NET ZERO CITIES

EU MISSION PLATFORM | CLIMATE NEUTRAL AND SMART CITIES

Climate City Contract

2030 Climate Neutrality Action Plan

2030 Climate Neutrality Action Plan of the City of Prato

comune di PRATO

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Table of Contents

Summary

An abstract **summarizes the content** of the 2030 Climate Neutrality Action Plan (Action Plan) that is developed jointly by local authorities, local businesses and other stakeholders.

Textual element

List of figures

The list of figures **identifies the titles and locations** (page numbers) of **all visual elements:** figures, drawings, photos, maps, etc. used in the Action Plan.

Figure №	Figure title	Page №
Figure 1	…	…

List of tables

The list of tables **identifies the titles and locations** (page numbers) of **all tables** used in the Action Plan.

Table №	Table title	Page №
Table 1	…	…

Abbreviations and acronyms

The list of abbreviations and acronyms **identifies the abbreviations** (a shortened form of a word used in place of the full word) **and acronyms** (a word formed from the first letters of each of the words in a phrase of name) used in the Action Plan.

Abbreviations and acronyms	Definition
…	…

1 Introduction

The introduction should outline the local policy context in which the Action Plan is being developed and describe the gap it is addressing in broad terms.

Given Prato's desire to achieve climate neutrality by 2030, the process of identifying the Plan's guidelines was based on the analysis of existing planning instruments, evidence from thematic tables and the main national plans (NRRP, PNIEC).
On the basis of considerations regarding planning instruments, existing objectives at local and national level, and in the light of the technologies currently available (and already ripe for possible use in the short and medium term), initial general guidelines are proposed that can guide the specific actions that will be implemented:

- Decarbonising thermal and electrical consumption by reducing demand and increasing the efficiency of plant systems in the civil and industrial sectors;
- Promoting the electrification of consumption in the civil sector and in mobility;
- Increasing local energy production from renewable sources (mainly photovoltaics);
- Encourage the consumption of energy from renewable sources, not necessarily produced locally;
- Disseminating conscious consumption models, aimed at reducing the use of raw materials and their reuse and recycling;
- Promoting alternative and low-impact forms of mobility;
- Increase carbon storage/absorption.

Furthermore, in order to make the analysis as comprehensive as possible, all areas of intervention are considered (i.e, buildings, transport, waste, IPPU and AFOLU) and all categories of greenhouse gases.
For years, the international and continental arena has recognised that urban areas play a crucial role in defining sustainable economic, social and cultural development strategies for the future of the planet. United Nations programmes such as the 2030 Agenda for Sustainable Development, together with European programmes such as the Urban Agenda for Europe, Urban Innovative Actions (UIA), Urbact and the Urban Development Network (UDN), demonstrate the importance of urban areas in international medium- and long-term planning.
The European Green Deal, adopted in 2020, aims to achieve zero net CO2 emissions by 2050, thus promoting sustainable development based on the moderate use of natural resources. In the context of the COVID-19 pandemic, the Next Generation EU programme was launched to address the environmental transition, ensure social and economic resilience, and promote digitisation and innovation in order to foster sustainable and economic recovery.
In Italy, it is fundamental that the theme of urban areas be at the center of the national political debate, promoting the planning of a National Urban Agenda that represents the complete framework of a new political and cultural season, integrating the theme of urban policies into the national strategies. In this context, the Region of Tuscany's Structural Planning can play a leading role in the integration of local strategies in the international and continental context, coordinating with the regional sustainable development programmes and creating a harmonious balance between metropolitan, urban and inland areas. The set of Structural Plans can therefore constitute a mosaic of Urban Agendas for the local sustainable development strategies of the Tuscany Region, within the national and European context.
The Municipal Council Resolution 89/2015, entitled '*Programmatic guidelines for the formation of the variant to the Structural Plan and the new Operational Plan of the Municipality of Prato*', constitutes a document of strategic importance that has guided the action of the Municipal Administration in the definition of urban policies and has played a significant role in inserting the vision of the city within

planning tool Introduction - textual element international and continental, such as the 2030 Agenda for Sustainable Development and the Urban Agenda for Europe. This ensured adequate coherence with global strategies.
The active participation of the Municipality of Prato in the partnership on Circular Economy, within the Urban Agenda for Europe, contributed to raise awareness on the role of the city and its peculiarities in relation to sustainable development strategies at regional, national and European level. This document was presented as the Urban Agenda for Prato, a visionary tool outlining medium- and long-term strategies for achieving sustainable development of the city and promoting the integration of different municipal planning tools. The adoption of this tool entailed a constant involvement of the community and favoured the active participation of citizens and stakeholders in the strategic and policy choices of the municipal administration.

Participatory processes and co-design processes were initiated to involve the community in order to outline a shared vision and define collaborative processes for its effective realisation. In particular, the co-design process was conceived and implemented in line with the systemic approach of Net Zero Cities, which suggests acting collaboratively, seeking first to understand the interdependencies between the actors in the area and their actions, in order to explicate the barriers that hinder change and to co-create a portfolio of actions (i.e., co-design a portfolio) that support the overcoming of those same barriers. Aware of finding ourselves within an exploratory path and strongly dependent on the reference context (the city of Prato), we worked on a process that would allow us to create synergies between public administration, stakeholders and citizenship in order to concretely involve the collective intelligences along a transition path that will lead us to the implementation of meaningful impact pathways towards climate neutrality.

The city of Prato adopted its Urban Agenda in 2015, which contains the overall vision and strategies for sustainable local development that guided decisions on urban and territorial policies. In 2020, through the Single Programming Document (DUP), the city administration aligned its planning tool with the 17 Sustainable Development Goals (SDGs). These aim to harmonise the city's vision in a manner consistent with international and European planning documents, in order to contribute to the achievement and monitoring of the Sustainable Development Goals (SDGs), as well as to exploit related opportunities for the city's socio-economic sectors.

The Structural Plan of the Municipality of Prato, known as Prato Urban Agenda 2050, is conceived as the medium- and long-term vision tool for the city, in tune with the new European planning instruments. It defines the coordination of urban policies and the strategic positioning of the city in the global competition between territories. Prato's social, economic and cultural peculiarities are considered and integrated in the current major international and European programmes, recognising them as central elements for a sustainable development of the city.The involvement of all citizens and stakeholders is guaranteed through participation and co-designing strategies, in order to share the vision and define the actions necessary to achieve it. The project outlines areas of action and strategies related to development.

The Prato 2050 Urban Agenda aims to provide a comprehensive blueprint for the city, identifying Prato's strategic role at regional and sustainable urban level, in line with international goals such as the 2030 Agenda for Sustainable Development and the Urban Agenda for Europe. It also positions itself in relation to new ongoing programmes, such as the European Green Deal and Next Generation Europe, in order to nominate the city's actions and projects for future regional, national and European funding. Moreover, it is based on an in-depth analysis of the city's specificities and places it in the global competition between territories; it focuses on innovation, digitalisation and new economic models based on the environment and the social; it promotes a narrative of the city as the contemporary centre of Tuscany and develops actions to support its historical, economic and cultural

heritage, with special attention to the sustainable and circular textile district.The municipal administration of Prato has placed green transition at the centre of its programme, in line with the climate target to reduce emissions by 55% by 2030. This commitment will be reflected in the first European Climate Act, due to be adopted by the end of the year, together with NextGenerationEU and the Budget 2021-2027. The plans adopted must include appropriate measures to achieve European targets on renewable energy, energy efficiency, pollution control, sustainable mobility, protection of biodiversity and support for the transition to food systems and a circular economy, leaving no citizen behind.
The integration of planning actions (e.g., the Municipality's Operational Plan (MOP), the Sustainable Energy Action Plan (SEAP), the Sustainable urban mobility planning (SUMP) and the Smart City Plan, was promoted to ensure the centrality of environmental issues in urban policies and to realise the vision of Prato as a Green City.
In general, Prato has promoted a holistic view of environmental issues, culminating in the Prato Green Deal, with the aim of promoting healthy lifestyles, improving people's physical health, strengthening social relations and developing the ability to care for the quality of collective living spaces.
Among the various programmes to promote a healthy and sustainable lifestyle, the Riversibility project is innovative because it envisages the creation of a Bisenzio river park with new sports facilities, spaces for aggregation, and new buildings for associations, in accordance with the WHO Toronto Charter. Another programme, known as '100 Piazze', envisages the realisation of widespread green public spaces in the city's identity places. In addition, a project is underway to bury the Declassata, the city's most important east-west traffic artery, in order to create a new urban park. Within this urban, environmental and sustainable mobility planning perspective, coordinated actions are being developed in the field of health planning, in synergy with the innovative management models of the Smart City Plan. These efforts place citizens' health at the centre of urban policy decisions.
The Municipality's Operational Plan (MOP) redefined the paradigms of the city, considering it as an interconnected system of green and natural areas surrounding built-up areas, following the approach of landscape urbanism. This approach has placed Prato at the centre of international discussions on urban resilience. Furthermore, the Action Plan for Urban Forestry introduced the role of nature in urban areas to promote citizens' health.

In 2019, the City of Prato obtained funding through the Urban Innovative Actions programme for the Prato Urban Jungle (PUJ) project, which is part of the Prato Green Deal. PUJ aims to transform three densely populated districts of the city into environmentally active areas using nature-based solutions. The project is based on the collection of environmental data via sensors and the creation of a digital twin of the neighborhoods to constantly monitor environmental data and assess the impacts of the projects.
In addition to these interventions, the administration has promoted overall coordination and action with stakeholders through the SEAP. This plan includes interventions in public and private buildings, discussion tables with stakeholders, and environmental education activities to reduce greenhouse gas emissions in the city. The main objectives of the SEAP are the energy requalification of public assets, the reduction of consumption and increase in energy efficiency in private sectors, the increase in the production and use of renewable energy, and the promotion of a culture of energy saving and rational use of energy among citizens, operators and businesses in the area.
The Prato Green Deal also developed an overall mobility strategy through the PUMS, which positioned the city of Prato as a national benchmark for sustainable mobility policies. The PUMS aims to satisfy people's mobility needs to improve their quality of life in the medium and long term. The main objectives concern the promotion of sustainable mobility, satisfying the different mobility needs of residents, businesses and users, improving accessibility to the city's key destinations, safety, health, accessibility and information for all, reducing air and noise pollution, reducing air pollutant

emissions and energy consumption, optimising the transport of people and goods to reduce costs and environmental impact, and improving the urban landscape for the benefit of citizens, the attractiveness and economy of the area.

Work Process

This section should list the working steps carried out, for example along the NZC Climate Transition Map, or related steps planned as well as outline timeline and milestones for future iterations for the continuous development of the Action Plan.

Work Process - combination of textual and visual elements

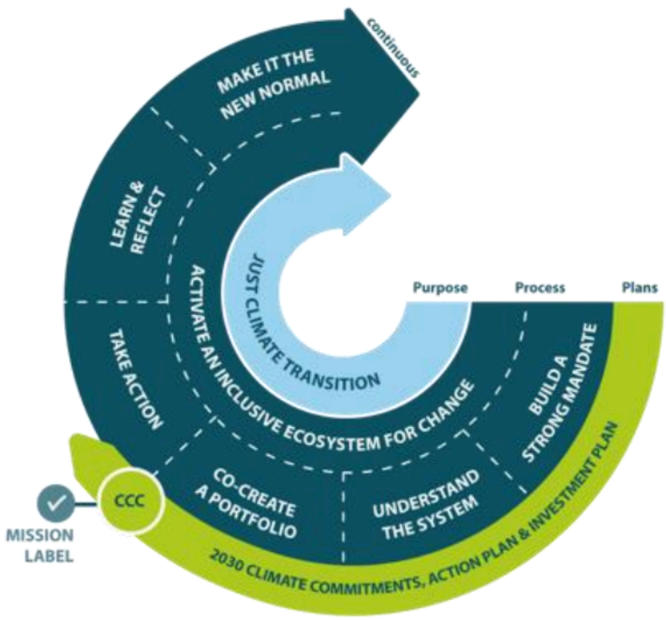


Figure 3: NZC Climate Transition Map

1. **Building a robust systemic approach**

The Municipality of Prato has adopted a systemic approach to accelerate decarbonisation actions, ensuring alignment between all investments and stakeholders required to achieve climate neutrality by 2030. The city's commitment to promoting change has remained unchanged, even in the face of changes in elected administrations. Concern about the climate crisis and the desire to put the environment at the centre of its strategies and operational plans have been translated by the Municipality of Prato into concrete actions of urban transformation. The Municipality adhered to the ambitious 2030 target through the Mission of the Cities, thus demonstrating its willingness to confirm its commitment and to translate it again into practical actions to tackle climate change.

The active involvement of the entire local ecosystem, including citizens, civic organisations, the media, and the public and private sector, is a key element. In order to facilitate meaningful collaboration, the Municipality of Prato has established a dedicated transition team that coordinates the different skills and perspectives from various disciplines within the city, involving representatives from the various sectors of Prato's society, in order to foster collaboration, innovation and joint investment. Specifically, the Municipality of Prato has designated a **dual governance** to address the 2030 climate neutrality challenge: an internal and an external one. Within the city government, a team has been set up to establish strategically strong relationships between key departments (e.g., energy, mobility, public buildings); specifically, a governance composed of the Mayor and the Councillors for the Environment, Mobility and Circular Economy and for Budget and Innovation has been envisaged, which will be supported by the Planning and Circular Economy Office as Technical Secretariat, and by a scientific coordination to be carried out by UNIFI DIDA/DAGRI, CNR IBE/INO.
By promoting the stipulation of a **memorandum of understanding (i.e., DGC no. 20 of 04/02/2022)** with the relevant figures for citizenship (e.g., trade associations, social partners, public and private bodies) the aim is to functionalise the planning and design of calls for proposals and financing opportunities that will arise in the context of the NRP. This protocol constitutes a coordination table formed by the subjects identified by the signatory parties, coordinated by the Municipality of Prato, which meets periodically, at least once every two months.
It is, therefore, an instrument facilitating dialogue between the municipal administration and the territory's stakeholders within the City Mission and also with higher levels of government (regional, national, European). At the moment, economic categories (Pistoia-Prato Chamber of Commerce, Confindustria Toscana Nord, CNA Toscana Centro, Confartigianato Prato, Confesercenti Prato, Confcommercio Prato, Confcooperative, LEGACOOP, CGIL Prato, CISL, UIL), participated companies (ALIA Servizi Ambientali, REVET, GIDA, Interporto della Toscana Centrale, Toscana Energie, ESTRA, Consiag, Autolinee Toscane), social partners (Società della Salute di Prato, USL Toscana Centro, Consulta del Terzo Settore), research bodies and universities (PIN - Polo Universitario Città di Prato, CNR, UNIFI, ENEA, ISPRA).

The Municipality of Prato actively participated in national mission platforms and networks between cities, including the **European Community Mission Platform** made available to cities selected in the Net Zero Cities call; where it shared its experiences and learnt from others, at the in order to improve their climate actions. These actions will help ensure a cross-sectoral commitment and concrete mobilisation of the resources needed to achieve the 2030 climate neutrality targets.

1. Analysis of the context of the Municipality of Prato and the status quo

By understanding the challenge from multiple perspectives and learning from past actions, the City of Prato has demonstrated valuable potential in accelerating the impact of climate efforts. The city has deepened its analysis of the territorial context and addressed the complex issues of climate change mitigation and adaptation, identifying barriers to the necessary changes.

The analysis of the context on which the Climate Neutrality Plan was defined was carried out through two phases. During the first, **the general framework was** analysed and elaborated through the analysis of the urban and territorial, social, natural and economic context. This was followed by a further mapping of the infrastructures in the area, the vehicle fleet and the status of renewable energy production plants.

During the second phase, the Municipality then conducted, in collaboration with **the University of Florence**, a co-design process that involved economic and social actors in order to understand the reference context, the criticalities, barriers to be overcome and opportunities to be exploited to achieve climate neutrality. The co-design process was conceived and implemented in line with the systemic approach of Net Zero Cities, which suggests acting in a collaborative manner; in a first phase (i.e. the listening phase), focus groups were organised, associating the various stakeholders in the area with the macro-themes on which the climate neutrality strategy is based (e.g. energy efficiency; sustainable mobility; circular economy; agriculture; land use and urban forestry). The objective was to identify the problems and a first category of barriers that hinder the change towards climate neutrality; from the reconstructed state of the art, all the material obtained was then reworked and analysed. This made it possible to derive an overall result that provides a better understanding of which actions have already been activated, whether there are opportunities for development and whether there are gaps, weaknesses or strengths. During the second phase of the participatory process, a selection of representative actors from the area was again convened to take part in the design of activities to support climate neutrality with respect to the four macro-themes identified.

2. National Plans and Prato Municipality Plans: Identification of Strategic Directions

The Municipality of Prato collaborated with all the city's stakeholders to aggregate information and data; a fundamental action to create an overview and shared understanding of the scale and scope of change required. Bringing together different perspectives, experiences and lessons learnt from existing climate strategies and efforts, the City identified gaps and interpreted consumption-related emissions on the ground as a consequence of an interconnected system. Existing climate policies, greenhouse gas emission reduction targets and progress to date were then analysed. This formed the basis for the formulation of a solid action and investment plan, based on the analysis of

the following: of the main National Plans, including the NRRP and the PNIEC; of the existing planning tools, specifically the Municipality's decarbonisation operational plans (e.g., PAES, Next Generation Prato, Agenda Urbana Prato 2050, PUMS, Prato Smart City) of the evidence that emerged from the thematic tables, and of the technical studies of the Municipality of Prato carried out in collaboration with CNR and the company Iridra.
The Municipality of Prato then conducted an **inventory of greenhouse gas emissions,** assessing the social, economic and environmental drivers to ensure the technical and financial feasibility of the transition to climate neutrality. In addition to monitoring scope 1 and 2 emissions, the Municipality also identified and collected data on scope 3 emissions. The year identified for updating the emissions inventory is 2019. As far as emissions are concerned, a total of **915,150.19** tonnes of CO_2 were emitted in the Municipality of Prato as of 2019. 31.86% of emissions are associated with private and commercial transport, followed by the residential sector (24.53%) and non-ETS industries (23.97%). The tertiary sector accounts for 15.19%, waste for 2.64% and public buildings for 0.60%. This is followed by public lighting with 0.45%, the agriculture sector with 0.42% and the municipal fleet with less than 0.01%.
In addition, future scenarios were simulated that outlined the possible starting points for urban transformation, illustrating, with different levels of detail, the alternatives that could be implemented at the local level; synergies, co-benefits, risks and trade-offs arising from each intervention were identified. The scenarios illustrated how the various sectors included in urban change (e.g., technology, governance, policy and regulation, finance, business models, culture, citizen participation and social innovation) can contribute to closing the gaps and barriers previously identified.

3. Definition of strategic directions and actions for the Climate Neutrality Plan

The Municipality of Prato has brought together efforts from various departmental structures and stakeholders to create a coherent portfolio of interventions. It comprises a series of mutually reinforcing synergetic initiatives that strengthen the connections between the various actors involved in the planning and implementation process. Specifically, interviews were conducted with the contact persons of the mobility, town planning and energy offices, with some public and private companies and start-ups in the area. This phase was followed by the sending of data collection forms to obtain proposals for decarbonisation actions already implemented (from the year of the inventory to date) and those planned for the future.
On the basis of considerations about existing planning tools and objectives at local and national level, the Municipality of Prato has identified the **strategic directions** to follow in order to reach the 2030 climate objective; to achieve this objective, a framework of integrated actions has been outlined. Firstly, the decarbonisation of thermal and electrical consumption in the civil and industrial sectors was envisaged. This was achieved by reducing energy demand and increasing the efficiency of plant systems. In parallel, the electrification of consumption in both the civil and mobility sectors was promoted, for example by encouraging the adoption of heat pump air conditioning systems, electric vehicles and low-impact transport solutions. In order to reduce dependence on traditional energy sources, local energy production from renewable sources was increased, mainly through the implementation of photovoltaic systems. However, the objective was not limited to local production, but the consumption of energy from renewable sources was also encouraged, regardless of their geographical origin. In this context, it was crucial to promote conscious consumption patterns aimed at reducing the use of raw materials and their reuse and recycling. Finally, to offset residual emissions and contribute to carbon absorption, the focus was on increasing carbon storage and the adoption of absorption practices. By integrating these actions, the Municipality of Prato has committed to the ambitious goal of climate neutrality by 2030.

Once the actions to be implemented were identified, **the impacts** in terms of reducing thermal and electrical consumption and related emissions were **estimated, the timeframe for** implementing the actions, the **targets** to be achieved, and the **indicators** to monitor progress. Positive effects on areas such as health, the economy, resource management and social inclusion were also assessed; this evaluation made it possible to prioritise certain actions and select the most useful impact indicators for monitoring. An **economic-financial analysis** was then carried out in order to understand the economic resources needed to implement the actions on the basis of the Municipality's budget availability and the economic instruments to be adopted (e.g. incentives and financing).

4. **Implementation of the plan**

The Municipality of Prato will promote and communicate the portfolio of actions to stakeholders, citizens and society at large. This communication will generate a proactive impulse and strengthen the local ecosystem, contributing to the realisation of the portfolio's actions over time. This will lead to profound changes in the mindsets, interactions and involvement of stakeholders with respect to the climate neutrality goal. In implementing the portfolio, the Municipality of Prato will involve local governments (Region and Province), public or utility companies, large business organisations, SMEs, households, residents and communities. For the implementation of actions, it will be crucial to establish strong connections and a shared understanding of priorities among stakeholders, where the focus will be on inclusion, intersectionality and social justice to ensure an equitable transition**.** The City of Prato's transition team will coordinate implementation between different organisations and groups, creating opportunities for synergies and benefits across the city.

5. **Monitoring and adaptation of the plan**

During the progress monitoring phase, the Municipality of Prato will assess how actions contribute to the achievement of climate neutrality goals. A strong focus will be placed on the data and responsibilities of each stakeholder, so that the learning process during monitoring is continuous. It will be important to observe early signs in the results that indicate that progress is headed in the right direction. The objective will not only be to evaluate the results of actions, but also to understand the complementary changes needed to be successful, such as changes in policy, regulation and behaviour. The Municipality of Prato will use a set of quantitative indicators to monitor the different actions in the portfolio but value will also be placed on qualitative signs of change (e.g., raising awareness of environmental issues among citizens) in order to foster a shared understanding of the changes taking place and facilitate the ecological transition process itself. During the monitoring phase, solid evidence and knowledge about the efficiency of actions and their implementation in different urban contexts and critical emission domains will be constantly learnt from the data.
In addition, an **adaptive approach** will be adopted for portfolio actions and objectives. Continuous work will be done to adapt actions and objectives to the changing urban context and new stakeholder insights, allowing for modifications and improvements when necessary. The logic of the implemented strategies will also be frequently updated in order to adjust the trajectory towards optimal results and a positive overall effect. In the long term, the effort supported by the Municipality of Prato may be used as a reference point by other municipalities and cities to also embark on a path towards climate neutrality.

PHASE	ACTIVITIES	2023									2024-25	2026-27	2028-29	2030
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT				
Construction of a solid mandate	Establishment of an internal governance team with a control room made up of the Mayor and Councillors, supported by scientific coordination	M1												
	Creation of a memorandum of understanding with stakeholders of particular significance for the city community	M2												
	Participation in meetings proposed by the Mission Platform of the European Community	M3												
Analysis of the context of the Municipality of Prato	Co-design path which involved economic and social actors from the Municipality of Prato in collaboration with the University of Florence		M4											

Analysis of the status quo and current strategic directions	Emissions Inventory of the Municipality of Prato					M5								
	Analysis of National Strategic Plans		M6											
	Analysis of Prato's Operational Plans		M7											
Definition of strategic directions and actions for the Climate Neutrality Plan	Collection of contributions for decarbonisation from the representatives of the Mobility, Urban Planning, Energy offices and with some local companies and start-ups						M8							
	Identification of the strategic directions to follow to achieve the objective of climate neutrality by 2030				M9									
	Declination of strategic directions into actions						M10							
	Estimation of impacts in terms of reduction of energy consumption and emissions and initial cost evaluation						M11							
	Economic-financial analysis									M12				

Implementation of the plan	Mobilization of resources and actors for the implementation of the plan													
Monitoring and adaptation of the plan	Monitoring and analysis of actions through indicators										M13	M14	M15	M16
	Adaptation of actions and objectives based on results										M17	M18	M19	M20
	Sharing results											M21		M22

MILESTONE	
M1	Establishment of a multidisciplinary team capable of coordinating the different competences required to manage the Climate Neutrality Plan
M2	Activation of a facilitating tool for dialogue between the municipal administration and local stakeholders
M3	Comparison and learning to improve one's own decarbonisation actions
M4	Understanding the reference context, critical issues, barriers to be overcome and opportunities to be exploited to achieve the climate neutrality.
M5	Understanding the baseline scenario in terms of emissions and the most impactful sectors
M6	Understanding the future scenarios identified by the national plans for the definition of the strategic lines of the Municipality of Prato
M7	Understanding the identified future scenarios of Prato's operational plans and the city's shortcomings in achieving climate neutrality
M8	Definition of decarbonisation actions proposed by the Municipality within the sectors in the Plan
M9	Understanding the strategic directions to be followed
M11	Prioritisation of actions, in terms of economic resources and timing, based on quantification of impacts
M12	Understanding the contribution of economic resources necessary for the implementation of the interventions based on the budget availability of the Municipality and the instruments to be adopted
M13/ M20	Survey the status of implementation of actions and their impacts in order to adapt them to changes in the context and to allocate efficient use of economic resources (Monitoring at two-yearly adaptation)
M21/ M22	Dissemination of awareness among stakeholders regarding the progress of the Plan

2 Part A – Current State of Climate Action

Part A "Current State of Climate Action" describes the point of departure of the city towards climate neutrality, including commitments and strategies of key local businesses, and informs the subsequent modules and the outlined pathways to accelerated climate action.

Inquadramento generale

Contesto urbano – territoriale

The city of Prato is one of the capital municipalities of central Tuscany. The territory of its province comprises 65 municipalities (Cantagallo, Vaiano, Vernio, Montemurlo, Poggio a Caiano and Carmignano) and the municipal borders touch Vaiano to the north, Montemurlo, Agliana and Quarrata to the west, Poggio a Caiano and Carmignano to the south and Calenzano and Campi Bisenzio to the east. Its extension measures 97,5697.35 ^{km2} and the territory is located, according to the ISTAT classification, in the altitude zone of the internal hills. The demographic size of the Municipality of Prato corresponds to 196,277 inhabitants for an average density of about 2.000 inhabitants per km2.

Figure 1 The territory of Prato. Source: Operational Plan online

Prato is one of the largest textile and fashion districts in Europe and its territorial conformation is closely linked to the dynamics of industrial development. In particular, in Prato the urban and industrial fabric develop in a functional mix relationship in the core of the city, while along the southern axis distinct, albeit close, industrial nuclei are more localised than residential districts. These are the reasons for the scarcity of continuous urban fabric in the Corine Land Cover data (table 1).

Despite the availability of green areas, which are mainly developed in the belt areas, the agricultural-rural vocation is weak in Prato. The vast flat area to the south-southwest of the city is characterised by the widespread presence of permanent meadows and arable land and, above all, cereal cultivation. This area of the city is also home to a large park of about 300 hectares that is mostly used for leisure time activities. Nevertheless, the Municipality of Prato boasts widespread woodland in the northern hilly area, which is also associated with olive-growing activities.

It is this physical structure of the territory that explains the city's relatively low urbanisation, whereby urban functions absorb about 33% of its surface area (3,236 ha of land, 2021 data). The land cover classes of the Corine Land Cover dimension this territorial profile of the Municipality of Prato more precisely.

Land Cover Class -CLC	Surface area [ha]	%
Areas with evolving forest vegetation	365	4%
Areas with sparse vegetation	325	3%
Industrial or commercial areas	1.313	13%
Areas predominantly occupied by agricultural crops	85	1%
Sports and recreational areas	137	1%
Hardwood forests	624	6%
Mixed forests	695	7%
Olive groves	546	6%
Road and rail networks	94	1%
Arable land in non-irrigated areas	3.369	35%
Complex cropping systems	140	1%
Continuous urban fabric	129	1%
Discontinuous urban fabric	1.917	20%
Total	**9.739**	**100%**

Table 1 Land cover classes, according to Corine Land Cover [1].

According to Urban Index data [3], in fact, urban discontinuity is combined with an index of internal urban compactness higher than the national level (94%) and a very low housing dispersion index (about 1%). Population density is, therefore, very high: there are 1,986 inhabitants per ^{km2} in the Municipality of Prato, a density second only to that of Florence at the regional level (ISTAT, Risk map data 2018).

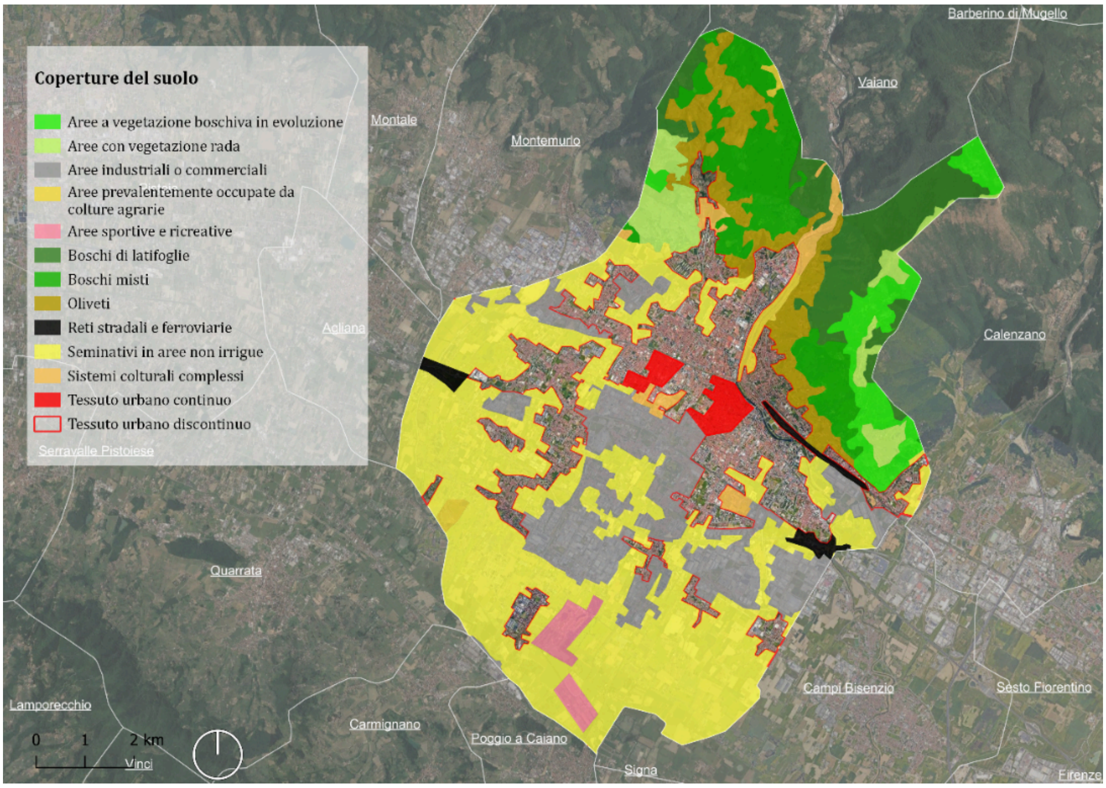


Figure 2 Land cover Source: QGis processing of Corine Land Cover data [1].

The rate of non-utilisation of dwellings is low, at 29%, and the average age of the building stock (as of 2011) is medium-high, at 31 years (the average age is calculated as the arithmetic mean of the ages of dwellings built after 1962, where age means the difference between the year of the census and the year the dwelling was built). According to the 2011 ISTAT census data, there are 35,515 buildings, of which 22,747 are residential. The minority is built of reinforced concrete (approximately 39.5 %), while 54.5 % is built of load-bearing masonry. 45.4 per cent were built before 1960, 43.7 per cent in the period from 1960 to 1990 and only 2 per cent are new buildings (built after 2005).

State of preservation of residential buildings	Percentage of the total
Excellent	46%
Good	47%
Mediocre	7%
Very bad	1%

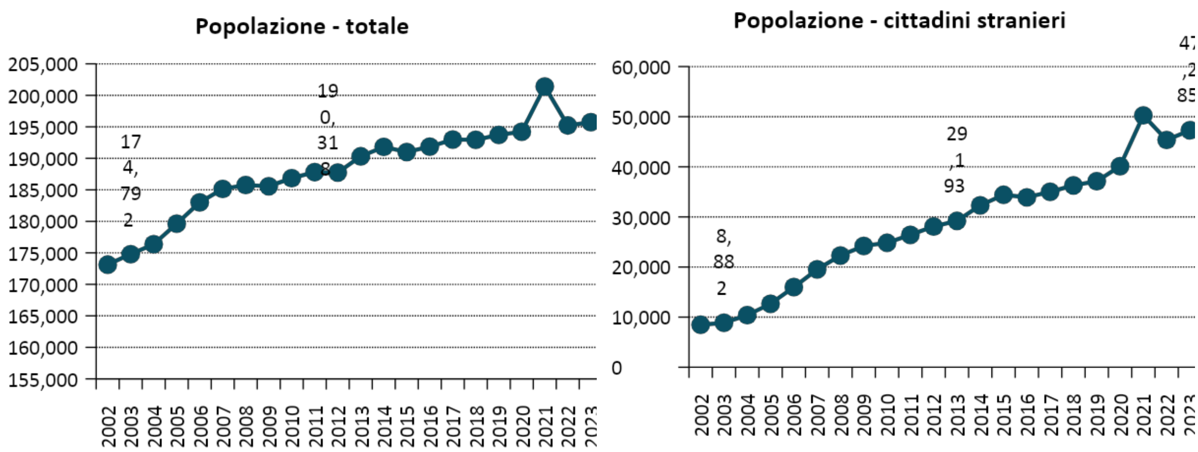
Table 2 - State of preservation of residential buildings.

The Municipal Operational Plan identifies 6 sites of archaeological interest, 5 of which are located within the urban area and one at Monte Lopi. [1]

Social context

Prato is the second city in Tuscany by population (after Florence, the regional capital) and the third in central Italy. For years the Municipality has held the national record for the highest incidence of foreign citizens out of the total: today, one in four inhabitants of Prato is not an Italian citizen.

Migratory flows from abroad explain the exceptional demographic growth trend of the city, which has gained more than 20,000 inhabitants in the last 20 years. The attraction of foreign nationals was very intense in the early 2000s, until 2008, after which the trend stabilised on variations of less than half a percentage point per year, while still remaining in positive territory today. The demographic historical series is interrupted by a few demographic peaks, the last in 2021 on the occasion of the ISTAT revision of the methodology for calculating the number of people in the territory.



Graph 1 - Resident population on 1 January. Municipality of Prato Source: ISTAT

Since the average number of members per family in Prato - as in most of Italy - is decreasing significantly, population growth is matched by a more than proportional increase in the number of families in the Municipality. Indeed, ISTAT data show that almost 81,000 families now live in Prato, compared to 75,000 in 2009 (+8%).

	Number of family	Average number of members per family
2009	74.616	2,49
2010	75.268	2,49
2011	75.611	2,43
2012	76.783	2,43
2013	76.661	2,48
2014	76.724	2,48
2015	76.911	2,47
2016	77.483	2,47
2017	77.842	2,47
2018	77.564	2,48
2019	77.997	2,47
2020	83.948	2,38
2021	80.824	2,40

Table 3 Households in Prato from 2009 to 2021 Source: ISTAT

From a demographic and social point of view Prato qualifies as a dynamic and young city compared to the rest of Tuscany and the national average. The continuous influx of population from abroad determines, in fact, a lower average age than the national average and that of all the provinces in the region (45.6 are the average years of Prato's population, against 47.8 in Tuscany and 46.4 in Italy). The demographic trend of the Italian population, on the other hand, follows the profile of the other territories: it is not younger and has a structurally negative 'natural' demographic balance (deaths are higher than births).

The main demographic indicators make it possible to grasp the demographic fragility to which the city of Prato is also exposed, despite the mitigating effect of immigration. The indicators are traditionally based on the ratios between three age classes: that of 'children and young people' (0-14 years), that of 'adults' of working age (15-64 years) and that of 'the elderly' (65 years and over). Almost 45,000 elderly people and less than 26,000 very young people live in Prato, compared to 126,400 people between 15 and 65 years of age, so the structural dependency index is 54% (population 0-14 and 65+ compared to 15-64 years of age) and the old-age dependency index is 34% (population 65+ compared to 15-64 years of age). Even the old age index, which measures the proportion of elderly (over 65 years) with respect to younger generations (under 15 years), confirms that in Prato there are 165 elderly people for every 100 young people (it is 225 on average in Tuscany, 193 in Italy).

	Municipality of Prato	Tuscany	Italy
Structural dependency ratio (0-14 + 64+) / 15-64	55%	61%	58%
Elderly dependency ratio 64+ / 15-64	35%	42%	38%
Old-age index 64+ / 0-14	179	225	193

Table 4 Age structure of the population of Prato compared to the Tuscan and Italian average.2022 Source: ISTAT

The 'fast' demography of immigration is also responsible for Prato's particular position in the official demographic forecasts (ISTAT): Prato is a city destined to grow and in the next few years will definitively exceed the threshold of 200,000 inhabitants, thus confirming its position as the exception in a national context that is increasingly old and poor in human resources. The pace of growth will, however, be dampened by the increased mortality of the Italian population, which will take in the full-bodied generations of baby boomers in the older age groups. Within Tuscany, the province of Prato represents the only territory destined to grow with both a ten-year (2032) and twenty-year (2042) perspective.

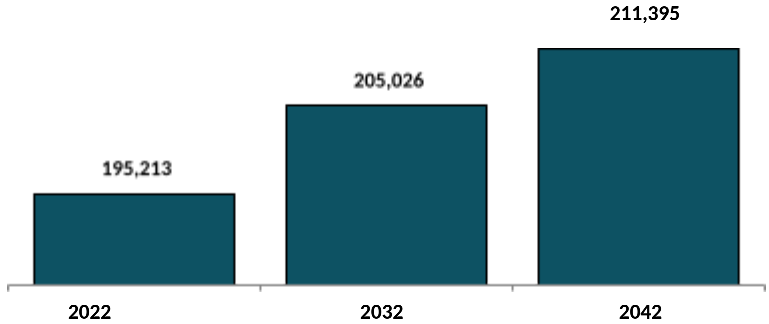


Figure 2. Population forecasts on 1 January 2032 and 2042, median scenario. Municipality of Prato Source: ISTAT

ISTAT has drawn up a synthetic index of social and material vulnerability (IVSM) to express the exposure of certain segments of the population to situations of risk, understood as the uncertainty of their social and economic condition. The IVSM index is constructed through the synthesis of seven indicators referring to the dimensions of social and material vulnerability considered most relevant for the formation of a national ranking of municipalities (incidence of the population without a qualification; incidence of families with 6 and more members incidence of single-parent families out of the total number of families; share of families composed only of the elderly (65 years and over) with at least one member over 80; incidence of the population in a condition of serious housing crowding; incidence of NEETs; incidence of families with children in which no one is employed or retired from work. This index marked for Prato a value of 100.9 points in 2011, fell to 97.4 points in 2014, but in the last update in 2018 it returned to the level of 100.7 points (the highest figure among Tuscany's capital municipalities).

Below are some useful indicators for assessing the social conditions of the Municipality, compiled at national level with data from the 2011 census [3]. The assessment compared to the national context is also reported. In summary, the Municipality of Prato appears to have a critical social condition, with a medium-high level of vulnerability.

Natural context

The territory of Prato has two different types of landscape: the valley floor plain and the terrigenous mountains.

	Landscape type	
	Valley floor (plain of Florence)	Terrigenous Mountains (Monti della Calvana and Monte Giovi)
Natural value	Very low	Medium
Cultural Value	High	Medium
Naturalistic and cultural value	Medium	Medium

Table 5. Source: ISPRA, Nature Map

The Municipality has a forest area of 2009 ha, which represents about **20 percent of the municipal territory.**

Forestry category	Surface area [ha]	% forest area
Areas with evolving forest vegetation	365	20%
Areas with sparse vegetation	325	15%
Hardwood forests	624	30%
Mixed forests	695	35%
Total	**2009**	**100%**

Table 6. Extent of forest categories in the Prato territory (from CLC model)

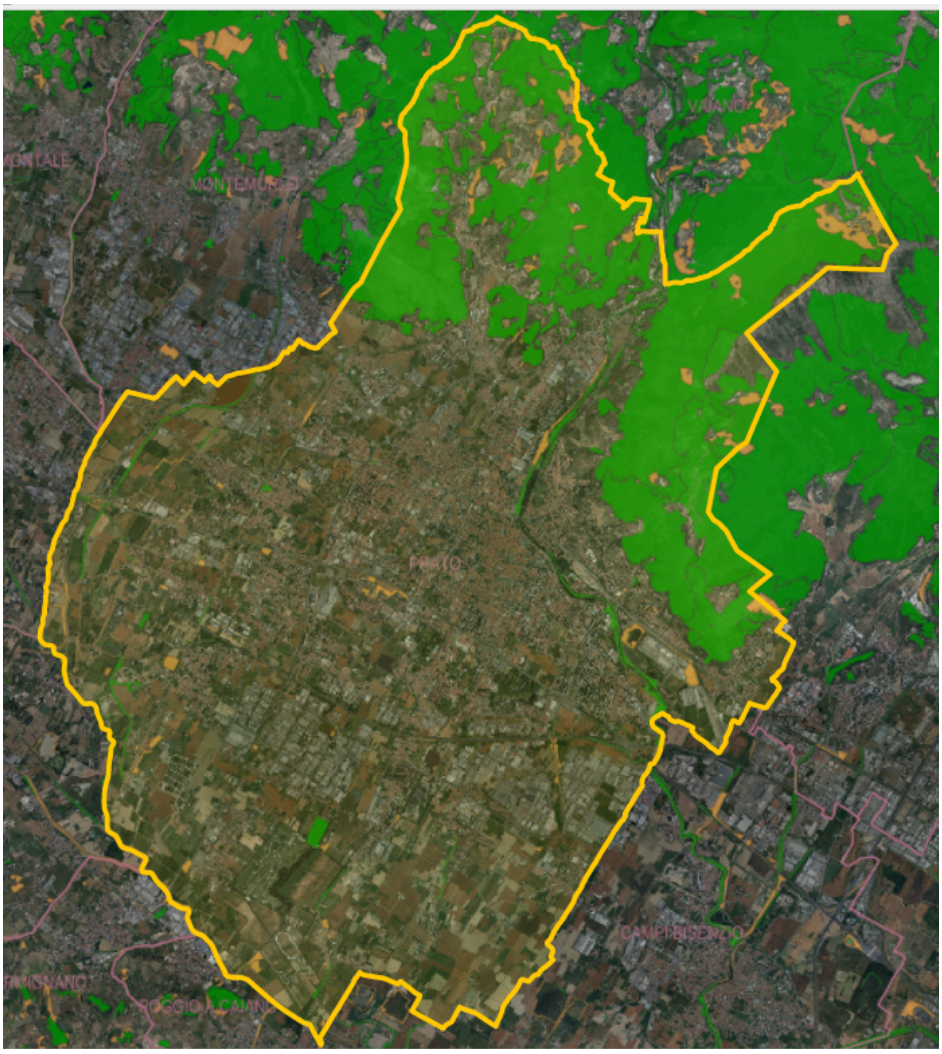


Figure 3. Wooded territories and semi-natural environments. Source: SITA Tuscany Region, land use and land cover

Economic Context

According to 2020 ISTAT data there are 32,710 local units and 110,965 employees. Consulting the Urban Index database [3] shows that with respect to economic capital Prato has a high index of economic dynamism. This is a synthetic index, elaborated at national level, calculated as the arithmetic mean of the standardised values of the following indicators:

- Agriculture = Agriculture employees / Total population *100
- Manufacturing = Manufacturing Workforce / Total Pop *100
- Trade = Trade employees / Total pop *100
- Services = Services employees / Total pop *100.

The territory has a compound average accommodation function rate compared to the nationalterritory of 3.3, calculated as the ratio of the number of hotel beds multiplied by 10,000 and the product of resident population and land area (^{km2}). The percentage of employees in APS and KIBS2 enterprises (economic sectors J, K and M) out of the total number of employees is high, at 10.37%, as is the proportion of APS and KIBS enterprises (economic sectors J, K and M) out of the total number of local units, at 16%.

Finally, the territory has an average high utilised agricultural area of 82.5%. The surface area agricultural total is about 64% of the municipal territory.

Infrastructural context

The Municipality of Prato is crossed by the regional road SR6 and provincial road infrastructure and is also connected through the Rome-Naples railway line. The mobility system in the territory of the Comune di Prato is currently structured on some main axes and corridors that connect it to the metropolitan, regional and national system. They can be grouped into:

- Main external road network, including the A11 motorway, the first and second Tangenziale Ovest (Western Bypass), the SR325 and a series of axes connecting with neighbouring municipalities;
- An internal main road network;
- A railway network, consisting of the FS Florence-Prato-Pistoia-Lucca-Viareggio line and the FS Prato-Bologna line (Direttissima), with three stations where regional and non-regional trains run (Prato Centrale);
- a network of cycle paths stretching some 50 km, connecting green areas within the Municipality with extensions outside it.

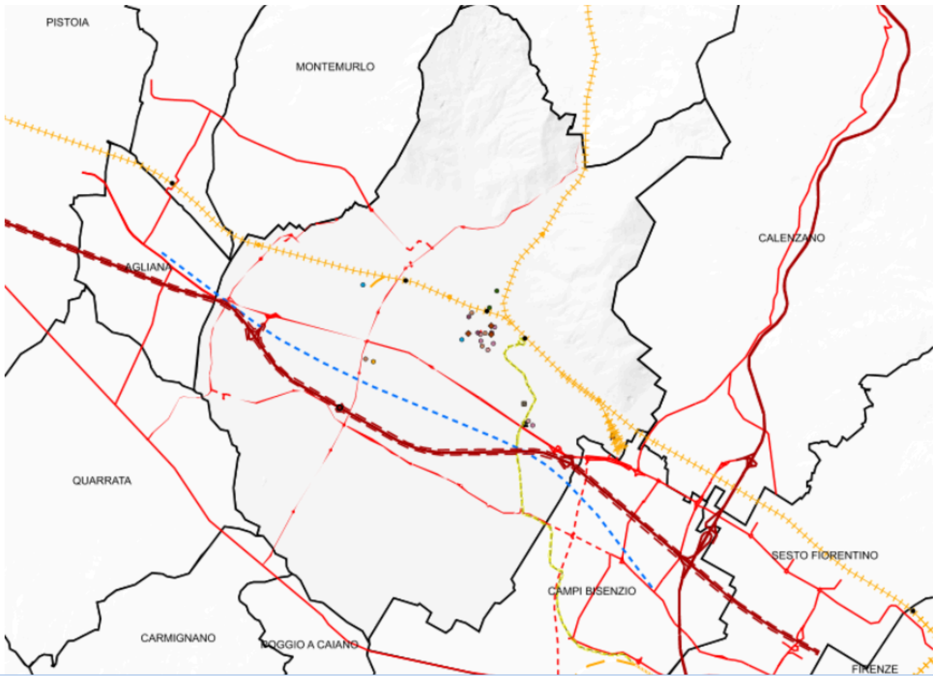


Figure 4. Infrastructure - mobility system.

The manager of the integrated water service for the Municipality of Prato is Publiacqua S.p.A, which manages the aqueduct and sewerage services in the municipal territory.

The main infrastructures related to water service are:

- Agna drinking water plant
- drinking water plant Falda 1
- drinking water plant (with biological denitrification process) at Falda 2 (Baciacavallo area)
- Saint Lucia plant
- central Le Bartoline
- adduction and distribution network totalling approximately 540 km
- connections to end users

The aqueduct network (adduction, distribution and connections) is in line with the needs of the Municipality of Prato, albeit old.

In the last decade, management strategies for the best use of water resources have been implemented thanks to investments aimed at reducing network losses (e.g. through districtisation, to reduce pressures) and enhancing groundwater abstraction through wells (both new and reactivated).

As for the sewerage network, which largely dates back to the 1970s-1980s, it is based on a system of collecting mixed water to the two purification plants of Baciacavallo (the main one) and Calice, managed by G.I.D.A. S.p.A..

The system consists of:

- a network of main collectors, some of which follow the routes of ancient gore
- a network of secondary collectors and a minor network that capillary transfers the mixed water to the main pipelines
- lifting stations
- spillways to discharge excess rainwater in the mixed sewer network into the environment

Prato's gore are a defining feature of the city's history, which has used them since ancient times to build on the resource of water as the engine of its development.

There are still some promiscuities between the networks and the gore system, which are, however, on a path of progressive separation with specific initiatives also shared between the service manager and the municipal administration.

Investments aimed at rationalising the sewerage system were also significant, sometimes aimed at overcoming the criticalities associated with the mixed system that also transfers stormwater overload to the sewerage system.

Prato's relationship with water is also represented by the persistence of innovative investments, which over the last 40 years have seen the realisation of one of the most important urban water reuse systems (civil and industrial):

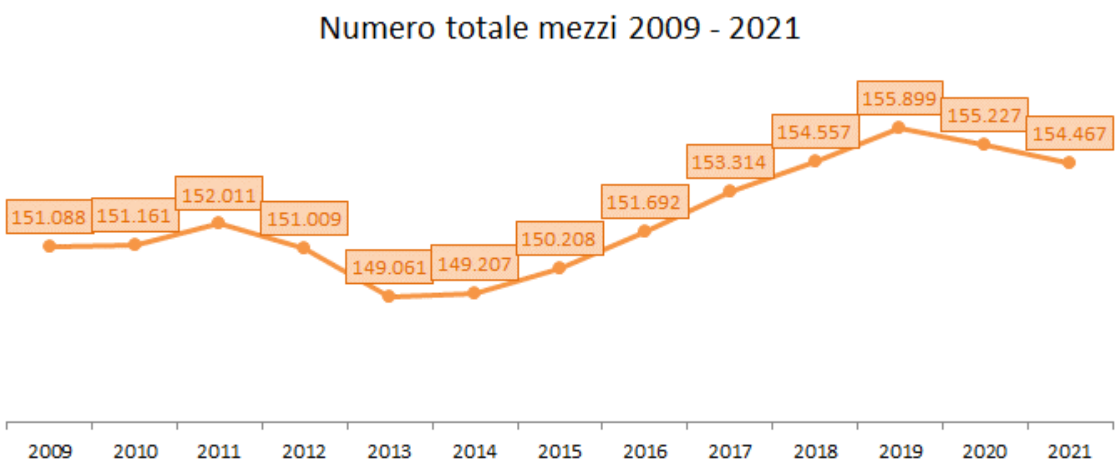
- of the industrial aqueduct, which uses water for reuse;

- of the industrial sewage system, which drains waste water from production activities via special pipes to the Baciacavallo purification plant, allowing it to be treated in a targeted manner and lightening the load on the civil network.

These infrastructures represent a fundamental action for Prato's textile production system, and open up new scenarios and future potential for further human-water relations, linked to new models of city management according to the principles of the circular economy.

Vehicle fleet

The trend of the municipal vehicle fleet and the detail on passenger cars alone are shown in the following graphs. It can be seen that over the period 2009 - 2021 (latest ACI data available) both the number of total vehicles and the number of cars grew by 2.2% (+3,379 units) and 2% (+2,339 units) respectively.



Graph 3. Development of the Prato vehicle fleet 2009-2021. (Source: ACI)

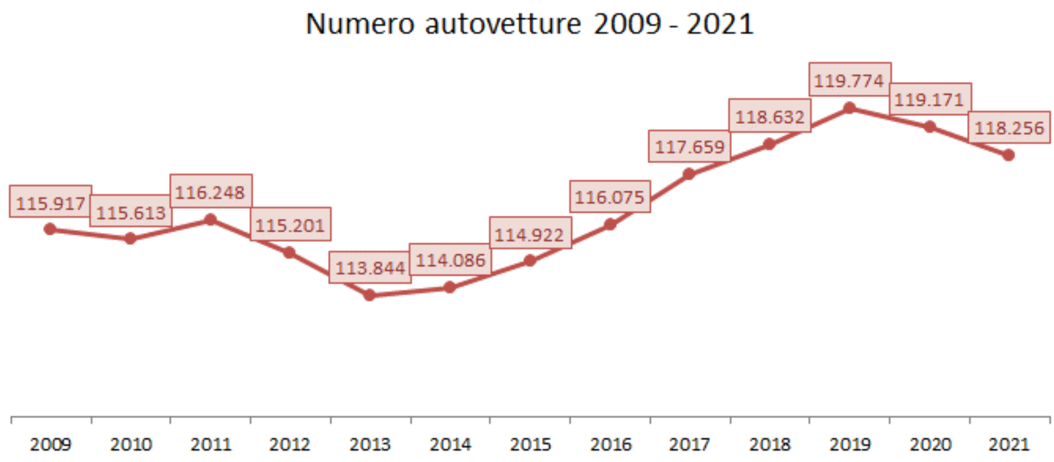
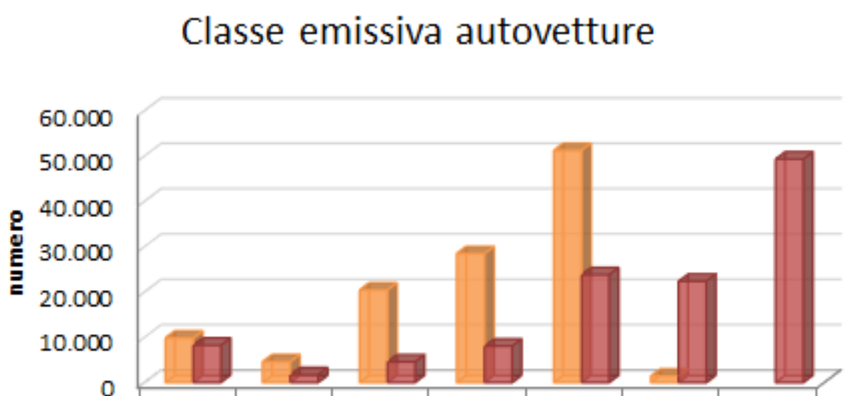


Chart 4. Development of Prato cars 2009-2021. (Source: ACI)

Focusing on the emission class of cars, on the one hand the number of the most polluting cars continues to decrease, on the other hand the number of Euro 6 cars increases. The graph shows the comparison between 2009 and 2021 (latest available ACI data)



	EURO 0	EURO 1	EURO 2	EURO 3	EURO 4	EURO 5	EURO 6
2009	9.828	4.590	20.406	28.430	51.202	1.424	
2021	8.245	1.707	4.564	8.020	23.776	22.353	49.292

Chart 5. Passenger cars by emission category - comparison between 2009 and 2021.

The following graph shows the breakdown of the vehicle fleet in the Municipality of Prato for 2021 according to the latest ACI data. Of the total, 88.5% is made up of cars and motorbikes; a further 8.8% is made up of goods transport lorries, while the remainder (2.7%) is made up of other types of vehicle (buses, special vehicles, special motorbikes, special and goods transport trailers and road tractors).

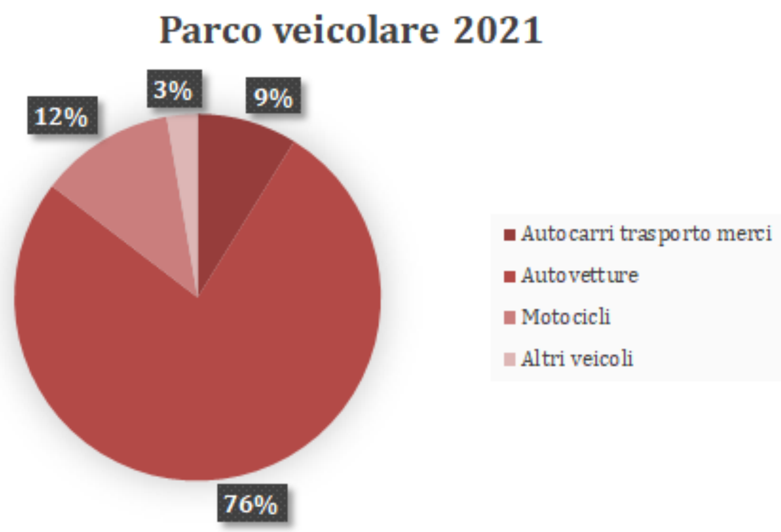


Chart 6. Breakdown of the vehicle fleet - 2021.

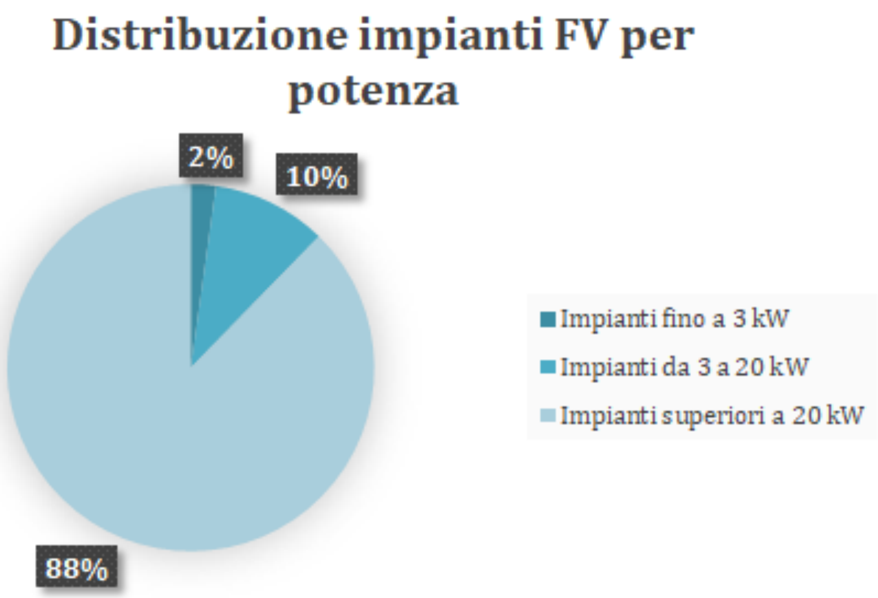
Status of RES - Renewable Energy Source

The Energy Services Manager (in italian GSE) makes available to users the Atlaimpianti portal, an interactive geographical atlas on which it is possible to consult the main data on the electricity and heat production plants that the GSE incentivises throughout Italy. Information on plants is broken down by type of source used or incentive mechanism. The data, extracted in March 2023, are updated to July 2021.

As far as photovoltaics are concerned, there are a total of 1,239 installations, 391 of which have an output of less than 3 kWp (with a total output of more than 1,038 kW), 595 installations with an output of between 3 and 20 kWp (with a total output of 4,764.1 kW) and 253 installations with an output of more than 20 kWp (with a total output of approximately 41,312.7 kW)

	Plants up to 3 kW	Plants from 3 a 20 kW	Plants beyond 20 kW	Total
Number	391	595	253	**1.239**
Power (kW)	1.038,5	4.764,1	41.312,7	**47.115,3**

Table 7. Photovoltaic systems installed in the Municipality of Prato.



Graph 7. Subdivision of systems by power classes. (Source: Atlaimpianti GSE)

Three other RES plants are installed in the Municipality of Prato: a 45 kW solid biomass plant and two hydroelectric plants of 100 kW and 110 kW.

BASELINE 2019

The approach used in this analysis to estimate emissions from energy consumption in the territory of the Municipality of Prato as of 2019 is the same as that used to define the BEI as of 2009 within the PAESC and refers to the following expression:

$E_i = A * FE_i$

where:

E_i = **emission of pollutant** 'i' (t/year), i.e. the quantity of pollutant 'i' (expressed generally in tonnes) generated and emitted into the atmosphere as a result of a given activity;

A = activity indicator, i.e. the parameter that best describes the activity that generates an emission, to which a pollutant can be associated, related to the unit of time (usually the year);

FE_i = **emission factor of pollutant i** (t of pollutant/unit of product, t of pollutant/unit of fuel consumed, etc.), i.e. the amount of pollutant released into the atmosphere for each unit of activity indicator.

The standard emission factors used in the analysis are given below, indicating the source reference.

FUEL TYPE	FE standard [tCO_2/MWh].	SOURCE
Petrol	0,249	ELCD – European Life Cycle Database
Automotive and heating oil	0,267	ELCD – European Life Cycle Database
Fuel oil	0,279	ELCD – European Life Cycle Database
LPG	0,227	ELCD – European Life Cycle Database
Natural gas	0,202	ELCD – European Life Cycle Database
Biofuels	0	ELCD – European Life Cycle Database
Electricity (national as of 2019)	0,415	Rapporto ISPRA 343/2021

Table 8. Standard emission factors (Source: SEAP Guidelines).

Local electricity production was also included in the 2019 EMI. Based on the criteria given in the SEAP Guidelines, a **local emission factor** was calculated **for electricity**. This factor 'values' energy produced from renewable sources and green energy purchased from the local authority in terms of CO_2 reduction, according to the following formula:

$$FE_{EE} = [(C_{EE} - PL_{EE} - CV) * FE_{NE} + CO_{2PL} + CO_{2CV}] / (C_{EE})$$

where:

EEC = Total Electricity Consumption

PLEE = local electricity production [MWhe].

CV = purchase of green/renewable electricity by local authorities [MWhe] FENE= emission factor of national or European electricity [t/MWhe].

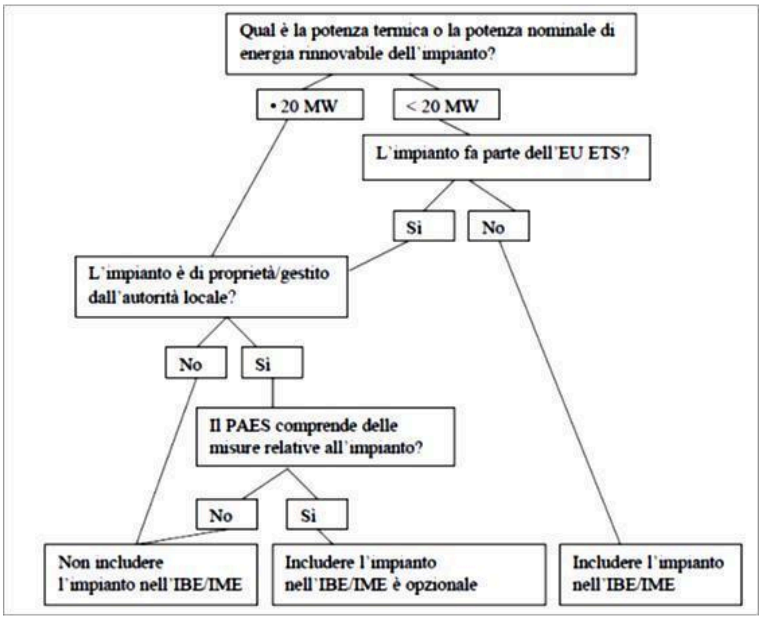
CO2PL = CO_2 emissions from local power generation [t].

CO2CV = CO_2 emissions from the production of certified green/renewable electricity purchased from local authorities [t].

All installations that meet the following criteria must be considered in the inventory:

- the installation/unit is not included in the European Emissions Trading Scheme (ETS);
- the plant/unit has an input thermal energy of less than or equal to 20 MW in the case of fossil fuels and biomass combustion plants, or less than or equal to 20 MWe nominal power in the case of other renewable energy plants (e.g. wind or solar).

The logic is that small plants respond to local electricity demand, while larger plants produce electricity. The diagram below can be used to determine the inclusion or non-inclusion of plants in the BEI.



.**Figure 5. Decision-making diagram to include local electricity production (Source: JRC Guidelines)**

The electricity production plants included in the EMI of the Municipality of Prato are shown in the table below.

Plant type	Locally produced electricity [MWh]	Total output [MWh]
PHotovoltaics	53.588 MWh	Estimated output 1.200 kWh/kWp
Hydroelectric	630 MWh	Estimated output 3.000 kWh/kWp

Table 9. Electricity production plants included in the EMI.

Based on the electrical output of photovoltaic systems**,** the **emission factor** was calculated **for electricity,** which is **0.385 t CO2/MWh**.

2.1 Module A-1 Greenhouse Gas Emissions Baseline Inventory

Module A-1 “Greenhouse Gas Emissions Baseline Inventory” should detail and describe the city’s latest GHG inventory to establish the emission baseline and to establish the emissions gap to 2030 climate neutrality according to the inventory specifications defined in the Cities Mission’s *Info Kit for Cities* and the process outlined in the Action Plan Guidance.

A-1.1: Final energy use by source sectors				
Base year	2019			
Unit	MWh/year			
	Scope 1	**Scope 2**	**Scope 3**	**Total**
Buildings				
Electricity		552.807,26		552.807,26
Natural Gas	736.788,06			736.788,06
Liquid Propane Gas	18.515,87			18.515,87
Diesel	26.831,71			26.831,71
Transport				
Electricity		340,16		340,16
Natural Gas	18.978,30			18.978,3
Liquid Propane Gas	29.030,93			29.030,93
Diesel	786.394,37			786.394,37
Gasoline	297.395,11			297.395,11
Biofuels	94.242,56			94.242,56
Waste				
Electricity		31.899,67		31.899,67
Natural Gas	21.368,74		24.157,06	45.525,80
Liquid Propane Gas	5,45			5,45
Diesel	7.678,03		2.480,09	10.158,11
Gasoline	18,09			18,09
Biofuel	669,23		215,66	884,89
Industrial Process and Product Use (IPPU)				
Electricity		257.747,09		257.747,09
Natural Gas	591.188,94			591.188,94
Fuel Oil	2.496,47			2.496,47
Agricultural, Forestry and Land Use (AFOLU)				
Electricity		3.457,22		3.457,22
Diesel	9.486,45			9.486,45
Biofuels	824,91			824,91
TOTAL	**2.641.913,22**	**846.251,41**	**26.852,81**	**3.515.017,43**

A-1.2: Emission factors applied						
(please specify for primary energy type and GHG emission factor according to methodology used)						
Unit: ton_{GHG}/MWh						
method used : IPCC						
Primary energy/ energy source	Carbon Dioxide (CO_2)	Methane (CH_4)	Nitrous Oxide (N_2O)	F-gasses (hydrofluorocarbons and perfluorocarbons)	Sulfur hexafluoride (SF_6)	Nitrogen trifluoride (NF_3)
Electricity	0,385					
Natural Gas	0,202					
Liquid Propane Gas	0,227					
Fuel Oil	0,279					
Diesel	0,267					
Gasoline	0,249					
Biofuels	0,000					

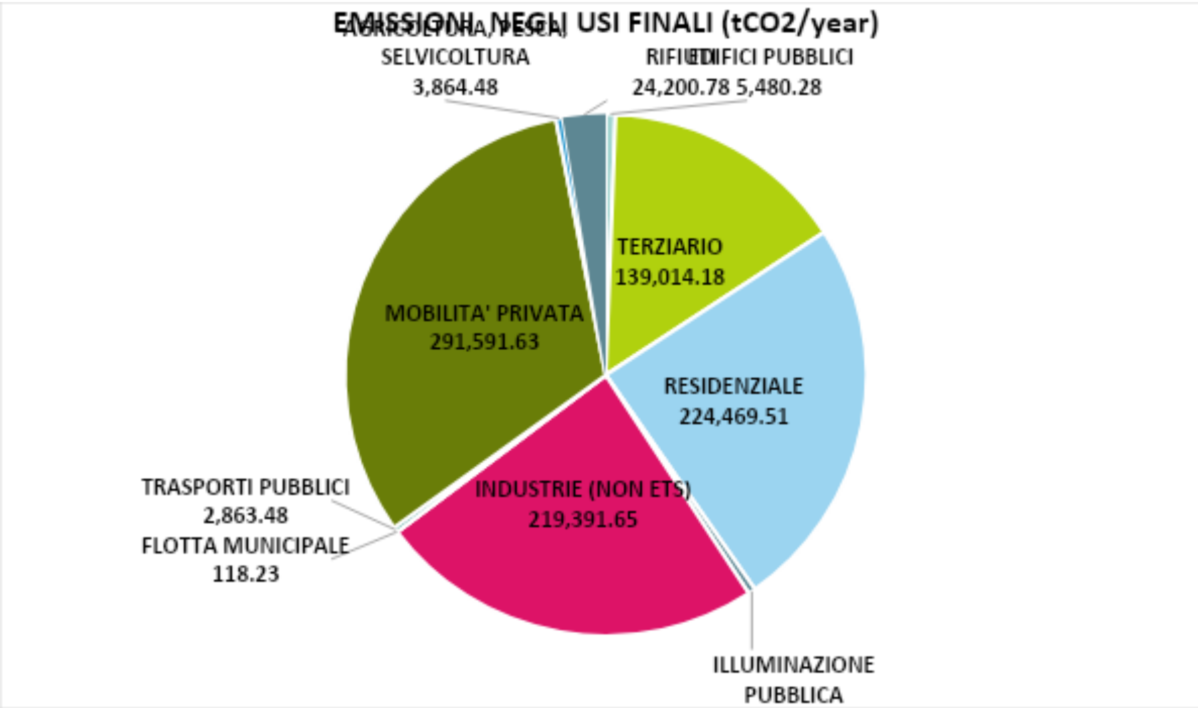
A-1.3: Activity by source sectors			
Base year		2019	
Unit		MWh/year	
	Scope 1	Scope 2	Scope 3
Buildings			
Edifici, attrezzature/impianti comunali	12.701,69	7.567,01	
Edifici, attrezzature/impianti terziari (non comunali)	48.273,89	335.526,37	
Edifici residenziali	721.160,06	198.923,72	
Illuminazione pubblica comunale	0,00	10.790,15	
Transport			
Parco auto comunale	513,40		
Trasporti pubblici	11.657,20		
Trasporti privati e commerciali	1.213.870,67	340,16	
Waste			
Edifici, attrezzature/impianti terziari (non comunali)	21.368,74	31.899,67	24.157,06
Trasporti privati e commerciali	8.370,78	0,00	2.695,75
Industrial Process and Product Use (IPPU)			
Industrie (escluse le industrie contemplate nel Sistema europeo di scambio delle quote di emissione – ETS)	593.685,41	257.747,09	

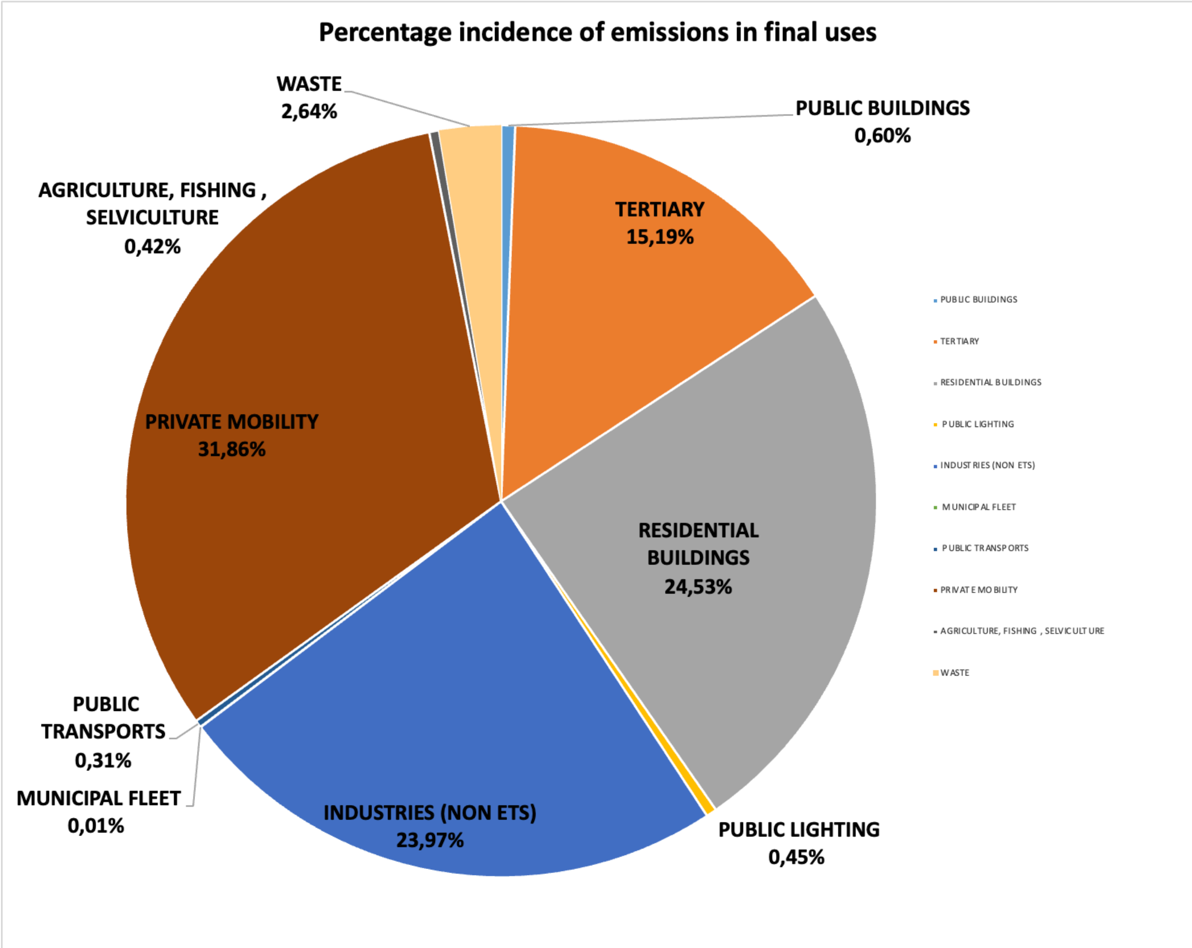
Agricultural, Forestry and Land Use (AFOLU)			
Agricoltura,pesca, silvicoltura	10.311,36	3.457,22	
TOTAL	**2.641.913,22**	**846.251,41**	**26.852,81**

A-1.4: GHG emissions by source sectors				
Base year	2019			
Unit	tCO2equivalent/year			
	Scope 1	Scope 2	Scope 3	Total
Buildings	160.198,36	212.921,59		373.119,95
Transport	294.442,32	131,02		294.573,33
Waste	6.372,26	12.286,61	5.541,91	24.200,78
Industrial Process and Product Use (IPPU)	120.116,68	99.274,97		219.391,65
Agricultural, Forestry and Land Use (AFOLU)	2.532,88	1.331,60		3.864,48
Total	**583.662,50**	**325.945,79**	**5.541,91**	**915.150,19**

A-1.5: Graphics and charts

(Please include visualisations of GHG emissions baseline)





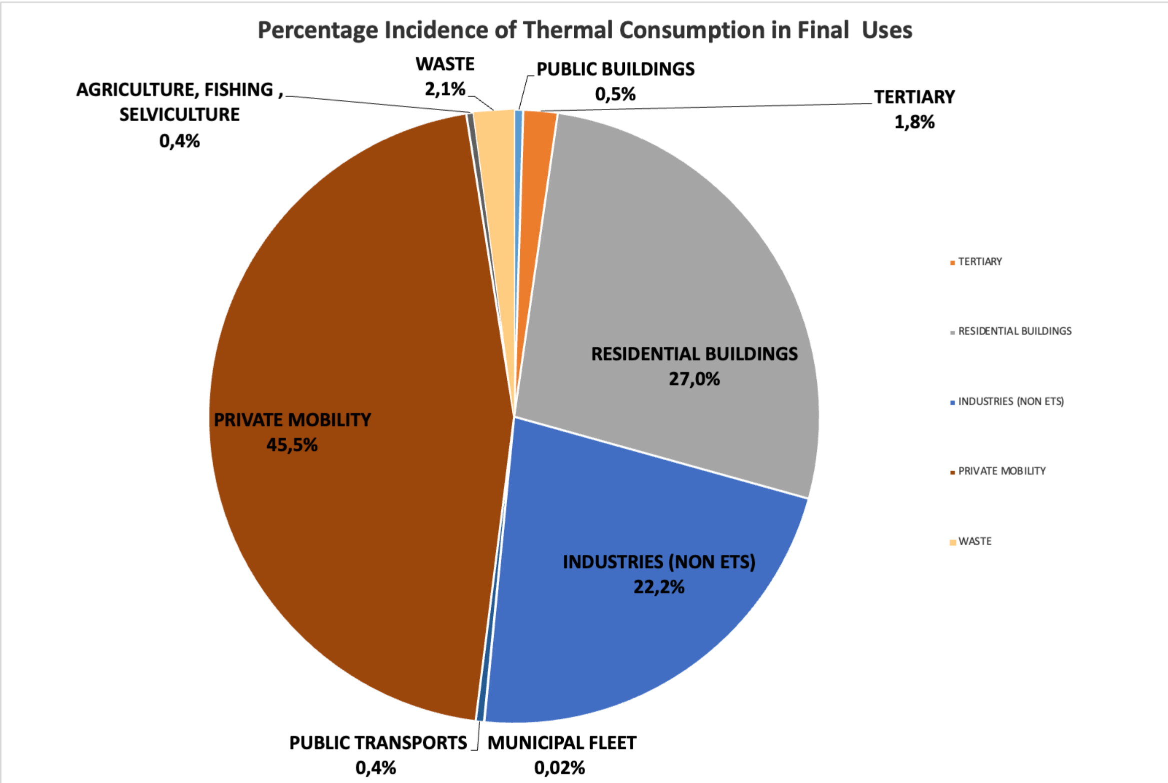
A-1.6: Description and assessment of GHG baseline inventory

The year identified for the baseline of the emissions inventory in the Municipality of Prato is 2019. The following table shows a summary overview of consumption, thermal and electrical, and emissions for the 2019 baseline in the various sectors considered.

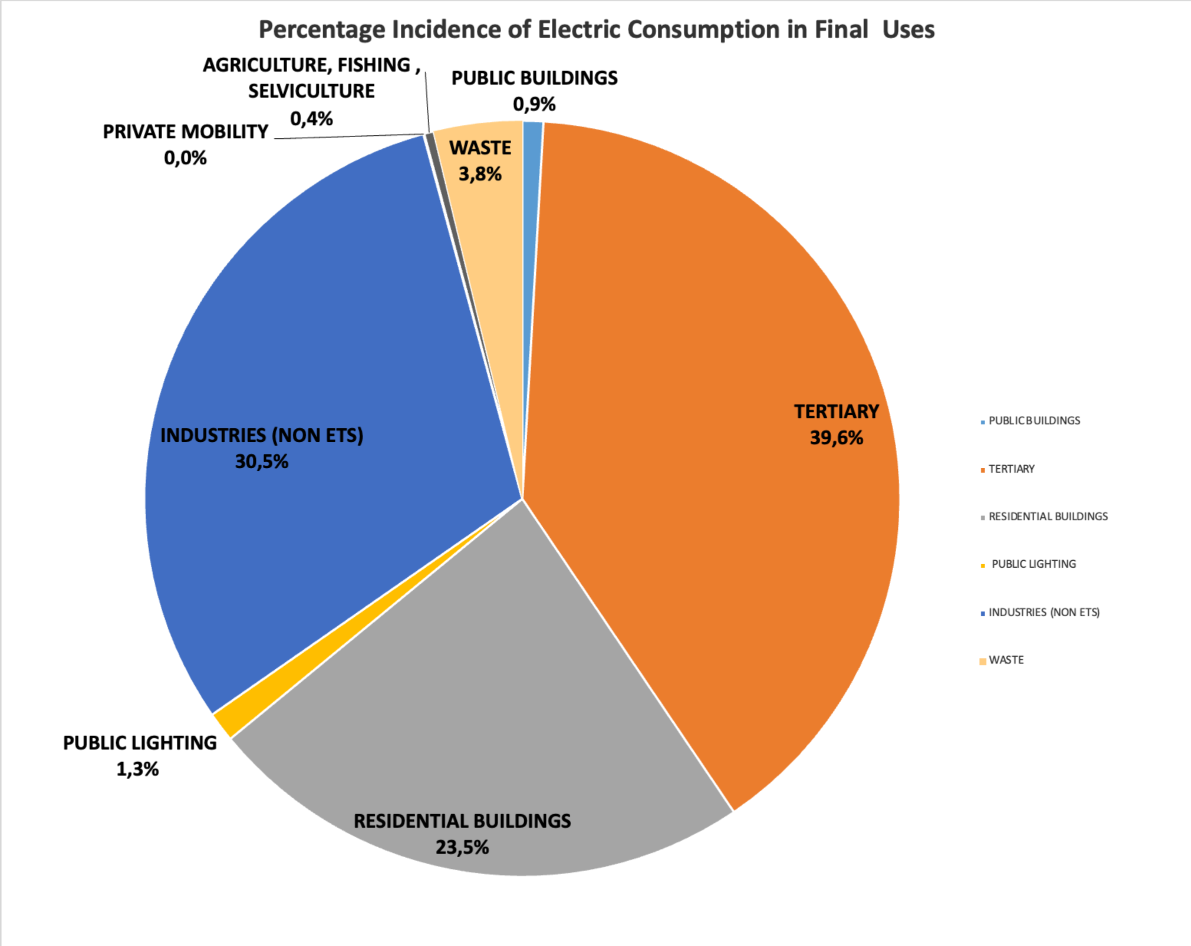
USE	THERMAL CONSUMPTION [MWh/anno]	ELECTRICAL CONSUMPTION [MWh/anno]	EMISSIONS [t CO2/anno]
PUBLIC BUILDINGS	12.701,69	7.567,01	5.480,28
TERTIARY	48.273,89	335.526,37	139.014,18

RESIDENTIAL	721.160,06	198.923,72	224.469,51
PUBLIC LIGHTING	-	10.790,15	4.155,98
INDUSTRY (NOT ETS)	593.685,41	257.747,09	219.391,65
MUNICIPAL FLEET	513,40	-	118,23
PUBLIC TRANSPORT	11.657,20	-	2.863,48
PRIVATE MOBILITY	1.213.870,67	340,16	291.591,63
AGRICOLTUR, FISHERIES, FORESTRY	10.311,36	3.457,22	3.864,48
WASTE	56.592,33	31.899,67	24.200,78
TOTAL	**2.668.766,02**	**846.251,41**	**915.150,19**

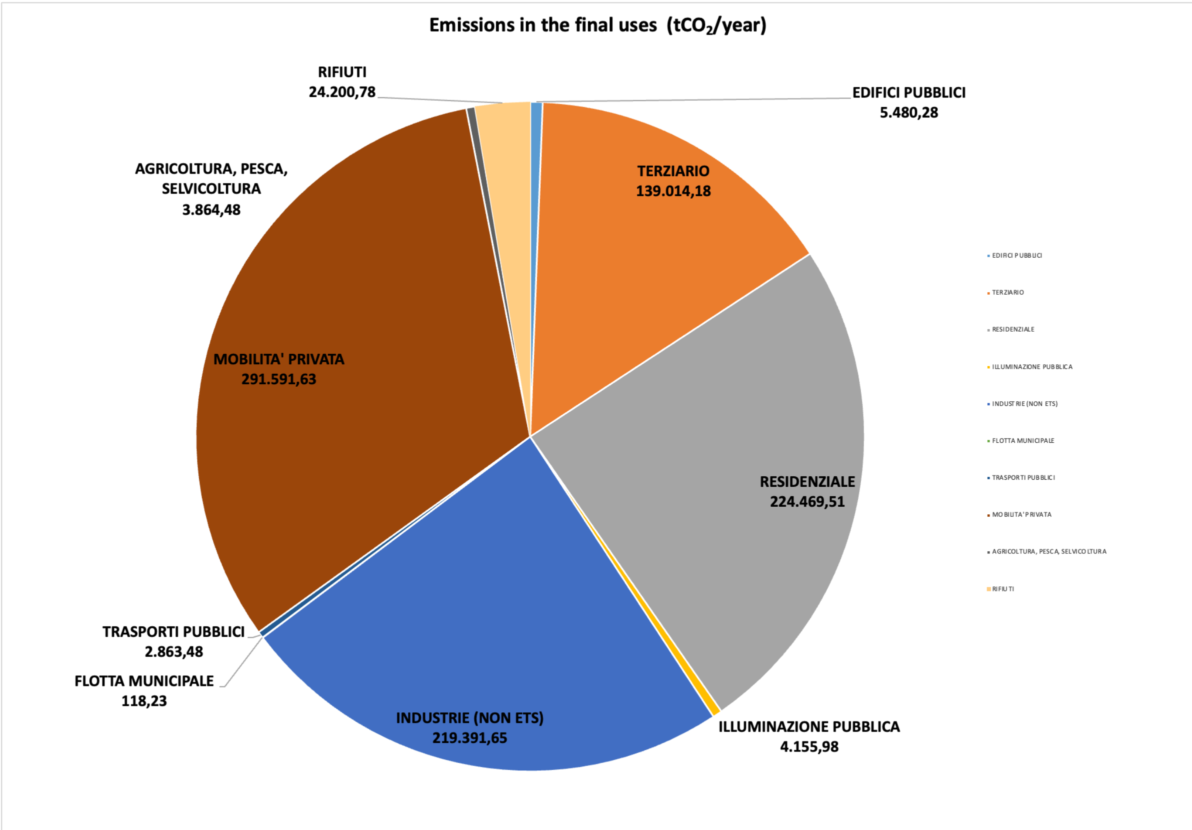
As far as thermal energy consumption is concerned, the three sectors accounting for the largest share of final consumption are private mobility with 45.5%, the residential sector with 27% of the total, and the industrial sector (excluding industries covered by the European Emissions Trading Scheme - ETS) with 22.2%.



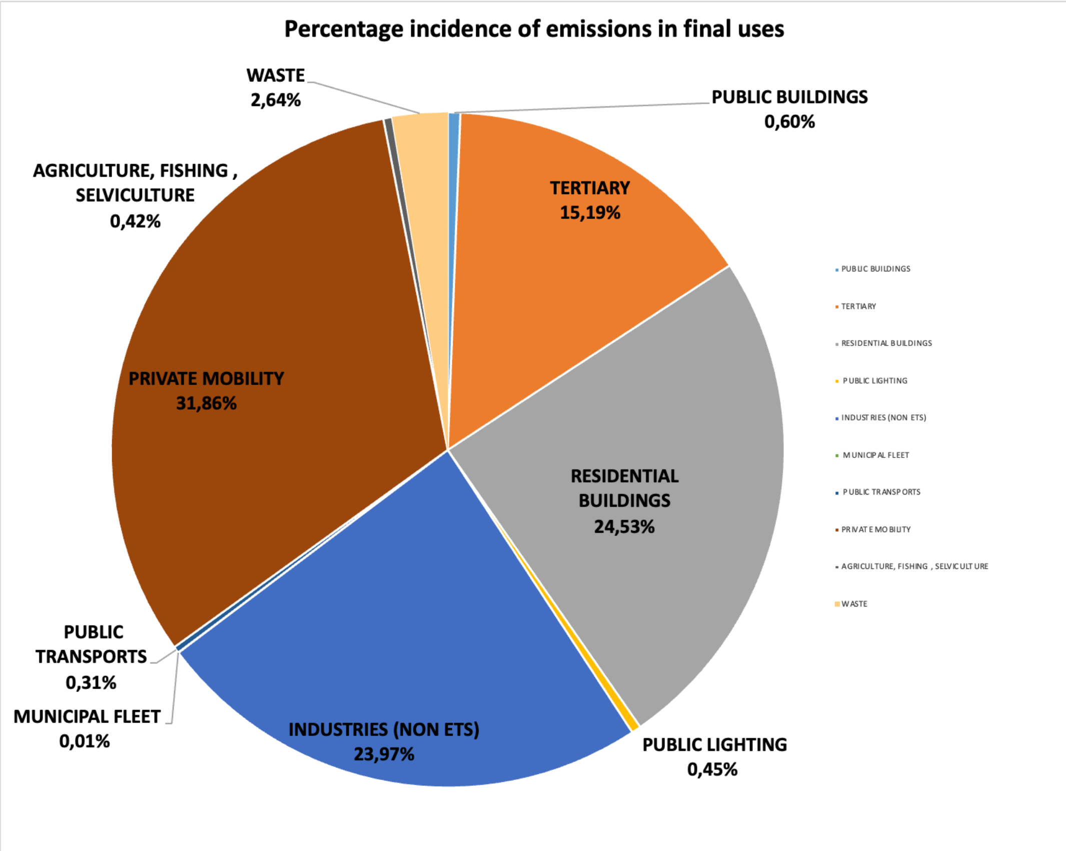
Electricity, on the other hand, is mainly used in the tertiary sector (39.6%), industrial (30.5%) and in the residential sector (23.5%).



In 2019, a total of 915,150 tonnes of CO_2 were emitted in the Municipality of Prato, broken down as follows:



Furthermore, the following graph shows the distribution of emissions for the various sectors analyzed. 31.86% of emissions are associated with private and commercial transport. This is followed by the residential sector with 24.53%, the industrial sector (excluding the industries covered by the European Emissions Trading System - ETS) with 23.97% and the tertiary sector with 15.19%. For the remaining sectors, the percentage incidence of emissions in end uses is less than 3%.



Below we will analyse each sector in detail, associating energy consumption with the contribution of each in terms of CO2 emissions.

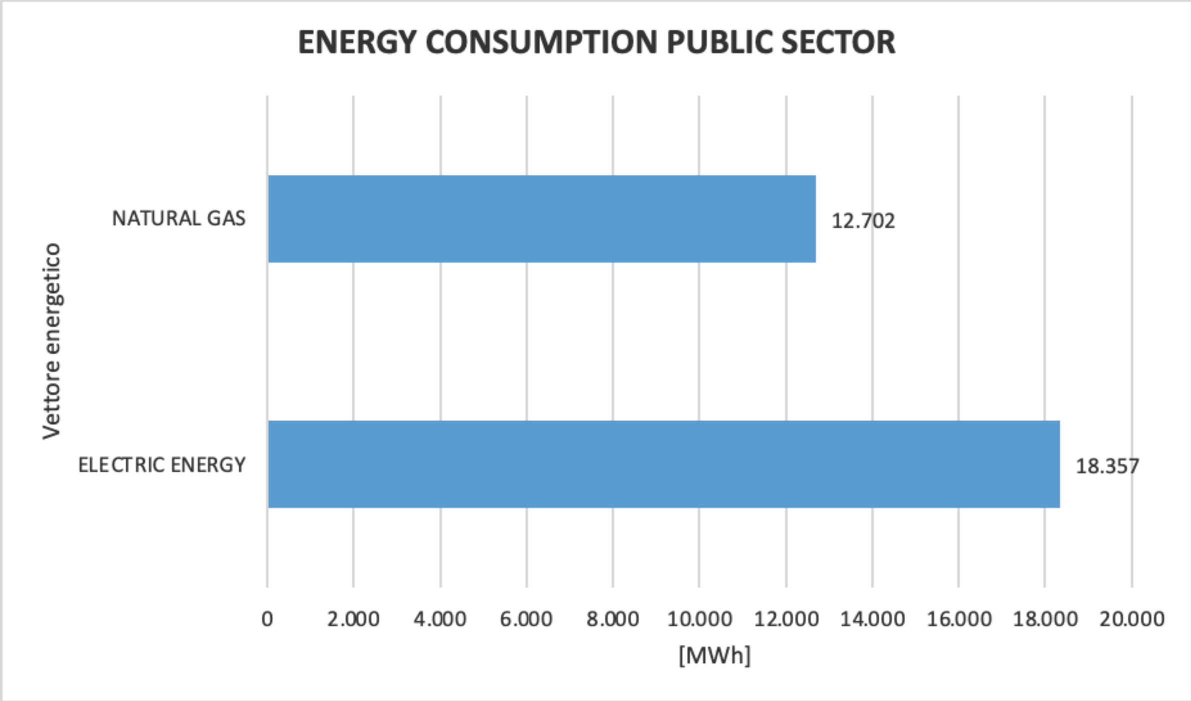
PUBLIC SECTOR (BUILDINGS AND LIGHTING)

From a perspective of reducing CO2 emissions in the Municipality of Prato, the energy consumption of the municipal administration and the related emissions play a particularly important role. The organization enjoys high visibility and its behavior serves as an example and affects its credibility in interactions with other entities. At the same time, energy expenses represent a significant item in the municipal budget and their reduction in times of limited funds widens the administration's scope for action in other fields.

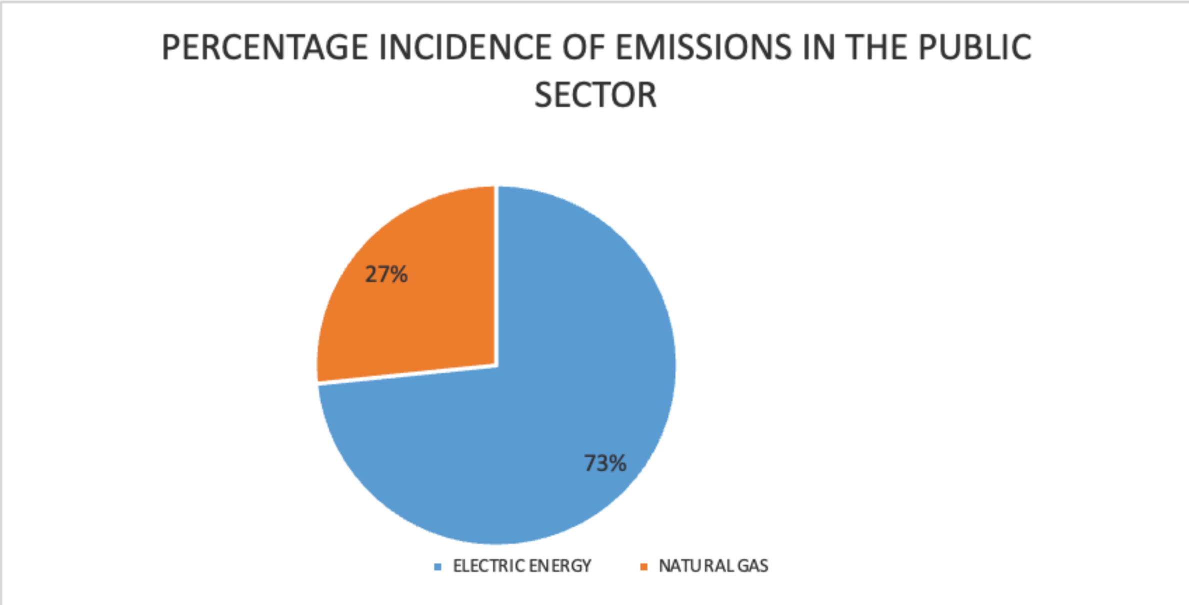
Public sector consumption refers to all electrical and thermal users owned and/or directly managed by the Municipality, i.e. those on which the Municipality has the possibility of acting to reduce consumption and emissions.

The energy consumption was provided by the municipal Energy Manager and by the companies that distribute electricity and natural gas in the municipal area.

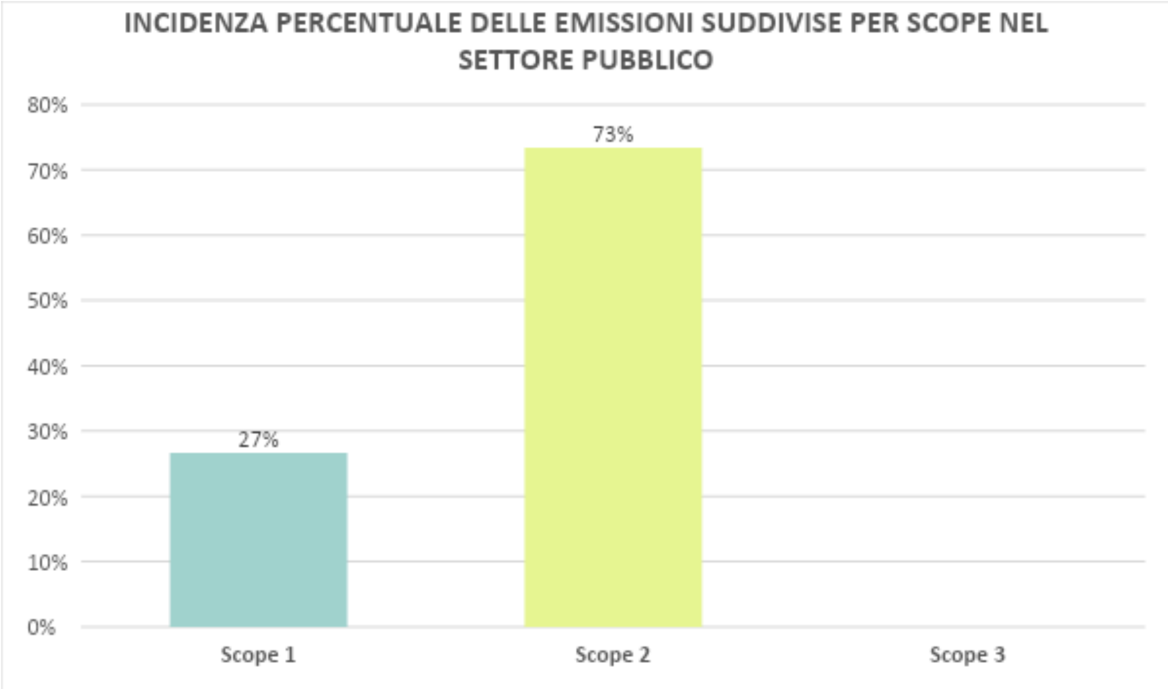
The total consumption of municipal buildings and public lighting is 12,702 thermal MWh and 18,357 electrical MWh.



Emissions in the public sector in 2019 amounted to 9,636 t of CO2, of which 73% were due to the use of electricity.

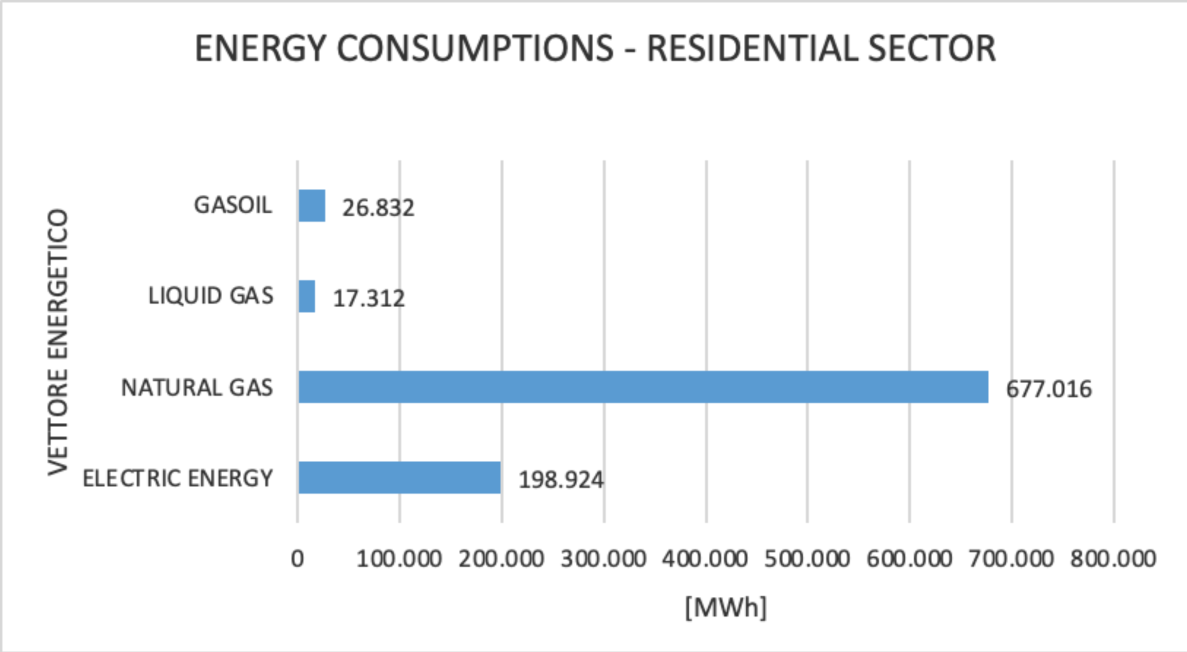


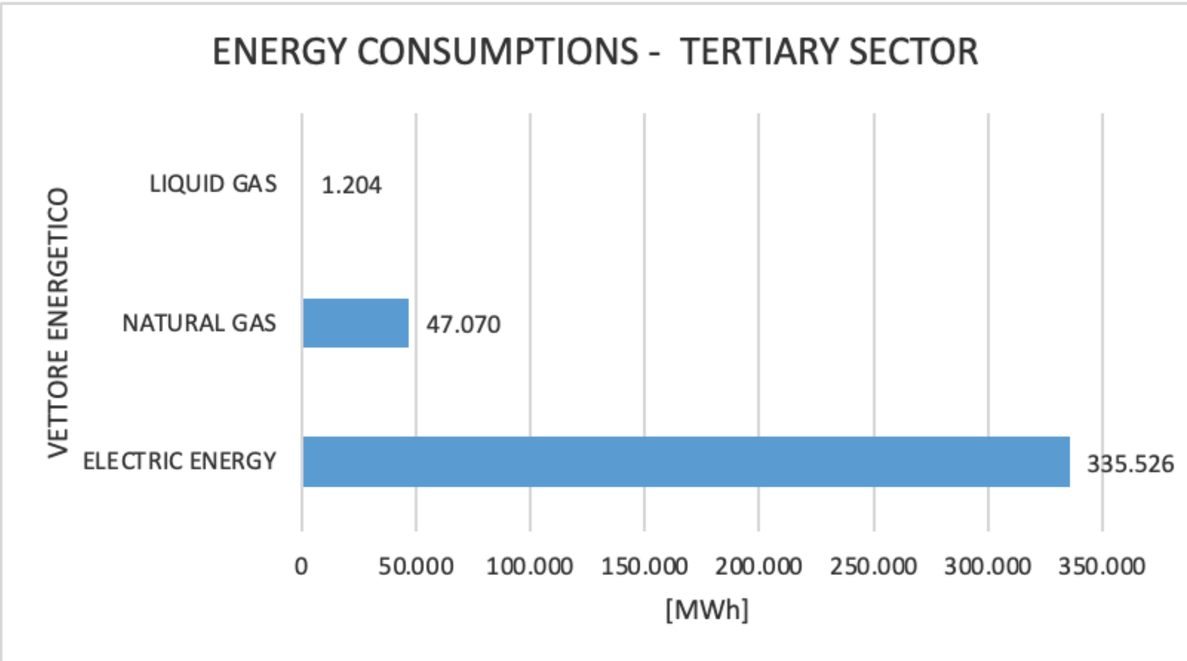
Finally, the following graph shows the percentage impact of emissions in the civil sector divided by scope 1, scope 2 and scope 3:



CIVIL SECTOR (RESIDENTIAL AND TERTIARY)

The total consumption in the civil sector in 2019 is 534,450 MWh of electricity and 769,434 MWh of heat. In the residential sector, the most used fuel is natural gas, while in the tertiary sector the most used energy carrier is electricity.





The analysis of consumption in the civil sector was based on the following sources:

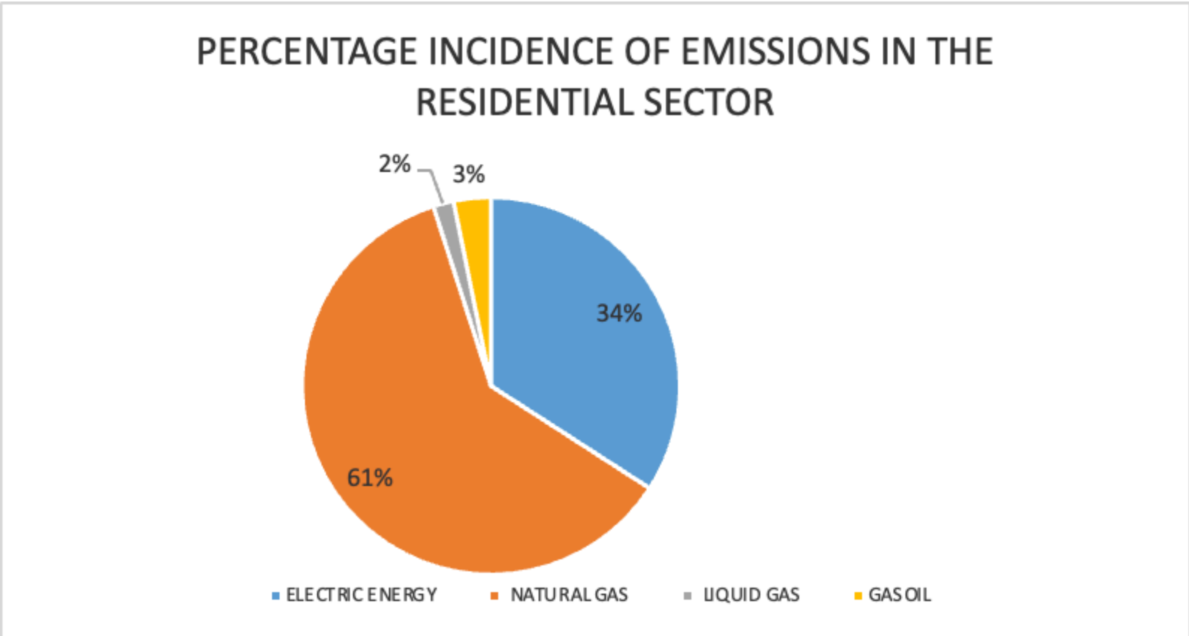
- Municipal electricity distributor “e-distribuzione S.p.A.”;
- Municipal natural gas distributor “Toscana Energia”;

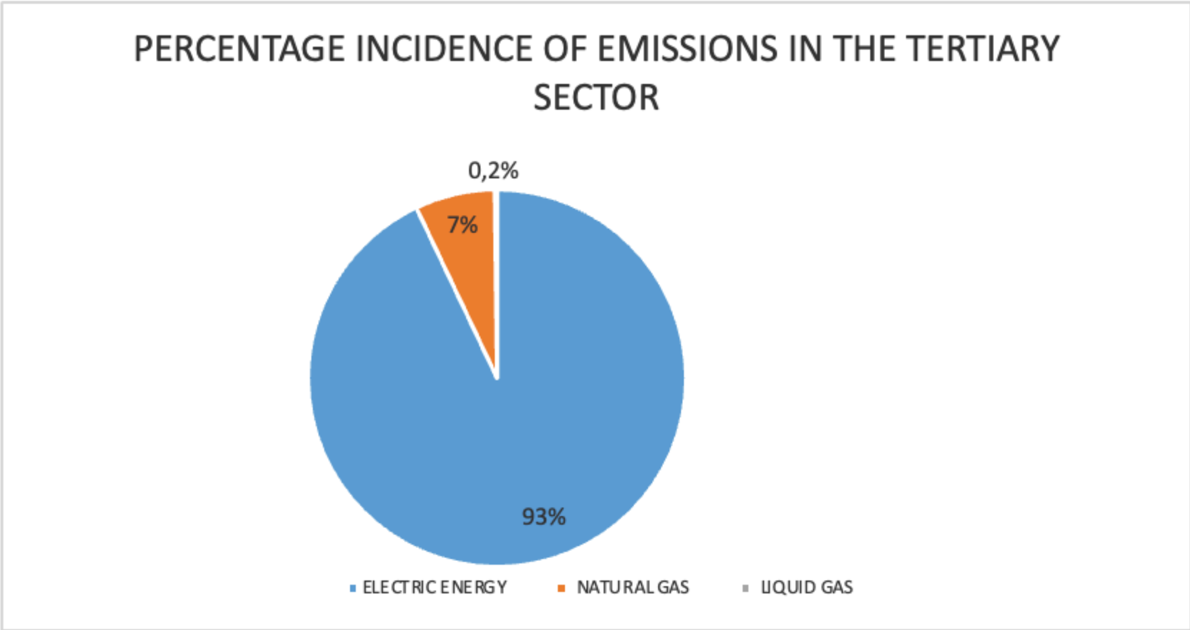
- Oil bulletin of the Ministry of Economic Development.

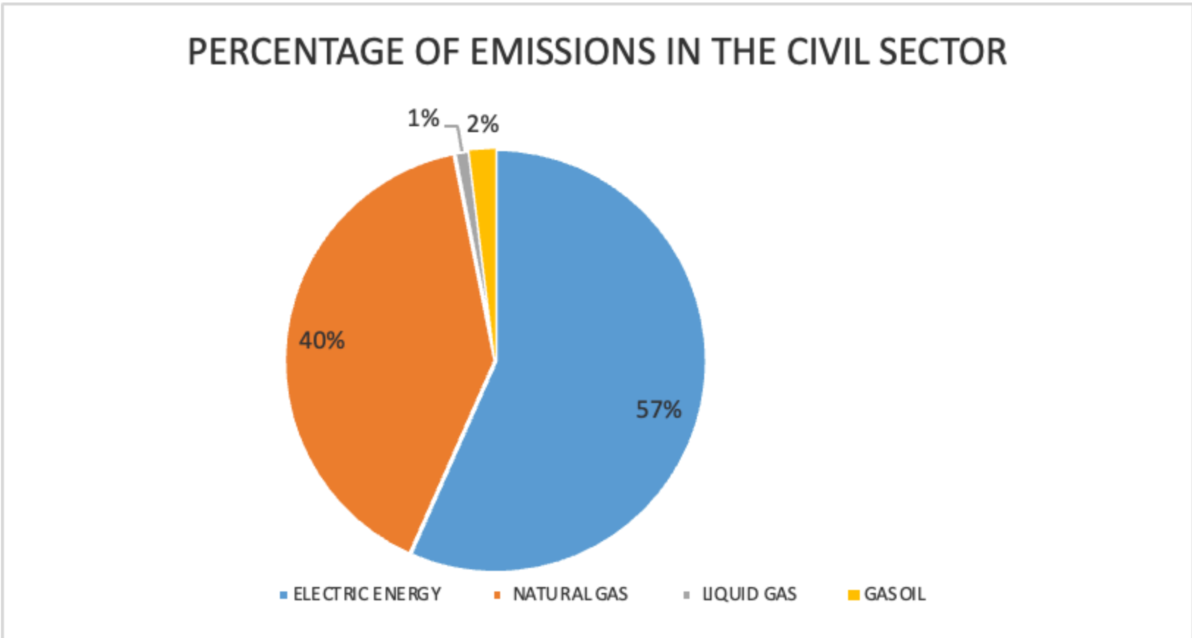
In particular, the consumption of diesel for heating in the residential sector and the consumption of LPG (liquefied petroleum gas) for heating in the civil sector (residential and tertiary) were calculated by re-proportioning the activity data available at provincial level on the basis of demographic data provincial and municipal; Furthermore, it is assumed that LPG is used for both automotive and civil uses. Therefore, having separated the portion relating to automotive consumption, the portion relating to the civil sector was deducted. This consumption was allocated to the tertiary and residential sectors with the same percentage incidence of natural gas consumption in the two sectors.

Emissions in the civil sector in 2019 amounted to 363,484 t of CO2. In particular, emissions in the residential sector are equal to 224,470 t of CO2 while in the tertiary sector they are equal to 139,014 t of CO2.

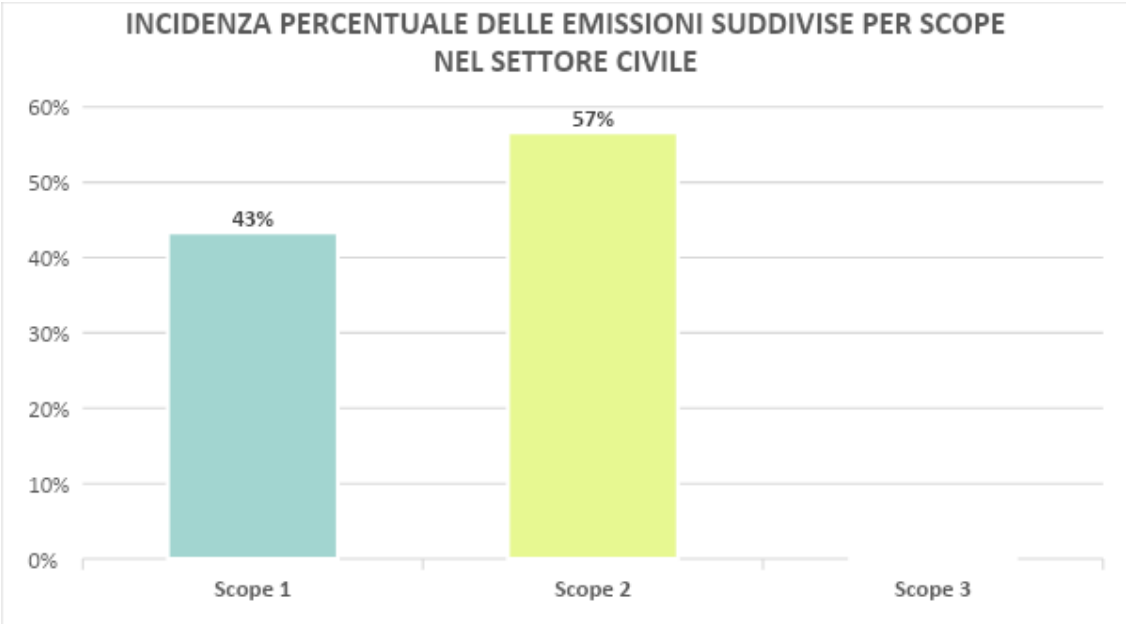
The percentage incidence of emissions in the civil sector (residential and tertiary) is shown in the following graphs:





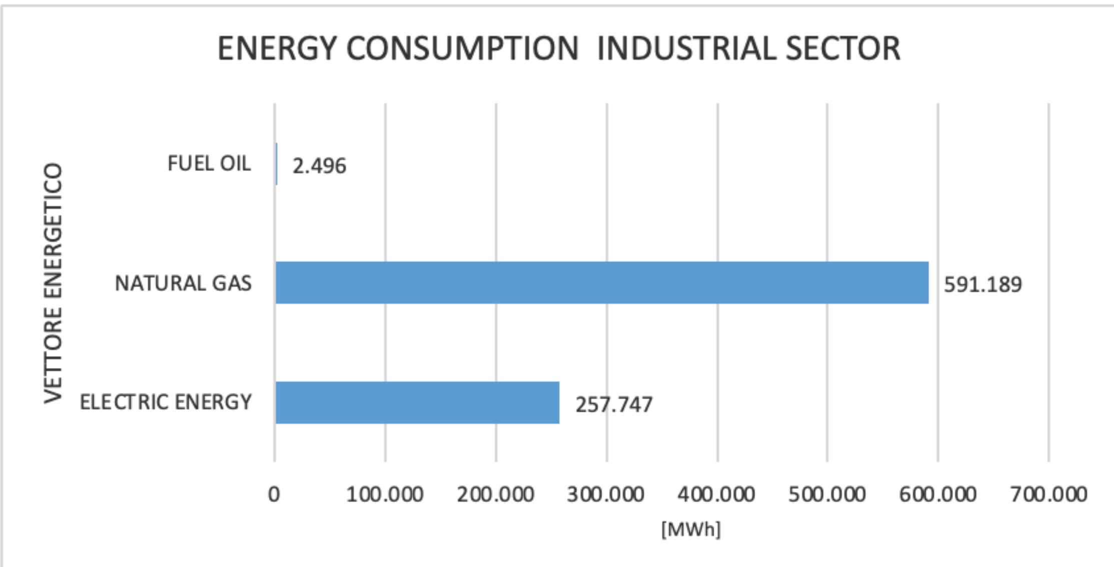


Finally, the following graph shows the percentage impact of emissions in the civil sector divided by scope 1, scope 2 and scope 3:



INDUSTRIAL SECTOR (EXCLUDING INDUSTRIES COVERED IN THE EUROPEAN EMISSIONS TRADING SYSTEM – ETS)

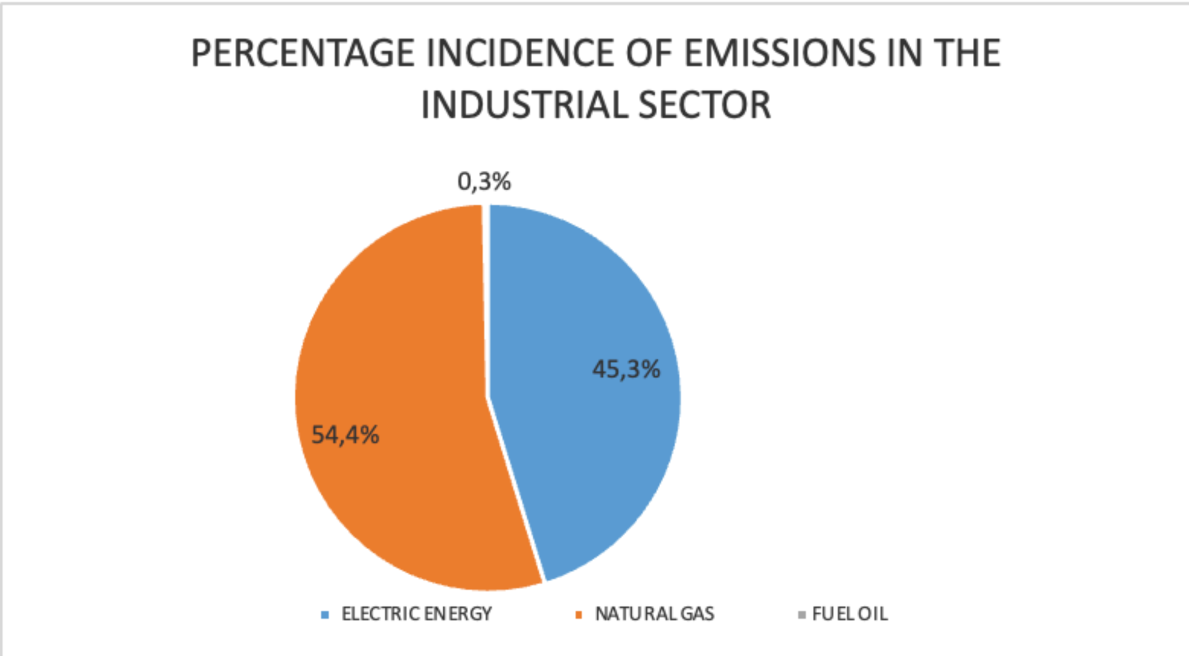
The total consumption of the industrial sector in 2019 is 593,685 thermal MWh and 257,747 electrical MWh.



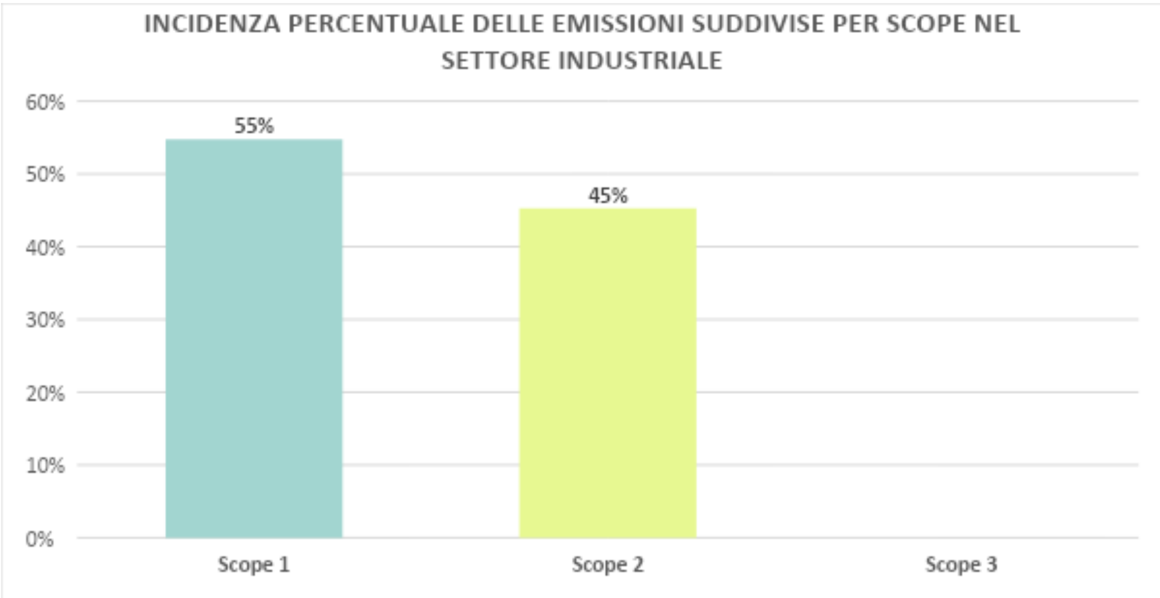
The analysis of consumption in the industrial sector was based on the following sources:

- Municipal electricity distributor "e-distribuzione S.p.A." – the activity data reported by the distributor for the industrial sector also includes the electricity consumption associated with the charging infrastructure of electric traction vehicles and systems relating to the waste sector. Therefore, the consumption relating to the aforementioned sectors (calculated separately) has been separated from the industrial sector and reported in specific sections (transport sector and waste sector);
- Municipal methane distributor "Toscana Energia" - the activity data relating to natural gas consumption reported by the distributor for the industrial sector also includes consumption associated with plants operating in the waste sector. Therefore, consumption relating to the waste sector (calculated separately) has been separated from the industrial sector and reported in a specific section (waste sector).
- Oil bulletin of the Ministry of Economic Development - the activity data relating to the consumption of fuel oil in the industrial sector was calculated by re-proportioning the provincial data.

Emissions from the industrial sector in 2019 amounted to 219,392 t of CO_2, of which 54,7% due to thermal energy consumption:



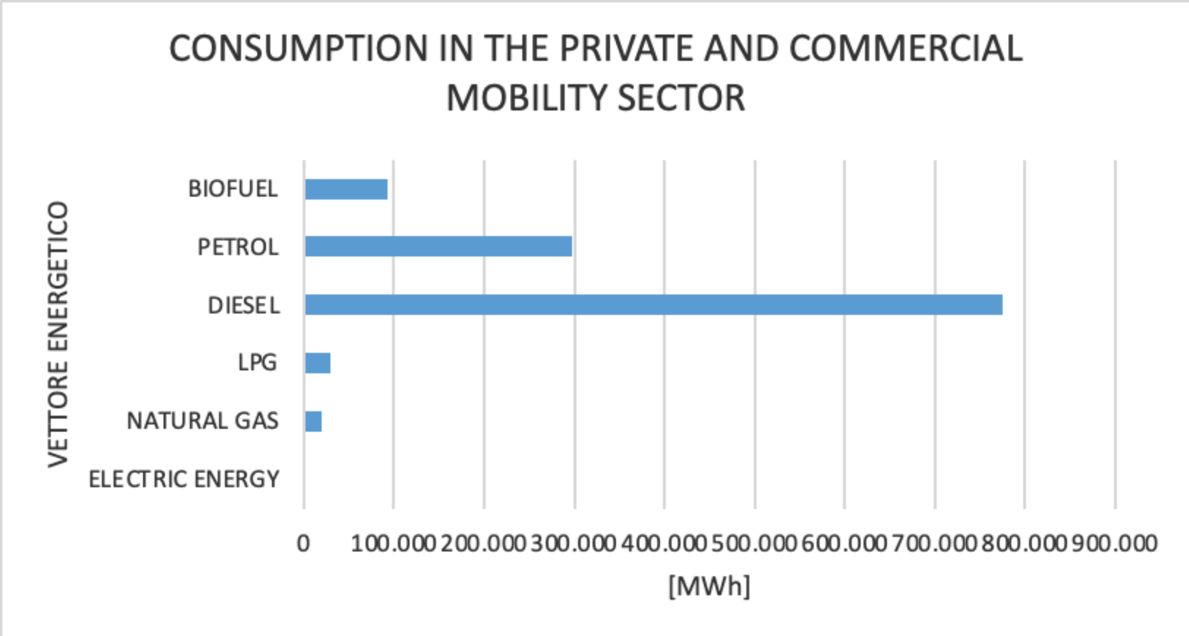
Finally, the following graph shows the percentage incidence of emissions in the industrial sector divided by scope 1, scope 2 and scope 3:



TRANSPORT SECTOR

PRIVATE AND COMMERCIAL MOBILITY

In the private and commercial mobility sector, 340 MWh of electrical energy was used in 2019 and 1,213,871 MWh of thermal energy was consumed.



The electricity used was calculated from the number of electric, petrol-hybrid and diesel-hybrid vehicles constituting the municipal vehicle fleet[4] . In particular, the number of equivalent vehicles was calculated by considering the percentage of plug-in hybrid electric cars running on petrol and diesel for petrol-diesel hybrids through the registrations of cars in Italy broken down by fuel type. For plug-in hybrid petrol-diesel cars, an average mileage of 50 per cent was assumed in electric mode and the remaining 50 per cent in petrol-diesel mode.

The average annual kilometres travelled (referring to the Region of Tuscany) was deduced from the Report prepared by the UnipolSai Observatory[5] .

Finally, the average consumption (kWh consumed per km travelled) of electric vehicles reported in the document of the Regulatory Authority for Energy Networks and the Environment (ARERA)[6] was taken into account for the calculation of the electricity used.

Natural gas consumption was calculated from the number of natural gas and petrol/methane vehicles. In particular, the number of equivalent vehicles was calculated by assuming for petrol/methane vehicles that 90 per cent of kilometres are driven on natural gas and the remaining 10 per cent on petrol.

The average annual kilometres travelled (referring to the Region of Tuscany) was deduced from the Report prepared by the UnipolSai Observatory.

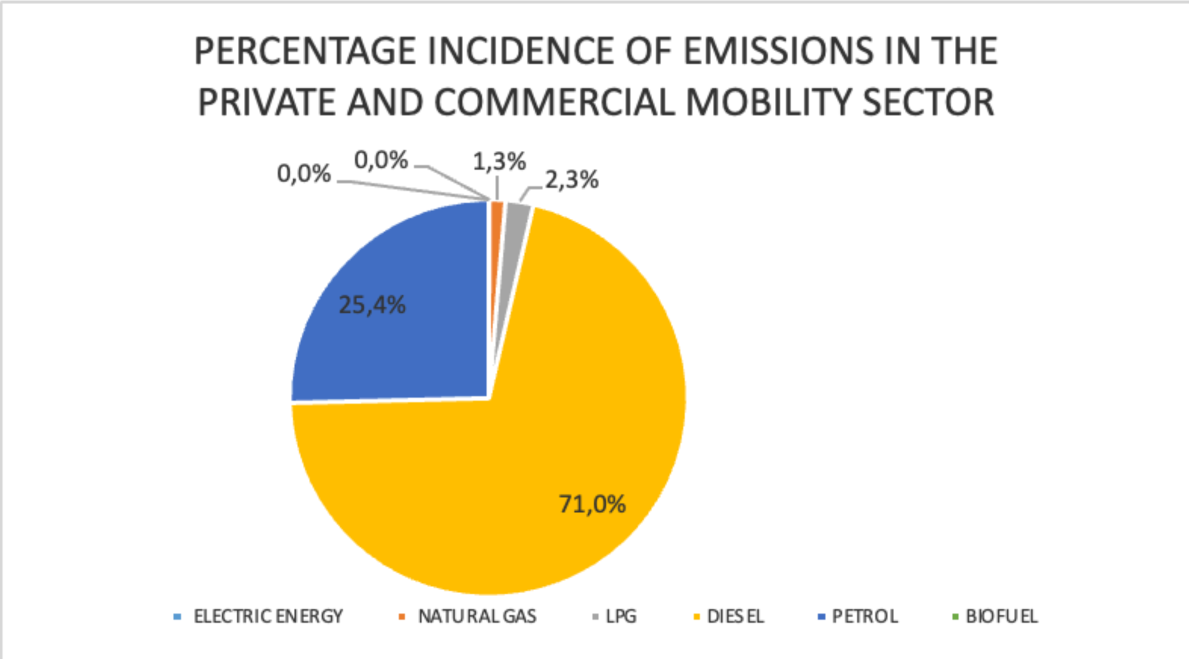
The activity figure for the ***consumption of LPG*** for motor vehicles (liquefied petroleum gas) was calculated by reproportioning the provincial figure taken from the Ministry of Economic Development's oil bulletin on the basis of the number of equivalent cars deducted from the municipal and provincial vehicle fleet provided by ACI.

In particular, the number of equivalent vehicles was calculated by assuming for petrol/liquid gas vehicles that 90 per cent of kilometres are driven on liquid gas and the remaining 10 per cent on

petrol.
The ***consumption of petrol and diesel was*** calculated by reproportioning the provincial data taken from the Ministry of Economic Development's oil bulletin on the basis of the number of equivalent cars deducted from the municipal and provincial vehicle fleet provided by the ACI. For these fuels (petrol and diesel), a biofuel percentage of 8% was considered, in line with the reference legislation on the obligation to mix biofuels (considered zero emission).

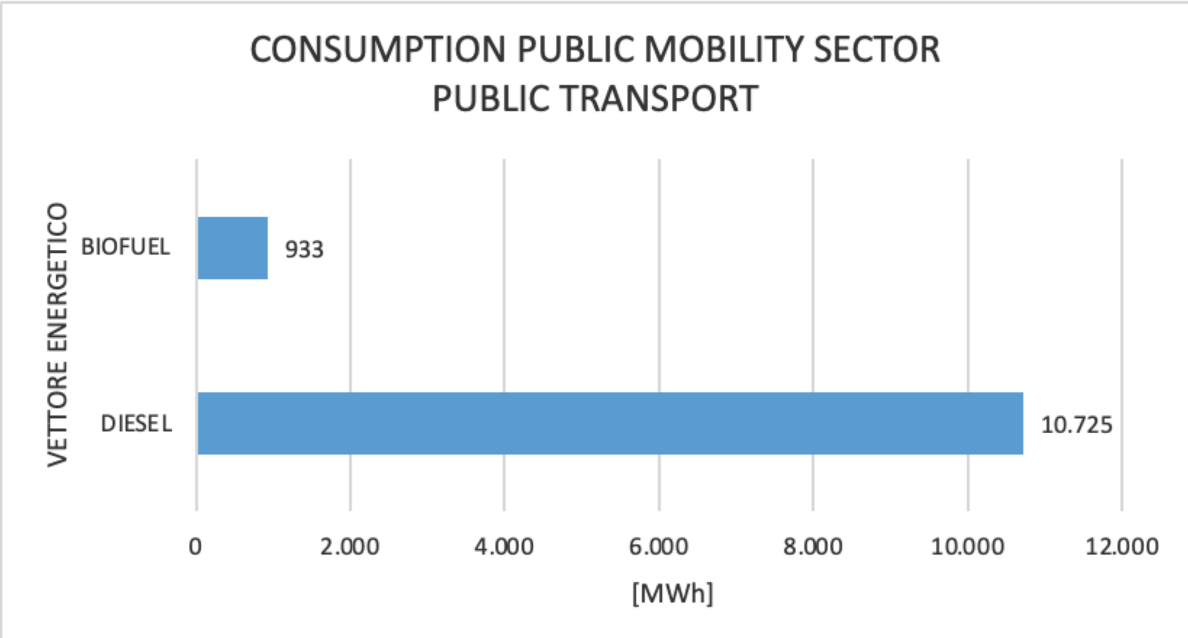
The consumption calculation performed refers to the entire municipal vehicle fleet. Therefore, in order to calculate the consumption of private and commercial transport only, the consumption of the car fleet controlled/managed by the municipal authority and of public transport (calculated as described in the following sections) was subtracted.

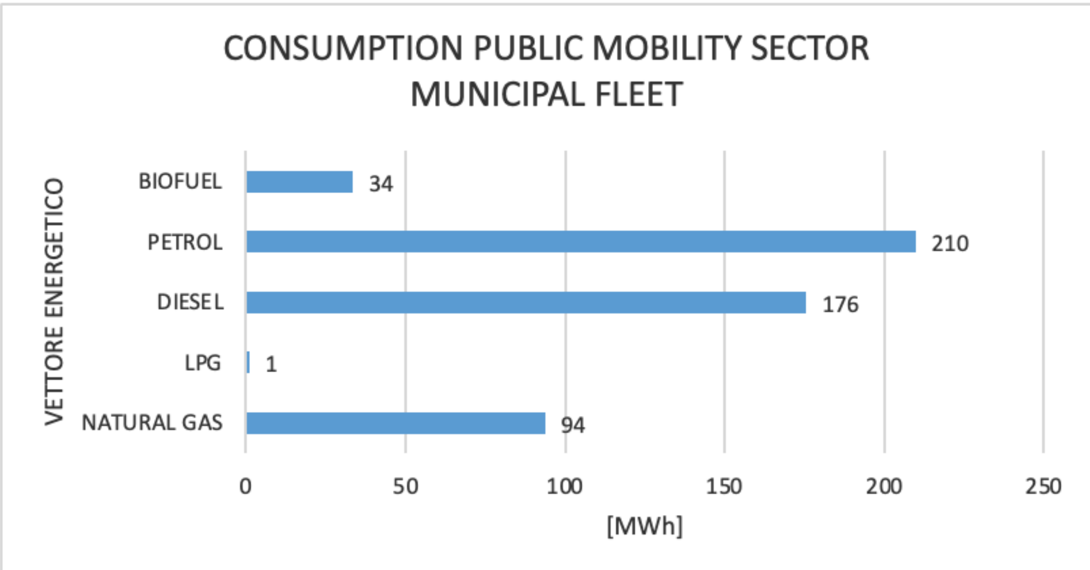
Emissions from private mobility as of 2019 amount to 291,592 t CO2. Biofuels, as sources derived from biomass, do not contribute to emissions:



PUBLIC MOBILITY (MUNICIPAL FLEET AND PUBLIC TRANSPORT)

The total thermal consumption in 2019 of public transport is 11,657 MWh, while that of the municipal fleet is 513.40 MWh.



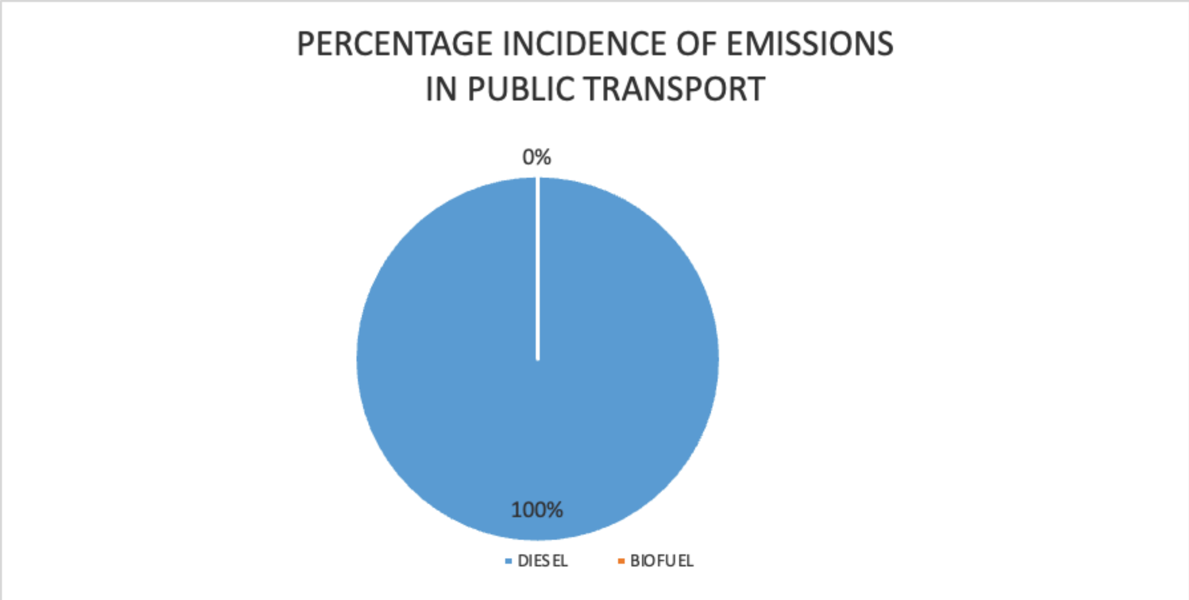


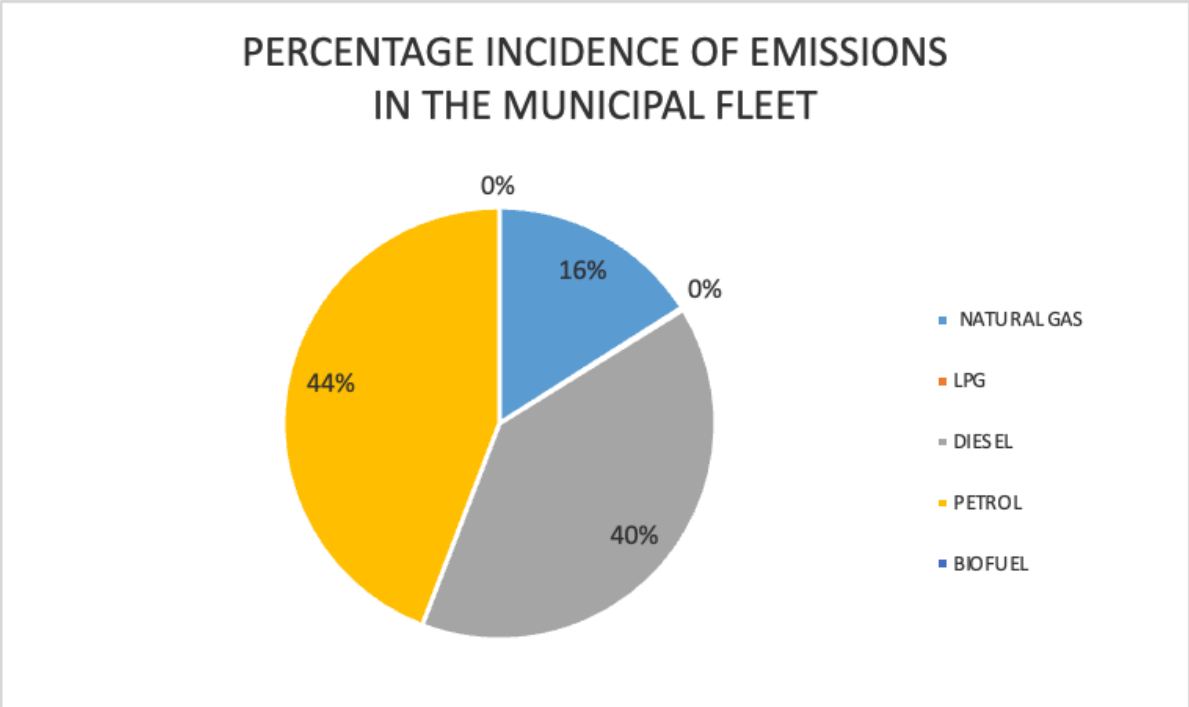
The consumption of the municipal fleet's vehicles was calculated on the basis of the data recorded by the Municipality of Prato's Public Transport Office, while the most up-to-date data provided by CAP Autolinee was used for public transport.
In addition, the LPG consumption refers to the year 2020 (similar to the 2018 consumption), as the Provedance did not report this figure for the year 2019.

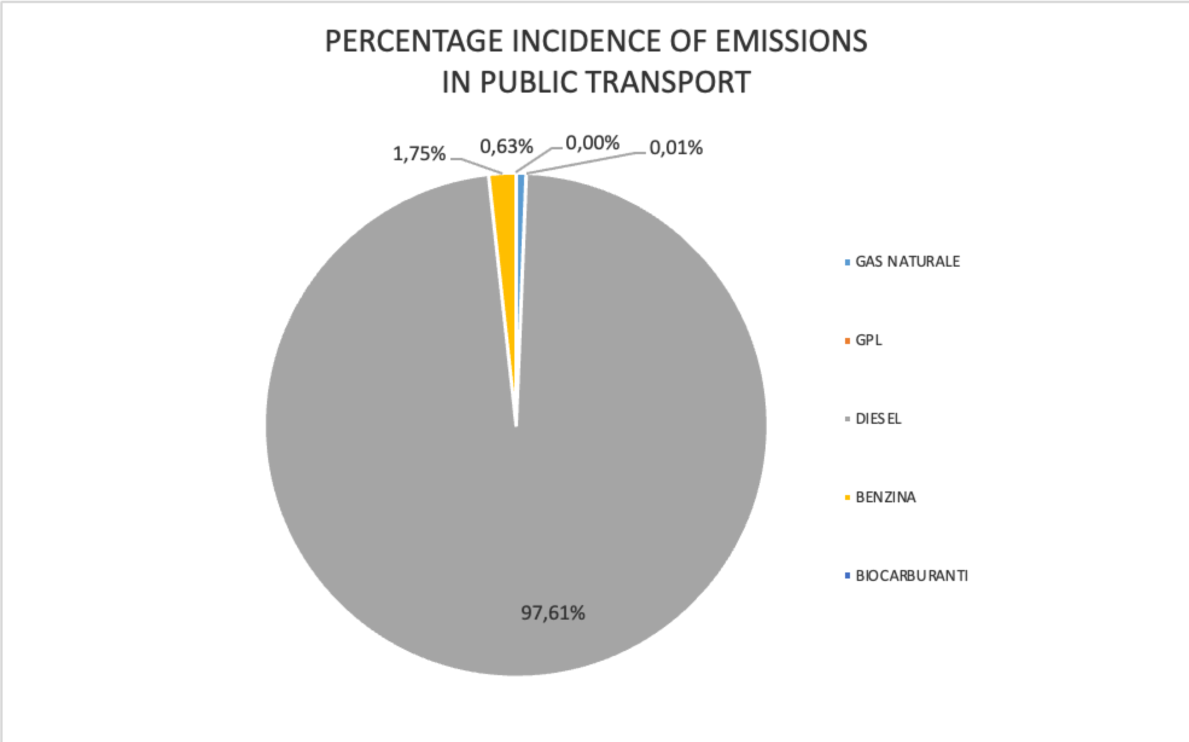
As for private mobility, a percentage of biofuel was considered in petrol and diesel by 8 per cent.

Emissions from public transport as of 2019 are 2,863 t CO2, while those from the **municipal**

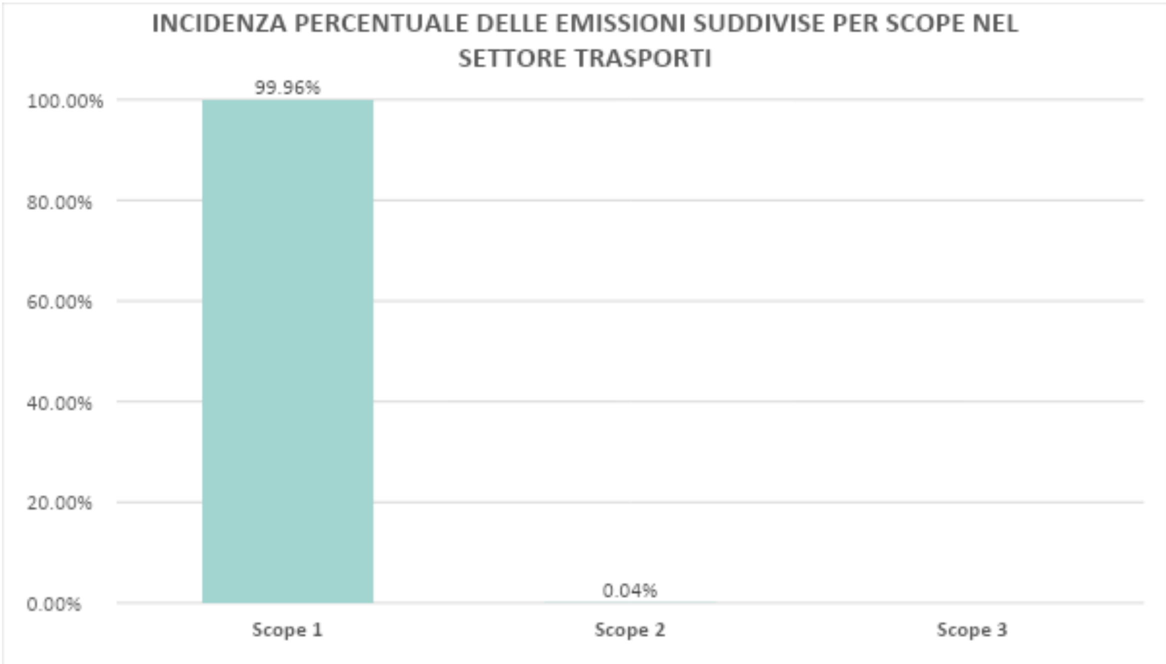
fleet are 118.23 t CO2. Biofuels, as sources derived from biomass, do not contribute to emissions:





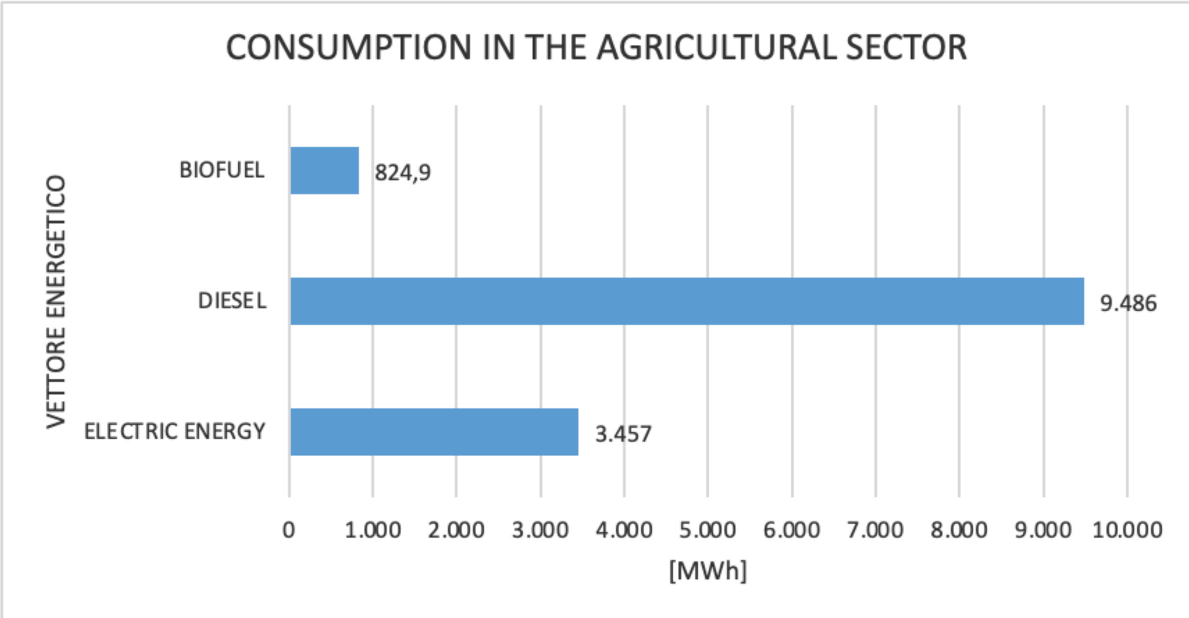


Finally, the graph below shows the percentage share of emissions in the transport sector broken down by scope 1, scope 2 and scope 3:



AGRICULTURE SECTOR

In the agricultural sector as of 2019, 10,311 MWh of heat was consumed and 3,457 MWh of electricity used.

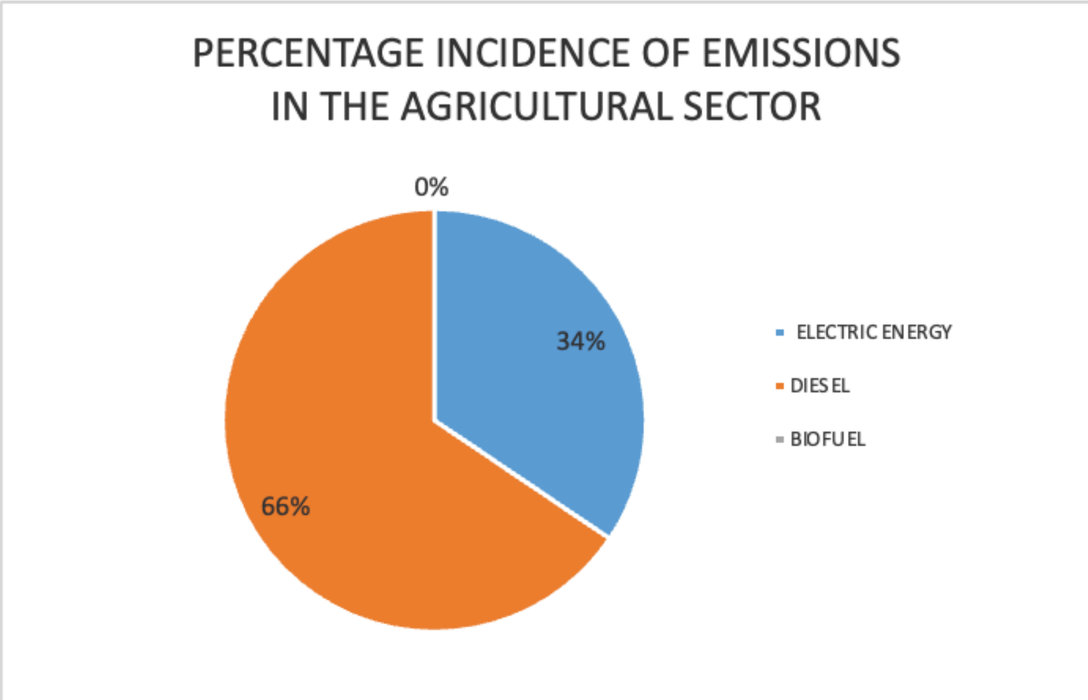


The data on electricity use were provided by the municipal distributor 'e-distribuzione S.p.A.'.

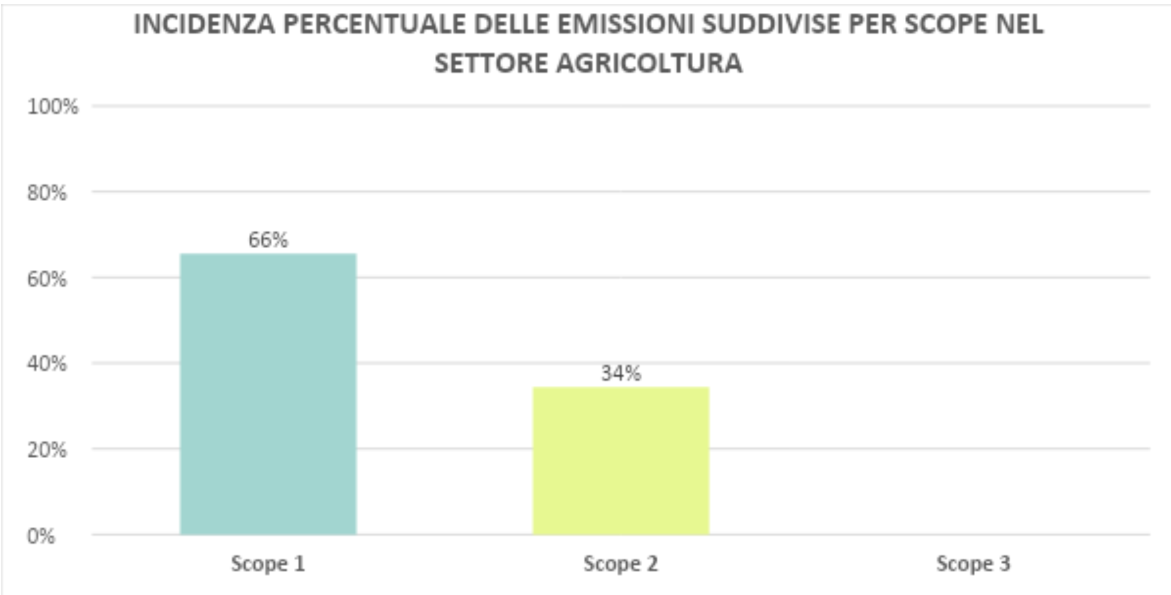
Diesel consumption data refer to provincial sales provided by the Ministry of Economic Development, re-proportioned at municipal level on the basis of municipal and provincial UAA (Utilised Agricultural Area) provided by ISTAT.

A biofuel percentage of 8% was also considered for agricultural diesel.

Emissions in the agricultural sector as of 2019 amount to 3,864 t CO2, 66% of which is due to thermal energy consumption:



Finally, the graph below shows the percentage incidence of emissions in the agricultural sector broken down as follows for scope 1, scope 2 and scope 3:



WASTE SECTOR

In the Municipality of Prato, a door-to-door municipal solid waste collection service is provided by Alia Servizi ambientali S.p.A. In addition, the company Gestione Impianti Depurazione Acque, better known as G.I.D.A., is also present in the Municipality, offering environmental services in the wastewater and liquid waste sector.

The solid waste considered in the analysis refers only to municipal waste as at the time of the analysis there was no available activity data on the industrial waste produced.

BUILDINGS, EQUIPMENT/TERTIARY INSTALLATIONS (NON-MUNICIPAL) - ALIA SERVIZI AMBIENTALI S.P.A.

The electricity use and natural gas consumption of Alia's plants in the Prato area (reported in scope 2 and scope 1, respectively) were derived from the company's Carbon Footprint of Organisation (CFO) performed in 2019.

For undifferentiated waste, the amount of waste destined for waste-to-energy and landfill outside the Municipality of Prato (scope 3) was derived from the data provided in the Sustainability Report 2019. The emissions associated with these treatments were calculated using emission factors in the Ecoinvent database (latest version available) by extrapolating from the processes Municipal solid waste {RoW}| treatment of municipal solid waste, sanitary landfill and Municipal solid waste {IT}| treatment of municipal solid waste, incineration only direct fossil CO2 emissions. In addition, the CO2 emissions related to the processes in the waste-to-energy plant and landfill are only due to the use of natural gas (the diesel fuel of the vehicles used in the landfill was not taken into account). Finally, using the conversion factors for natural gas, the associated energy consumption was calculated.

PRIVATE AND COMMERCIAL TRANSPORT- ALIA SERVIZI AMBIENTALI S.P.A.

Alia Servizi Ambientali SpA has a fleet of vehicles for collection services, sweeping and treatment/disposal plants distributed among the sites in which it operates.
Greenhouse gas emissions generated directly by Alia SpA are essentially attributable to transport related to collection and sweeping carried out in the served territory and to transport to treatment/disposal plants.
The emissions related to waste collection vehicles in the Prato territory were calculated by reproportioning the total emissions reported in the Sustainability Report 2019 referring to the collection services carried out in all the municipalities in which the company operates with the amount of waste collected in the Municipality of Prato.
The calculation of emissions related to the transport of waste downstream of collection at third-party facilities was carried out using the same methodology as described above, reporting this value in scope 3 as these emissions occur outside municipal boundaries.
It is assumed that the vehicles used by Alia are diesel-powered. Therefore, using the conversion factors for diesel, the associated energy consumption was calculated. A biofuel percentage of 8% was considered for this fuel.

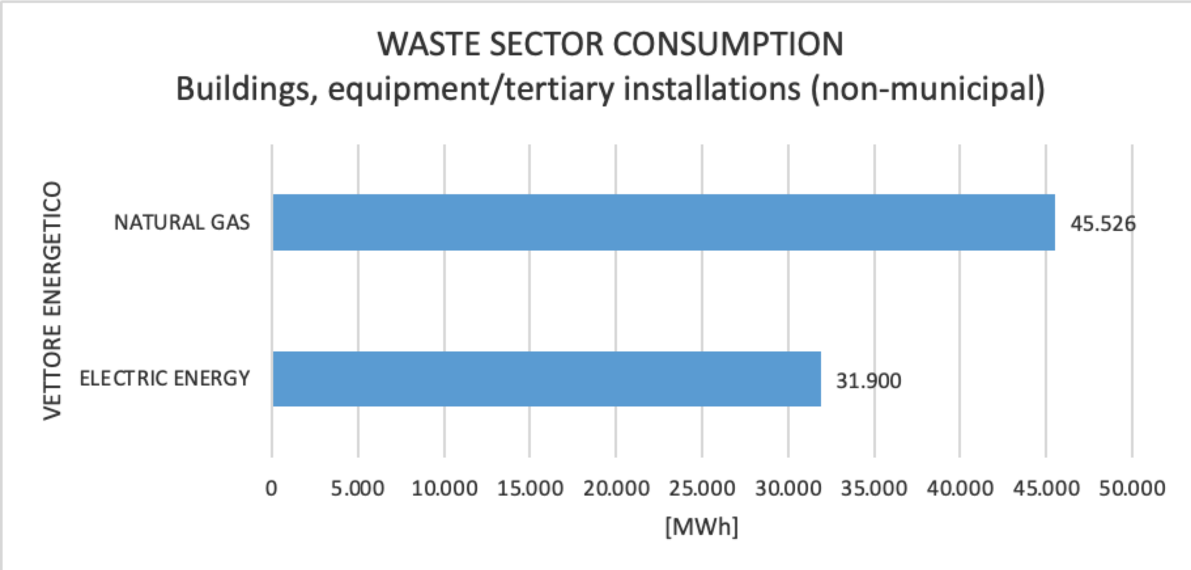
TERTIARY (NON-MUNICIPAL) BUILDINGS, EQUIPMENT/INSTALLATIONS - G.I.D.A. S.P.A.

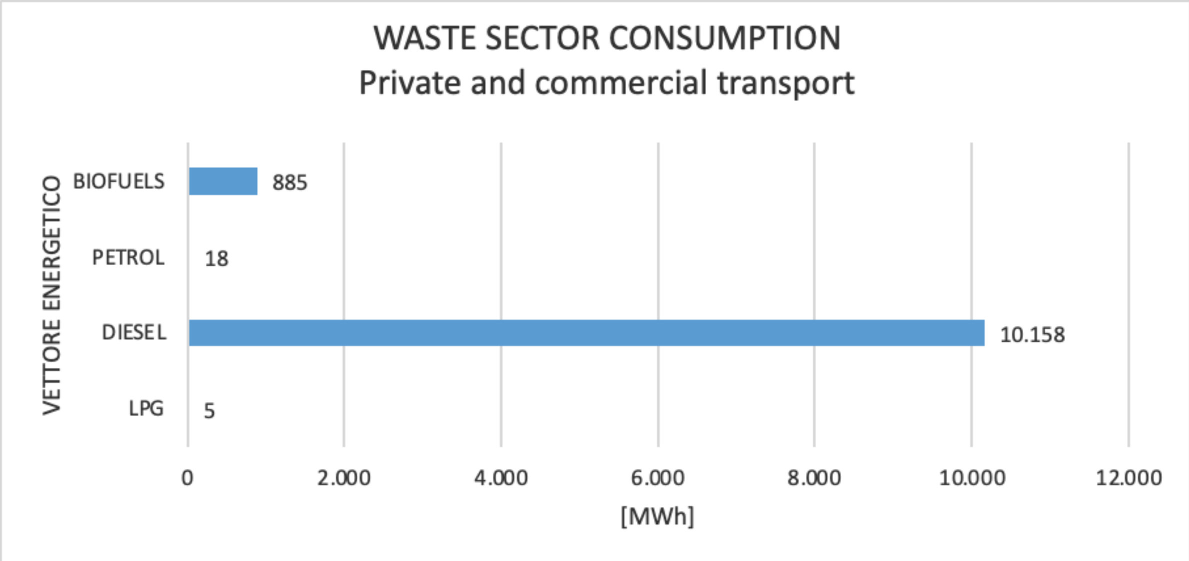
The electricity use and natural gas consumption of the G.I.D.A. plants in the Prato area (reported in scope 2 and scope 1, respectively) were taken from the company's Environmental Declaration made in 2022. The corresponding emissions were calculated by applying the relevant emission factors.

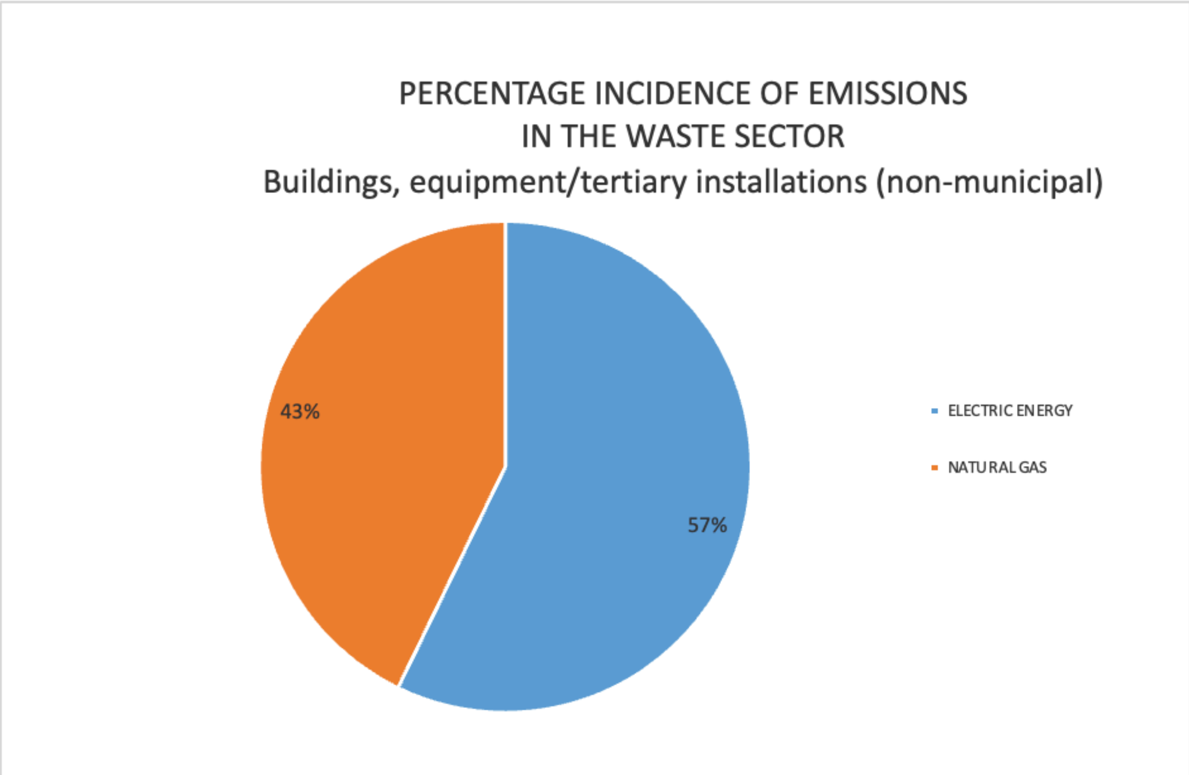
PRIVATE AND COMMERCIAL TRANSPORT- G.I.D.A. S.P.A.

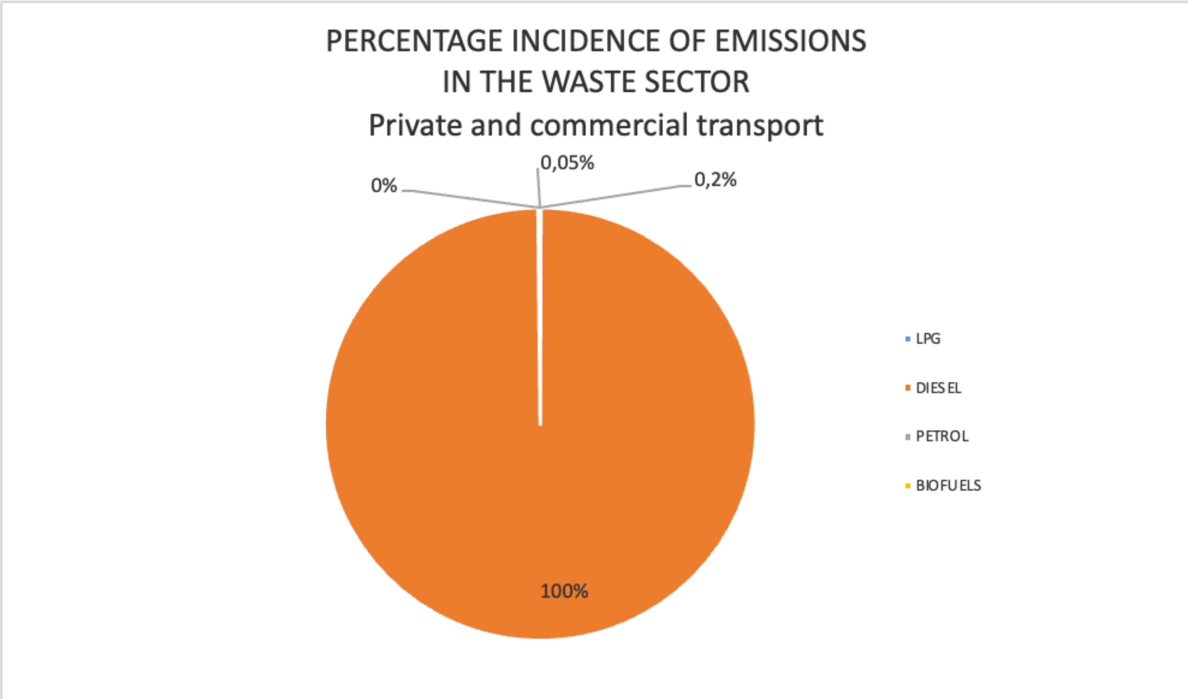
The consumption of automotive-related fuels was taken from the company's Environmental Declaration made in 2022. The energy carriers considered are diesel, petrol and LPG. For diesel and petrol, a biofuel percentage of 8% was considered.

The following graphs show the energy consumption and associated emissions in the waste sector for both buildings, tertiary (non-municipal) equipment/facilities and private and commercial transport.

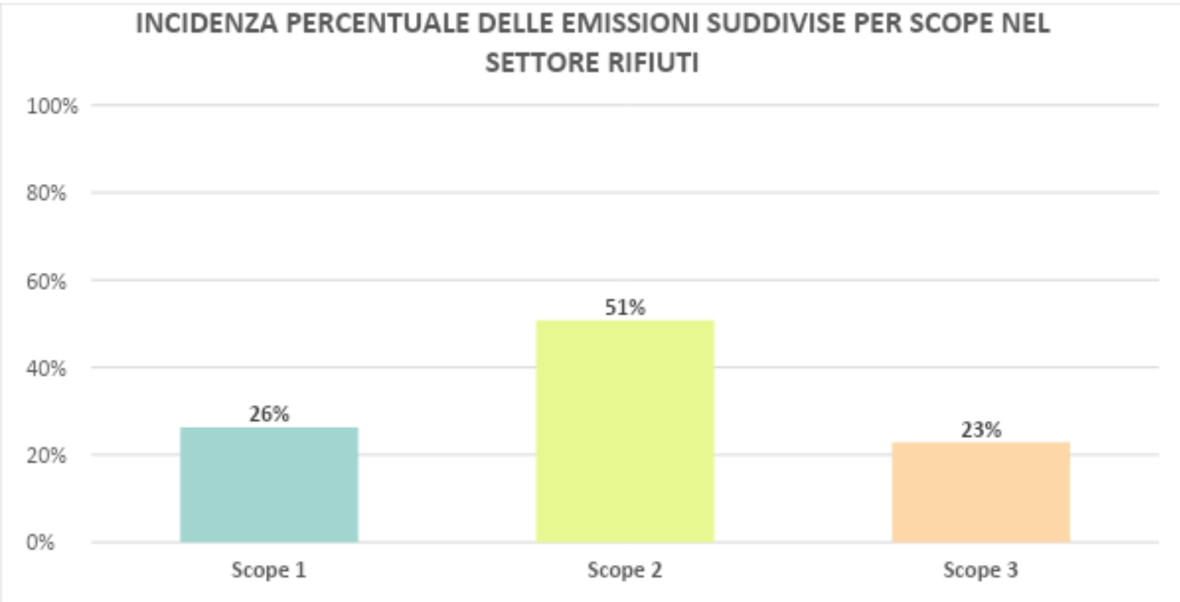



WASTE SECTOR CONSUMPTION
Private and commercial transport
VETTORE ENERGETICO
BIOFUELS
885
PETROL
18
DIESEL
10.158
LPG
5
0
2.000
4.000
6.000
8.000
10.000
12.000
[MWh]


PERCENTAGE INCIDENCE OF EMISSIONS
IN THE WASTE SECTOR
Buildings, equipment/tertiary installations (non-municipal)
43%
57%
ELECTRIC ENERGY
NATURAL GAS



Finally, the graph below shows the percentage incidence of emissions in the waste sector broken down by scope 1, scope 2 and scope 3:



2.2 Module A-2 Current Policies and Strategies Assessment

Module A-2 “Current Policies and Strategies” should list relevant policies, strategies, initiatives or regulation from local, regional and national level, relevant to the city’s climate neutrality transition.

A-2.1: List of relevant policies, strategies & regulations					
Type	Level	Name & Title	Description	Relevance	Need for action
(regulation/ policy /strategy/ action plan)	(local, region al, nation al, EU)	name of policy /strategy/ plans)	(Description of policy/ strategy/ plans)	(Describe relevance/ impact on climate neutrality ambition)	(list any suggeste d action at relation - to be further picked in Module C-1
Strategy	Europe an	Green new deal	The European Green Deal represents a broad set of political initiatives proposed by the European Commission, with the objective main objective of achieving climate neutrality in a plan of impact assessment, aiming to raise the EU's greenhouse gas emission reduction target by 2030 to at least 50 per cent, with a further reduction target of 55 per cent compared to 1990 levels. Part of this initiative is the revision of all existing climate-related laws, as well as the introduction of new laws concerning the circular economy, building renovation, biodiversity protection, sustainable agriculture and innovation. The European Green Pact is a significant	Identify the line of address strategic European from	

			step towards promoting sustainability and mitigating climate change in the EU.		
Action Plan	National	PNIEC	The PNIEC emphasises the importance of action on both renewable energy production and energy efficiency to reach the 40 per cent target. This could lead to an increased adoption of cogeneration and the promotion of energy balancing mechanisms such as storage and an appropriate capacity market. The plan also emphasises energy security as a priority, promoting the production of alternative fuels to reduce dependency on energy imports. The application of the principles of 'Efficiency first' is emphasised e 'technological neutrality' for ensure consistent implementation of energy policies. Among the main strategic directions of the new PNIEC are the enhancement of electrical renewables, the production of renewable fuels such as biomethane and hydrogen, renovation buildings, the electrification of final consumption, the promotion of electric vehicles and policies to reduce private mobility. There will also be a focus on CO2 sequestration, transport and capture. Furthermore, the shares of renewable energy sources in electricity and heat	Identify national strategic guidelines to be followed	

			consumption have been increased compared to the initial targets, showing a commitment increasing towards renewable energies within the plan.		
Action Plan	National	NRRP	The National Recovery and Resilience Plan (NRRP) is part of the Next Generation EU (NGEU) programme, a EUR 750 billion package, half as grants and half as loans, created by the European Union in response to the pandemic. The Italian NRRP, known as 'Italia Domani', has a total of 222.1 billion, including a Fund Complementary and additional funds of up to EUR 248 billion. The Plan is developed along six missions, of which the first three are of particular interest for the definition of the actions of the Prato Municipality's Climate Neutrality Plan: 1. **'Digitalisation, Innovation, Competitiveness, Culture':** allocates a total of over EUR 49 billion (of which EUR 40.3 billion from the Recovery and Resilience Facility and EUR 8.7 billion from the Supplementary Fund) with the aim of promoting the country's digital transformation, supporting innovation in the production system, and investing in two key sectors for Italy, tourism and culture.	Identifying funding lines to implement actions mitigation actions in the area of mobility, production from renewable sources, alternative energy carriers, including hydrogen, energy efficiency and digitalisation	

			2. "Green Revolution and Ecological Transition": allocates a total of EUR 68.6 billion (EUR 59.5 billion from the RRF Facility and EUR 9.1 billion from the Fund) with the main objectives of improving the sustainability and resilience of the economic system and ensuring an equitable and inclusive environmental transition. **3. "Infrastructure for Sustainable Mobility'**: for a total amount of EUR 31.5 billion (EUR 25.4 billion from the RRF Facility and EUR 6.1 billion from the Fund). Its primary objective is the development of a modern, sustainable transport infrastructure covering all areas of the country. The Plan also includes an ambitious programme of reforms, to facilitate the implementation phase and more generally contribute to the modernisation of the country and make the economic environment more favourable to development of business activity		
Action Plan	Regional	Environmental Plan and Energetic or Regional (Paer)	The Regional Environmental and Energy Plan (Paer) of the Region of Tuscany, established by Regional Law 14/2007, was approved in 2015 and represents the planning tool for the environment and energy in the region. It incorporates previous regional strategies such as the Pier (Regional Energy Plan), the Praa	Identify regional strategic guidelines, through the identification of areas unsuitable for wind, biomass and photovoltaic power plants,	

			(Regional Environmental Action Plan) and the Regional Programme for Protected Areas. The main objectives of the Paer are: Combating climate change and promoting energy efficiency and renewable energy. This focuses on research and technological innovation to develop new businesses in the green economy, from energy renewable energy to energy efficiency energy efficiency, promoting a transition to a low-carbon economy. Protecting and enhancing land resources, nature and biodiversity. The Paer aims to balance urban and infrastructural development with conservation of natural resources, turning them into a driver of economic, tourism and cultural development. Promoting the integration of environment, health and quality of life. The aim is to ensure a healthy environment and reduce health risks for citizens, recognising the strong connection between human health and the natural environment. Promoting the sustainable use of natural resources, with a particular focus on the protection of water resources, in line with European policies policies for a resource-efficient efficient use of resources.	e providing an overview of the region's renewable sources in the region and the criteria for access to administrative simplifications for energy installations	

			The Paer is based on constituent documents, including the Plan Specifications and various annexes covering several thematic areas, such as wind, biomass and photovoltaic energy production, geothermal energy, renewable energy sources, criteria for access to administrative simplifications for energy installations, and biodiversity, coastal defence, security seismic, lighting systems, and the extraordinary programme of strategic interventions for water resources.		
Action Plan	Local	PAESC PRATO	The Municipality of Prato joined the Covenant of Mayors in April 2014, sharing with the European Commission the commitment to reach a reduction of at least 20% of CO2 emissions by 2020. After adhering to the Covenant, a path was followed that led to the approval of the Sustainable Energy Action Plan (SEAP) in 2015 and the monitoring of the achievement of the Plan's objectives. The Municipality of Prato joined the Covenant of Mayors in April 2014, sharing with the European Commission the commitment to achieve at least 20 per cent reduction		

			of CO2 emissions by 2020. After adhering to the Covenant, a pathway was followed that led to the approval of the Sustainable Energy Action Plan (SEAP) in 2015 and the monitoring of the achievement of the objectives of the Plan.		
Action Plan	Local	The Sustainable Urban Mobility Plan	The Sustainable Urban Mobility Plan (SUMP) is a strategic planning tool for the transport and mobility sector. It covers the period 2015-2025 and is drawn up taking into account European mobility strategies and national legislation. The first element characterising the PUMS is sustainability; the aim is to evolve Prato's mobility towards sustainability in terms of environmental, social and economic		
Action Plan	Local	The Operational Plan	The Operational Plan was published in the BURT no. 42 of 16 October 2019, and became definitively effective on 15 November 2019 at the end of a journey that began in 2016 with the variant to the Structural Plan and the beginning of the procedure for the formation of the operational plan. The strategic framework of the Operational Plan, in coherence with the general objectives of the Structural Plan, intended to produce an overall urban planning vision of the future of the city of Prato, with respect to which the policies of territorial government are constantly		

			correlated to the broader policies of territorial development: cultural, social and economic development. A medium- to long-term vision based on a 171 idea of sustainable development, identifying the strategic themes on which to focus planning and towards which to converge the actions of both the public than the private one.		
Action Plan	Local	The Smart City Plan	The Plan was approved in 2017 and is valid for three years. In 2018, an update of the Plan was carried out, a survey of online services was conducted and evaluated, and a number of Smart Living Labs were activated as required by the guidelines. In order to gather and structure the trends already underway in the area into a more general and integrated proposal, the Administration has begun drafting an organic development plan called 'Prato Smart City', based on two cornerstones: - Survey on the state of development of the Smart City in Prato: carried out by PIN s.c.r.l. - Polo Universitario Città di Prato, in cooperation with Confservizi CISPEL Toscana, concerning the projects launched or recently concluded by the municipal administration and the investee companies. - Guidelines for the organic development of the Smart City in Prato: drawn up to define the actions necessary to give rise to the organic		

			development of a new Smart City plan in Prato.		
Action Plan	Local	Structural Plan	The Prato Structural Plan represents a key territorial planning tool, drawn up in compliance with the regional law on territorial government (L.R. 65/2014), flanked by the Operational Plan in replacement of the previous Plan. 2013 Structural Plan and Urban Regulations. This document, characterised by indefinite duration, plays a crucial role in guiding the sustainable development of the Prato territory. The newly adopted Structural Plan defines an overall framework for the sustainable development of the city in which urban planning, environmental planning and health prevention strategies are harmonised with a view to climate neutrality. urban planning, environmental planning and health prevention strategies are harmonised with a view to climate neutrality. In this framework, the Structural Plan and the PAESC become strategic documents of a single organic vision that projects the city towards its environmental transition, with a view to social inclusion and adaptation to the climate emergency.		
Action Plan	Local	Next Generation Prato	The 'Next Generation Prato' strategic-operational document represents a significant step in the Municipality's journey,		

			resulting from a collaborative and participatory approach with key actors in the economic fabric. This plan was developed to capitalise on the opportunities offered by the National Recovery and Resilience Plan (NRRP), a crucial initiative to promote a green and digital transition in Italy, favouring equity and inclusiveness. The NRRP, structured in 6 missions ranging from digitisation to green transition, provides the framework on which the 'Next Generation Prato' strategy document is based. The latter is designed to respond to the challenges and opportunities presented by the NRRP, helping to prepare the territory and production system of Prato to face future challenges. The document represents the result of an in-depth reflection process, involving key stakeholders in defining the city's future strategy. It outlines guidelines for the ecological transition and the adoption of new models economic, with the aim of generating positive impacts on the territory. At the same time, it serves as a starting point to guide the city's future activities. Co-design was conducted in cooperation with local stakeholders, such as trade associations, trade unions, public and private entities, in the context of the Prato Circular City governance table. The technical work was coordinated by the Prato Municipality's Europe		

			office, with the scientific supervision of ARCO of the Prato PIN. Starting from the policies already active in the area, initiatives and commitments have been systematised to promote local sustainable development, focusing on the needs and potential of the textile district. The result is the definition of 24 project files, constituting a portfolio that complements existing paths and suggests new directions for innovation, cohesion and regeneration of the city. For Prato, this represents a crucial moment to face and overcome the economic and social challenges caused by the Covid-19 pandemic. Thanks to the NRRP resources, the city becomes a context in which innovative projects contribute significantly to the narrative of its evolution and the surrounding area.		
Action Plan	Local	Three-year Public Works Programme	The Public Works Programme represents a strategic synthesis of the administration's objectives and needs, based on in-depth feasibility studies and analyses of the entity's needs. Its elaboration implies the identification and description of the works to be realised in the medium term, outlining specific characteristics for each of them. The Three-Year Programme of Public Works constitutes the reference framework for the planning and execution of major infrastructure projects, with a		

			special focus on works of an amount equal to or exceeding 150,000 euro, threshold defined with the entry into force of the Legislative Decree 36/2023. In accordance with Article 37 of Legislative Decree 36/2023, the approval of the Three-Year Programme takes place in compliance with of planning documents, consistent with the budget and according to the rules of the economic economic and financial programming, as well as the accounting principles. The annual list, which is an integral part of the programme, details the works to be started during the first year, specifying for each work the source of financing, indicated in the estimate, in the budget or otherwise available. It is important to emphasise that the non-inclusion of a work in the annual list does not preclude its implementation. In fact, unforeseeable situations, calamitous events or new legal or regulatory provisions may make it necessary to implement works not originally planned. The flexibility of the Public Works Programme thus makes it possible to respond in a timely and adequate manner to circumstances that require immediate and not previously planned interventions.		

A-2.2: Description & assessment of policies
(describe and assess listed policies, strategies, regulations etc. to add detail)

A-2.3: Emissions gap										
	Baseline emissions (percentage)		Residual emissions / offestting[1]		Baseline emissions reduction target[2]		Emissions reductions in existing strategies[3]		Emissions gap (to be addressed by action plan)[4]	
	(absolute)	(%)	(absolute)	(%)	(absolute)	(%)	(absolute)	(%)	(absolute)	(%)
Buildings (Edifici Pubblici + Terziario + Residenziale + Illuminazione Pubblica)	373.119,95	40,77 %	21.671,01	13,88%	351.448,94	46,30 %	91.943,29	43,51%	259.505,65	47,38 %
Transport (trasporto pubblico + privato + flotta municipale)	294.573,33	32,19 %	79.977,79	51,22%	214.595,55	28,27 %	58.695,66	27,77%	155.899,89	1269,39%
Waste	24.200,78	2,64%	11.919,28	7,63%	12.281,50	1,62%	0,00	0,00%	12.281,50	2,24%
Industrial Process and Product Use (IPPU)	219.391,65	23,97 %	42.327,82	27,11%	177.063,83	23,33 %	60.690,74	28,72%	116.373,09	21,25 %
Agricultural, Forestry and Land Use (AFOLU)	3.864,48	0,42%	254,64	0,16%	3.609,85	0,48%	0,00	0,00%	3.609,85	0,66%
Total	915.150,19	100%	156.150,53	17,06%	758.999,66	82,94 %	211.329,69	27,84%	547.669,97	72,16 %

[1] Residual emissions consist of those emissions which can't be reduced through climate action and are being offset. Residual emission may amount to a maximum of 20 % as stated by the Mission Info Kit.

[2] Baseline reduction target = Baseline emissions – residual emissions.

[3] Emission reductions planned for in existing action planning and strategies should be quantified per sector.

[4] Emissions gap = Baseline emission reduction target – Emissions reduction in existing strategies.

2.3 Module A-3 Systemic Barriers and Opportunities to 2030 Climate Neutrality

Module A-3 "Systemic Barriers to 2030 Climate Neutrality" should document the results of the stakeholder, systems and ecosystem mapping and identification of systemic barriers and opportunities.

A-3.1: Systems & stakeholder mapping					
The table contains the entire system of actors mapped for the purpose of the co-design process. The actors were subdivided according to the network they belong to and profiled on the basis of their sphere of influence and interest. The actors who actually took part in the co-design process (*stakeholders involved*) were also specified.					
Network	Network description	Stakeholders mapping (stakeholders invited to the participatory process)	Stakeholders involved (stakeholders who attended the participatory process)	Influence (ability to resist recommendation or change)	Interest (stakeholders' likely concerns)
Partecipate e Utilities: ***High influence High interest*** *impacted by change and most able to act on it. They may either, support or oppose change*	Publicly held companies represent companies (utilities) whose shares are owned by the Region, Province or Municipality and which operate in the main sectors of land management (water resources, energy resources, infrastructure, waste	**Energy supply** Nwg Consiag servizi ambientali ESTRA spa Toscana Energia Duferco **Waste disposal** Revet ALIA spa Programma Ambiente Fondazione OPERATE **Water supply** GIDA spa Publiacqua	**Energy supply** Nwg Consiag servizi ambientali **Waste disposal** Fondazione OPERATE **Water supply** GIDA spa Publiacqua **Construction** EPP **Mobility** Interporto Toscana BIT mobility Autolinee Toscane	**High**	**High**

	management). The mapping of stakeholders with respect to this category is based on the four pillars of the climate neutrality strategy of the city of Prato: energy efficiency, sustainable mobility, circular economy, agriculture, land use and urban forestation.	**Construction** EPP **Mobility** Interporto Toscana Centrale Autolinee Toscane BIT mobility Ferrovie dello stato Taxi Prato – COTAPRA Cooperativa Tassisti Pratesi			
Trade Association: ***2.1.1Low influence High interest*** *They apparently cannot derail the change. However, if sufficiently upset, they may gain influence to resist change.*	Trade associations represent and protect the interests of a specific productive or professional category or the group of people (physical or legal) who carry out an economic or working activity, whether public or private. In this case, those trade associations representing businesses in the Tuscan area, farmers, artisans and traders were invited to the co-planning tables. Trade unions, representing the category of employees, were	Camera di Commercio di Prato e Pistoia Confindustria Toscana Nord Confartigianato CNA Toscana Centro ASTRI Confcommercio Confesercenti Legacoop Confcooperative UIL Prato Futura CISL CGIL Prato Coldiretti Confimprese Prato	Camera di Commercio di Prato e Pistoia Confindustria Toscana Nord Confartigianato CNA Toscana Centro Confcommercio Prato Futura Coldiretti	**Low**	**High**

	also invited to participate.				

Economic actors (enterprises/companies): ***High influence High interest*** *impacted by change and most able to act on it. They may either, support or oppose change*	The system of economic entities is very broad and in our case is made up of companies in the food sector (large-scale retail trade), companies in the local textile sector, the building materials sector, companies dealing with technologies and communication and representatives of the sector tourist. This configuration allowed us to have a rather complete representation of this system.	**GDO** Esselunga Conad Lidl Eurospin Union City Unicoop Firenze Penny **GDS** OBI Decathlon **Textile Sector** Lanificio Mario Bellucci Rifò Manifattura Maiano Lanificio Bisentino Luigi Masi Dell'Orco e Villani srl Pinori Filati Mariplast Gommatex Lanificio Balli Manteco Spa Lanificio Cangioli Marini Industrie Beste Alma Spa Lanificio Picchi Tris & Co Ritorcitura Vignolini Lineaesse Lanificio Pontetoro Spa Lanificio Fortex Spa Lanificio Faliero Sarti Progetto Lana Ciampolini F.lli & C. spa Lanificio dell'Olivo spa Pecci Filati Spa Trafi Creatività CORMATEX Danti Paolo & co. EFFEDUE srl GT 2000 LAIP	**Textile Sector** Lanificio Bisentino Mariplast Gommatex Marini Industrie Vaporizzo Lia srl Next Technology Tecnotessile **Construction Sector** Massimo Guarducci Srl **Technology Sector** TT Tecnosistemi **Food sector** Camst- azienda italiana del settore della ristorazione e dei facility services I due Mastri **Consultancy/ Communication/ Services** Process Factory GreenApes	**High**	**High**

		Maglificio Angorelle srl Pholya srl Rifinizione Vignali Temat snc Vaporizzo Lia srl Nova Fides Texmoda Giolica Antico Feudo Alpacas Lo fo io Papini F.lli & C. Rifinizione Nuove Fibre Spa | Automotive Pontetorto Comistra Wastex Wastex Lab Next Technology Tecnotessile Studio Rami **Construction sector** Isolana Systems srl Varvarito Massimo Guarducci Srl Edilasfalti **Technology Sector** SSE - Sirio Sistemi Elettronici TT Tecnosistemi **Food Sector** Camst (azienda italiana del settore della ristorazione e dei facility services) I due Mastri **Consultancy/ Communication/ Services** Process Factory GreenApes MacoLab Esociety			

		Tourism sector Federalberghi Arthotel			
Professionals: ***Low influence High interest*** *They apparently cannot derail the change. However, if sufficiently upset, they may gain influence to resist change.*	The category of professionals is made up of various representative orders of architects, engineers, labor consultants, lawyers, pharmacists and industrial experts. Construction companies also fall into this category because they are directly connected to the professional categories.	Palazzo delle Professioni Ordine degli Architetti Ordine dei geometri Ordine ingegneri AIGA sezione Prato Nuova edilizia Toscana Edilprogetti Ordine consulenti del lavoro Ordine dei periti industriali UGDCEC Ordine degli avvocati Ordine dei farmacisti Studio Termotecnico Studio Tognocchi Termotecnico	Palazzo delle Professioni Ordine degli Architetti Ordine dei geometri Ordine ingegneri	**Low**	**High**

Bodies, Associations, Organisations Foundations: ***Low influence High interest*** *They apparently cannot derail the change. However, if sufficiently upset, they may gain influence to resist change.*	Third Sector Bodies (or non-profit sector) operate and are located outside the public sector (the State) and the commercial sector (the market). It includes those productive activities that do not seek profit and which operate in various fields (from assistance to people with disabilities to environmental protection, from health and social care services to cultural entertainment). The specificity of these bodies, together with associations, organizations and foundations, lies in their profound knowledge of the territories and their communities of reference.	**Third Sector Bodies** Consulta del Terzo settore Asl toscana centro società della Salute pratese Abitare Toscana Fondo Housing Toscana ARCI MCL Astir Caritas Diocesana Coeso Fondazione Ami Misericordia pubblica assistenza Diocesi di Prato Pane e Rose Opera Santa Rita Save the children | Punto Luce ADA Eccoci Auser Federasma e allergie Genitori Democratici presidente ass. "Insieme per il recupero della Gualchiera di Coiano" Associazione Toscana Paraplegici **Environment and Agriculture** Associazioni vivaisti italiana Associazione mercato Terra di Prato: Animal House	**Third Sector Bodies** Abitare Toscana Fondo Housing Toscana Pane e Rose ADA Eccoci Auser Federasma e allergie Genitori Democratici presidente ass. "Insieme per il recupero della Gualchiera di Coiano" Associazione Toscana Paraplegici **Environment and Agriculture** Associazione mercato Terra di Prato: *Animal House* Recuperiamoci Onlus Legambiente CAI Associazione Komorebi Parco Agricolo Prato APS Slow food **Energy Sector** Anter **Sports bodies and associations** Gispy Rugby Prato	**Low**	**High**

		Apicoltura Primavera di Luca Gori Casini Andreina Corboli ss (Stefano) Fattoria Le Ginestre ss Felice Agricoltura ss Fiaschi Roberto Fiorenzo di Samuele Biancalani Fonte de piani ss Guazzini Andrea Il Leccio di Manuela Capaccioli Il Poggiolino ss La bottega del miele di Iacopo Minuzzo La Corte del Maglio di Emilio La Corte Luca Squilloni – Birrificio Granducato Macelleria Mannori Montaneta SS Panificio Cocciardi Paolo Colzi Sale Giovanni Santamaria di Niccolò Fiaschi Selva ss UNIONE PRATESE AGRICOLTORI Pane di Luna Aps Associazione Gran Prato Bloom project Azienda Agricola SantaMaria CORENAP Gastronomia Toscana Recuperiamoci Onlus Legambiente CAI Conser	**Cultural association, museums** Fondazione Museo del Tessuto **Citizen Committees** Comitato Cittadini Centro Storico		

		WWF Vannucci Piante Associazione Komorebi Parco Agricolo Prato APS Slow food CIA **Energy Area** Anter World Energy Council Italia **Sport bodies and association** Primo Pizza Bike Polisportiva 29 2A srl Polisportiva AC Prato Prato AIA FIGC Arco Bal Atletica Prato Polisportiva Aurora Verag Azzurra Nuoto Nannini/Mugnaioni CGFS Riccardo Chiti CSI Prato CAI Karate Ni Hon Kai Alfredo Albiani Ciclistica Viaccia Officine sportive GS Coiano Pattinaggio Super Sport Family Judo ETA Beta Dance SG Etruria Podistica Narnali Podistica pratese			

		Scherma Prato Special Team Prato Skating Club Prato Street Basket Prato Sub Prato Super Sport Family CT Paolo Ciampi TC Bisenzio Tennis Club Prato Tennis Costa Azzurra Circola Tennis Etruria Tennis Tavolo Prato 2010 Gispy Rugby Prato **Cultural associations, museums** Fondazione per le Arti Contemporanee in Toscana / Urban Center Fondazione Teatro Metastasio Fondazione Museo del Tessuto PalazzoPretorio Officina Giovani Manifatture Digitali Cinema Camerata strumentale Studio Corte 17 Fonderia Cultart Factory Lab Factory Tac Metropopolare Brigata Ballerini Microcosmo CUT Sedici Estuario project space Zappa			

		Dryphoto ASS. CULTURALE JOHN SNELLINBERG Associazione Culturale "Mettiamoci all'Opera PiùPrato Ass. Cult Amaltea Controtempo Riciclao Binario di Scambio Altro Teatro TeatrificioEsse Infabula Compagnia Pratesi Teatro Fondazione Politeama Opera del Duomo FLOD **Citizen committees** Comitato Via Pomeria Associazione Quelli di Piazza Ciardi Consorzio Santa Trinita Condominio Lippi Left Lab Confraternita delle Bombette del Dagomari Comitato Cittadini Centro Storico			

Training system: ***High influence High interest*** *impacted by change and most able to act on it. They may either, support or oppose change*	In this case, the training system concerns primary schools under municipal and provincial jurisdiction, some local universities and the boys and girls municipal council committee, an initiative of the Municipality of Prato for concrete citizenship education. A specific co-planning section was organized for the latter actor.	**Primary School** Istituto Comprensivo Marco Polo Istituto Comprensivo Pacetti Istituti Comprensivo Mascagni Istituto Comprensivo Nord Istituto Compresivo Claudio Puddu Istituto Comprensivo Primo Levi Scuole Pier Cironi Istituto Comprensivo Gandhi Istituto Comprensivo Don Milani Scuola Primaria Carlo Collodi (Malaparte) Istituto Comprensivo Convenevole Istituto Comprensivo Roberto Castellani Istituto Comprensivo Lippi Istituto Comprensivo G.B. Mazzoni Istituto Comprensivo Malaparte Conservatorio San Niccolò Santa Caterina De' Ricci Istituto Maria Immacolata Istituto Cuore Immacolato di Maria Casa Educazione Lavoro Istituto San Giuseppe Istituto Don Bosco	**Boys and Girls City Council Committee** **University** PIN Unifi, Università degli studi di Firenze	**High**	**High**

		Istituto San Giovanni Bosco Convitto Nazionale Statale **Boys and Girls City Council Committee** **University** PIN Progettomadeinitaly Unifi, Università degli studi di Firenze			
Public Administration: ***High influence High interest*** *impacted by change and most able to act on it. They may either, support or oppose change*	**Public Administration** was convened to represent the various departments relating to the four macro topics covered: energy efficiency, sustainable mobility, circular economy, agriculture, land use and urban forestry.	**Municipality of Prato** Dirigente servizio governo del territorio Servizio Urbanistica, Transizione ecologica e Protezione Civile Area cultura e promozione della città verde pubblico Funzionario tecnico Servizio Urbanistica, Transizione ecologica e Protezione Civile Responsabile unità organizzativa presso Servizio sviluppo economico, SUEAP e Tutela dell'ambiente Servizio sviluppo economico Assessore alla Polizia Municipale, sicurezza urbana e mobilità Assessore all'urbanistica,	**Municipality of Prato** Servizio Urbanistica, Transizione ecologica e Protezione Civile Area cultura e promozione della città Verde pubblico Funzionario tecnico Servizio Urbanistica, Transizione ecologica e Protezione Civile Responsabile unità organizzativa presso Servizio sviluppo economico, SUEAP e Tutela dell'ambiente Servizio sviluppo economico Assessore alla Polizia Municipale, sicurezza urbana e mobilità Assessore all'urbanistica,	**High**	**High**

		ambiente ed economia circolare Assessore al bilancio, sviluppo economico, innovazione e agenda digitale, personale Servizio Mobilità e Infrastrutture Energy Manager Architetto immobili comunali Area transizione ambientale e resilienza urbana Agronomo - Comune Prato Responsabile "edilizia sportiva" Funzionario tecnico - area formazione Ufficio statistica - Comune di Prato Direzione generale Direzione generale Servizio Edilizia scolastica e sportiva	ambiente ed economia circolare Assessore al bilancio, sviluppo economico, innovazione e agenda digitale, personale Servizio Mobilità e Infrastrutture Energy Manager Architetto immobili comunali Area transizione ambientale e resilienza urbana Agronomo - Comune Prato Responsabile "edilizia sportiva" Ufficio statistica - Comune di Prato Funzionario tecnico - area formazione Direzione generale Direzione generale Servizio Edilizia scolastica e sportiva		
Banks and credit and savings institutions: ***High influence High interest*** *impacted by change and most able to act on it. They may either, supportor*	**The banks** (or credit institutions) and the related foundations were summoned for their financial intermediation activity, and therefore for their role in providing economic-financial support to the ecological transition	Banca Etica Banca Intesa Fondazione Cassa di Risparmio di Prato BNL Banca cambiano Chianti Bianca Unicredit Credit Agricole Banco Fiorentino		**High**	**High**

oppose change					

A-3.2: Systems & stakeholder mapping

The barriers identified during the process divided into the co-design and portfolio co-design phases (described in detail in Module A-3.3) are presented below and grouped according to two criteria:

- macro themes to which they belong (energy efficiency, sustainable mobility, circular economy, agriculture, land use and urban forestry);
- lever of reference systemic change (the lever represents the area of intervention on which it is necessary to act to overcome that same barrier).

The main results and suggestions that emerged from the reconstruction of the state of the art are also reported.

ENERGY EFFICIENCY

Systemic Lever of Change**: Education & Training**

- In all levels of education from school to university, there is an absent
- integrated training on energy efficiency;
- Professionals do not have the opportunity to update their skills;
- There are no adequate training courses for young professionals entering the job market;
- Systemic Change Lever: Capacity Building
- Citizens, companies and private actors find it difficult to find their way around energy efficiency policies.

Systemic Change Lever: **Awareness Raising**

- The Chinese community, an integral part of the city's productive reality, is not sensitised to the issue of energy efficiency;
- Lever of systemic change: Regulation, legislation & procurement
- Bureaucracy prevents proper dialogue and thus understanding of practices;
- The absence of a stable regulatory framework does not facilitate investment planning
- on energy efficiency especially by private individuals;
- Lever of systemic change: Fiscal measures
- There are no credit measures for companies to encourage energy efficiency actions;
- Lever of systemic change: Financial support
- There is a lack of incentives for the removal of asbestos from roofs and subsequent replacement with photovoltaic panels;
- Lever of systemic change: Data & Tech
- Digitisation of procedures and shared platforms are missing;
- The non-publicly available emission inventory hinders the definition of
- effective strategies;
- There is no mapping of public spaces to assess the installation of new photovoltaic systems (energy for businesses and the city in general)

Systemic Change Lever**: Convening & Partnerships**

- There is a lack of experience in setting up energy communities;
- There is a lack of a vision of the freight village as a central player in building partnerships, including inter-provincial partnerships;
- there is a lack of experimentation on the interport as a pilot subject for innovative and sustainable solutions.

STATE OF THE ART

Main results

- There are numerous private initiatives related to energy efficiency and transversal to all the sectors surveyed, from punctual interventions such as relamping, home automation, boiler replacement, to more complex investments, such as the installation of photovoltaic systems, the replacement of more energy-efficient production machinery or insulation interventions. Where these interventions have not already taken place, it is planned to implement them in the short term (2-5 years);
- much attention is paid to data: in many cases, technologies (from domotics, to the digitisation of production processes, to the use of drones) have already been implemented to monitor consumption, dispersion and emissions. Where the technology is not already in place, plans are being made to implement it;
- there emerges a marked awareness of the need to set up networks, including intersectoral ones, both with a view to establishing energy communities and new partnerships (including public-private), both to access calls for tenders and funding and with a view to energy optimisation (consortia and cooperatives);
- regulations and procurement play a key role, both with a view to cutting red tape (e.g. for energy efficiency measures) and with a view to regulatory stability, which promotes investment planning also in the long term;
- there is a lack of adequate training in energy efficiency in practically all the sectors questioned, which is indispensable both for accessing financing and procedures related to energy efficiency and for re-skilling for new job opportunities;
- working on awareness and communication emerges as a determining factor, to be strengthened and extended in the long term

Suggestions accepted:

- allocate suitable public spaces for the installation of renewable energy plants to produce clean energy for distribution to the city;
- implement the use of hydrogen accumulators;
- promote energy communities, including cross-sectoral ones;
- the figure of the energy manager could represent the link between the different sectors, also with a view to setting up energy communities;
- it is important to work on the awareness and education of the Chinese community on energy efficiency issues.

SUSTAINABLE MOBILITY

MAIN BARRIERS

Systemic Change Lever**: Awareness Raising**
- There is a lack of a general city culture around the issue of sustainable mobility (resistance to abandoning the car for travel)

Systemic Lever of Change**: Education & Training**
- Technicians and managers often do not participate in training courses;
- Adequate training on the subject is lacking at all levels of education and training;

Lever of systemic change**: Communication**
- Communication on sustainable mobility issues is inadequate (it

is necessary to talk about active rather than slow mobility

Systemic Change Lever**: Convening & Partnerships**

- The absence of dialogue between business and public administration is not conducive to micro-mobility;
- The absence of dialogue between neighbouring municipalities does not favour effective inter-municipal and inter-provincial sustainable mobility strategies

Lever of systemic change**: Financial support**

- The absence of adequate and affordable funding does not facilitate the transition to sustainable mobility;
- The absence of incentives does not facilitate corporate car sharing.

Lever of systemic change: **Infrastructure (Physical assets)**

- The discontinuity between the city's cycle paths is not conducive to their use;
- The lack of security discourages micro-mobility and pedestrian mobility;
- Public transport infrastructure is inadequate and discourages its use;
- A plan for inter-municipal and inter-provincial connections for sustainable mobility (Prato-Florence tramway) is missing;
- There is a lack of an inter-municipal and inter-regional logistics management plan that promotes sustainable mobility;
- Architectural barriers do not favour the use of public transport (especially for the disabled).

Lever of systemic change: **Data & Tech**

- The absence of a shared platform for mobility data collection does not favour the
- formulation of effective strategies;
- The absence of data-driven strategies does not allow the formulation of an adequate action plan for infrastructure enhancement.

STATE OF THE ART

Main results:

- a number of initiatives already underway in terms of awareness-raising, communication and capacity-building emerge;
- a culture of sustainable mobility is still struggling to take hold among the citizenry;
- the absence of adequate infrastructure is the main critical issue in the transition to sustainable mobility, both with respect to micro-mobility and pedestrianisation;
- security is a frequently evoked theme;
- the freight village represents a strategic element of logistics, to be conceived not only as a link between the city and its districts, but also from an inter-provincial perspective;
- the need to connect the logistics of the textile district to the railway system emerges, from an inter-provincial and inter-regional perspective. Here again, the freight village is a strategic regional hub;
- data and technology are a key tool for sustainable mobility that is still too little used;
- the training of the mobility manager is a central issue. Indeed, the mobility manager represents a strategic linking figure in the creation of synergies and partnerships;
- The strengthening and promotion of public transport and its usability are unanimously demanded by all parties questioned.

Suggestions accepted:
- reconnecting the cycle paths, with particular attention to safety and the issue of signposting (the radio-centric road system does not facilitate movement);
- increase and improve connections between the city and the suburbs for sustainable mobility;
- promote appropriate training courses for technicians and managers;
- More racks and greater safety are essential elements in the promotion of cycling.

CIRCULAR ECONOMY, AGRICULTURE, LAND USE AND URBAN FORESTRY

MAIN BARRIERS

Lever of systemic change: **Infrastructure (Physical assets)**
- Poor maintenance of the water system causes leaks, water waste and dispersion;
- The poor circular management of sludge does not allow its reuse;

Lever of systemic change**: urban/firm assessment & monitoring**
- There are no alternative uses for pruning waste other than landfilling;
- The lack of anaerobic process management of the sludge to be recovered does not allow its reuse in digestion processes;
- Water resources are scarce for the management of urban greenery;
- The industrialisation of food culture is not conducive to sustainability;
- Packaging represents an element of great environmental impact.

Systemic Change Lever**: Awareness Raising**
- The lack of a sustainability culture does not encourage virtuous behaviour;
- The loss of agri-food culture, territory and biodiversity does not favour short and sustainable supply chains.

Lever of systemic change**: Engagement**
- Not feeling part of the natural system hinders change towards a culture of sustainability

Systemic Lever of Change**: Education & Training**
- The absence of adequate training does not foster a systemic approach and planning capacity, across all sectors;
- Environmental education does not go beyond technicalities;
- Lack of knowledge about climate change measures hinders new practices;
- The public administration system that does not allocate new personnel resources to sectors on the basis of specific competences is a waste of human resources and a loss of opportunities for growth;
- PA human resources have poor transdisciplinary and complexity management skills;
- PA human resources are rarely specialised;
- There are few pilot projects and little experimentation does not allow learning by doing.

Systemic Change Lever**: Convening & Partnerships**
- Administrative silos hinder dialogue and efficient management of new practices in support of the ecological transition;

- There is a lack of cross-sectoral dialogue between the different actors in the city;
- The loss of the relationship between citizenship and PA is not conducive to change;
- There is no dialogue along the municipal waste management chain;
- There are gaps in the network of professionals that hinder networking in terms of skills and job training;
- Cross-sectoral working tables are missing;
- There is no listening channel between companies and the European Community on the new regulations to be
- adopt.

Lever of systemic change: **Data & Tech**

- Failure to digitise archives often results in data loss;
- The absence of design in BIM does not allow for waste simulation;
- The absence of shared platforms hinders the change towards sustainability;
- The lack of measurement and accounting of municipal waste does not allow for an optimal management of the flows;
- The lack of an up-to-date database on sustainable company profiles - to which rewards can be assigned - is not conducive to sustainability practices in this sector.

Lever of systemic change**: Regulation, legislation & procurement**

- Textile supply chain certifications are an obstacle in small companies due to the high complexity;
- The lack of regional regulations on sustainability is not conducive to change;
- The absence of certification to protect Italian companies is not conducive to their competitiveness;
- GRS certification does not cover textile by-products;
- There is a lack of European rules to replace GRS certification;
- There is a stalemate between EU regulations in the textile sector and their transposition in Italy;
- There are technical and regulatory limitations in end-of-life product management in the textile sector - technical chemicals are not easily recyclable and recoverable;
- The lack of a clear definition of 'Waste' does not support circularity: existing definitions are subject to interpretation;
- The absence of an alternative by-product category hinders reuse in the food sector;
- The legislation defining prunings as special waste does not allow their reuse;
- Failure to recognise nature as a legal entity does not foster a culture of sustainability;
- The management of the agro-forestry plan is sporadic and sectoral;
- There is no regulation on the reuse of food waste;
- The technical health regulations on feeding create a food waste barrier (it immediately becomes waste);
- The date of minimum durability, which is regulated at European level and can be read at national level, is unsustainable, given the expiry date only for fresh products;
- The EPR regulation on the extension of product liability to the producer is not easily available.

STATE OF THE ART
Main results

- In general, there are numerous initiatives that homogeneously cover all three cycles of the circular economy (close, reduce, extend);
- Particular attention is given to the use of sustainable raw materials, reuse of materials

and promoting industrial symbiosis actions (use of waste for other sectors);
- the theme of water dispersion and its reuse emerges in all the categories questioned;
- a strong sensitivity and attention to the agri-food chain emerges, with significant short supply chain experiences. In some cases, the environmental sustainability of supply chains is integrated with the social sustainability of fragile subjects;
- a vibrant network of more or less formal partnerships has already formed especially around the food supply chain and against food waste, but solid partnerships are needed to scale up solutions to create significant impacts;
- the city is working to strengthen the agri-food sector in terms of sustainability;
- there is a need to work on the establishment of by-product supply chains, to be extended in a systemic chain from producer, to processor, to local and circular trade;
- A central theme is training in all the categories questioned, both to raise awareness and build skills necessary for systemic and transdisciplinary planning, and to develop more appropriate skills (beyond technicality) also in terms of naturalistic management of forest spaces for CO_2 compensation;
- traceability of materials on shared platforms is a necessity with a view to building industrial symbiosis and sustainable supply chains;
- regulations constitute a significant barrier to the implementation of good circular economy practices.

Suggestions Accepted

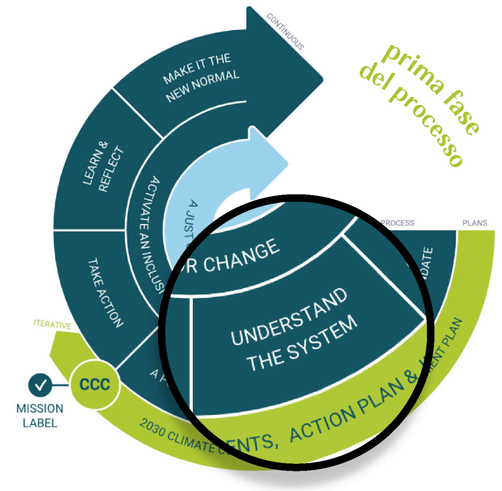
- promote advanced and systemic training, beyond technicalities;
- set up public-private partnerships to foster food chains and industrial symbiosis;
- increase the use of shared technologies and platforms;
- overcoming the many regulatory barriers that prevent the reuse, reduction and extension of materials, both technical and natural.

A-3.3: Description or visualisation of participatory model for the city climate neutrality – textual and visual elements

The undertaken Participatory process
The co-design process was conceived and implemented in line with the systemic approach of **Net zero cities** (fig.1) which suggests acting in a collaborative manner, seeking to understand, first of all, the interdependencies between the actors of the territory and their actions, in order to explicate the barriers that hinder change (**understand the system - Phase 1**) and to co-create a portfolio of actions (**co-design a portfolio - Phase 2**) that support the overcoming of those same barriers. Aware of finding ourselves within an exploratory path and strongly dependent on the context of reference (the city of Prato), we worked on a process that would allow us to create **synergies between public administration, stakeholders and citizenship, in order** to concretely involve the collective intelligences along a transition path that will lead us to the implementation of meaningful impact pathways towards climate neutrality.

Fig. 1 - La mappa della transizione climatica di Net zero cities

Fase 1 | Understand the system: Focus group



In this first listening phase, we organised focus groups associating the various actors and stakeholders in the area (Fig.2) with the macro-issues on which the city's climate neutrality strategy is built: **energy efficiency, sustainable mobility, circular economy, agriculture, land use and urban forestry**.

The categories questioned through the numerous listening round tables were as follows:

- a **first group** consisting of the **Municipality's subsidiaries, trade associations, banks and foundations, research institutes, large-scale retailers, companies, agricultural bodies and associations linked to the short supply chain, farms, professionals, environmental associations, bodies linked to mobility and public administration** (land government, roads service, town planning government, agriculture and environment);
- a **second group** consisting of **trade associations, businesses and start-ups, sports clubs, traders, citizens' committees, public administration;** a **third group** consisting of **third sector bodies, and public administration**; a **fourth group** consisting of the **boys' and girls' municipal council**.

To construct the Prato Carbon Neutral tables within the focus groups, **tables already active on other projects of the Municipality of Prato** were used (Table Governance PCC, Section agriculture and short supply chain PCC, Pathway Structural Plan, Pathway 'We the centre', Table with school directors periodically coordinated by the Department of Education). This made it possible to involve stakeholders accustomed to confronting each other, provoking a more fruitful dialogue and activating fertile ground from which to extrapolate, as early as this preliminary phase, proposals and suggestions to be fed into the subsequent workshop phase.

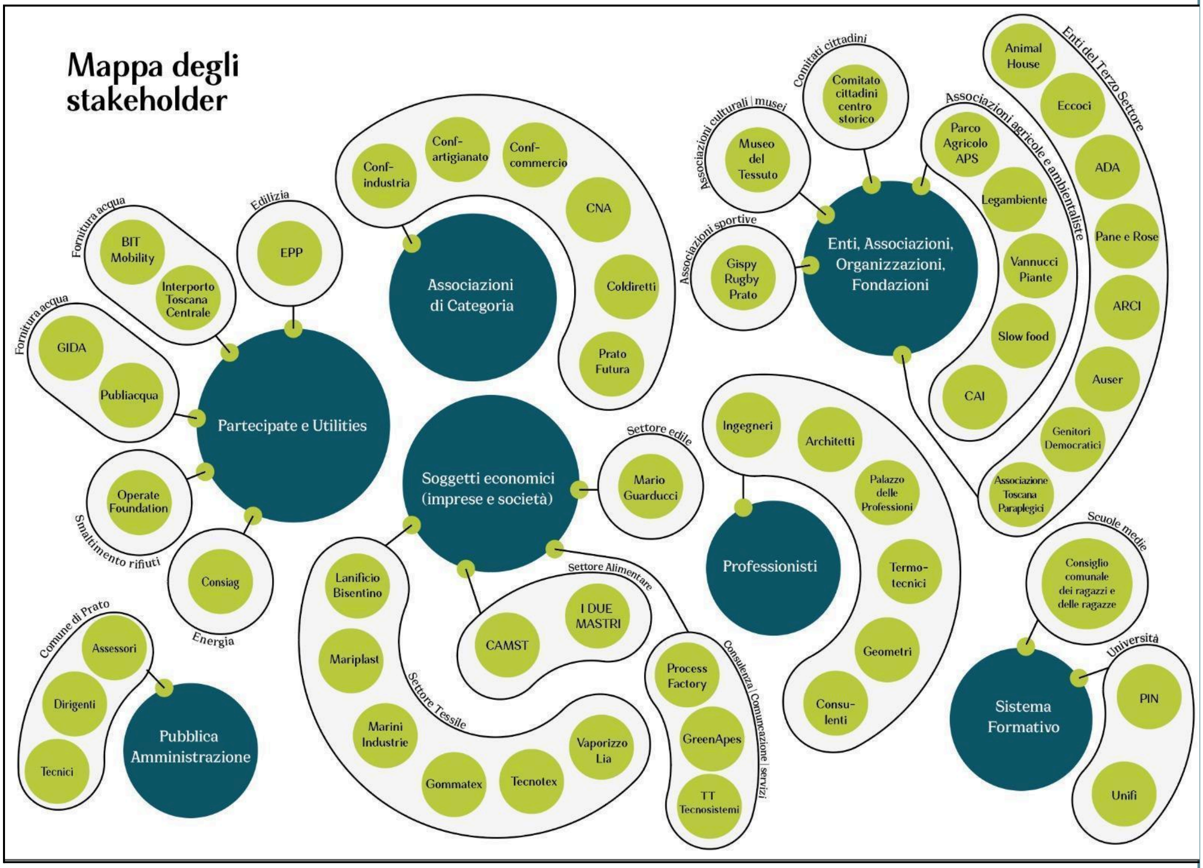


Fig. 2 - Territorial actors participating in the Focus Group

The main objective of this first phase was to identify the problems and a first category of barriers to change towards climate neutrality. For this purpose, the process was organised on the basis of two macro-actions:

1. an initial introductory part, linked to the subject matter, was presented by the **administration and the various managers involved in the subject matter**, by means of a summary restitution of both the framework policies and the concrete actions carried out within that framework;
2. a workshop phase introduced by an initial **divergent action**, in which the various actors were asked to **construct and visualise the state of the art** (with respect to the category they represented) through a specially designed tool (fig. 3), which would help us to return not only a snapshot of the initiatives underway (now), but also possible actions being implemented or planned in the next two years (near) and strategies to aspire to in the next five to eight years (next). At this stage, we also tried to analyse

and understand relevant policies and regulations, especially at the local and regional level, relevant to the city's transition to climate neutrality.

3. a second convergent action, supported by a specific tool (fig. 4), guided us towards the definition of concrete problems, which were in many cases the basis for a plenary cross-sectoral discussion between the different sectors present at the working tables.

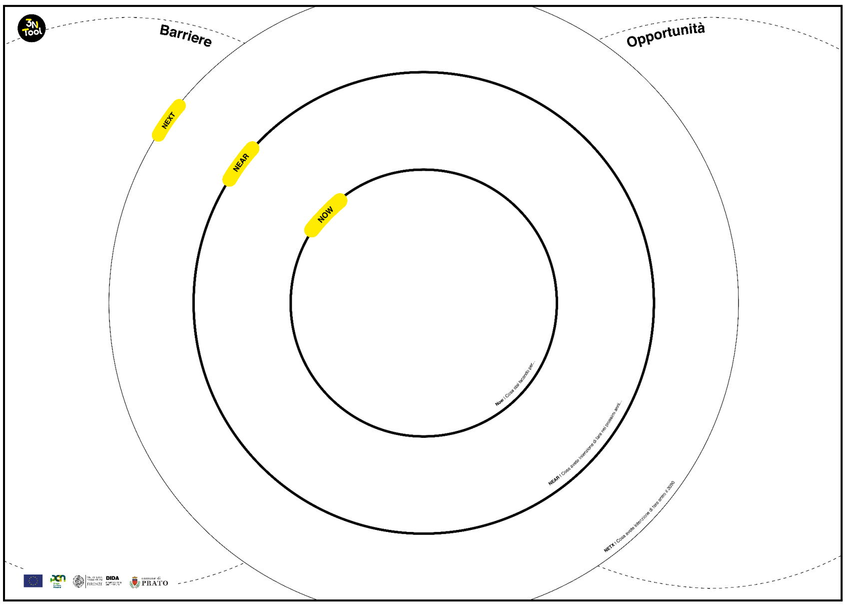


Fig. 3 - Il 3N tool

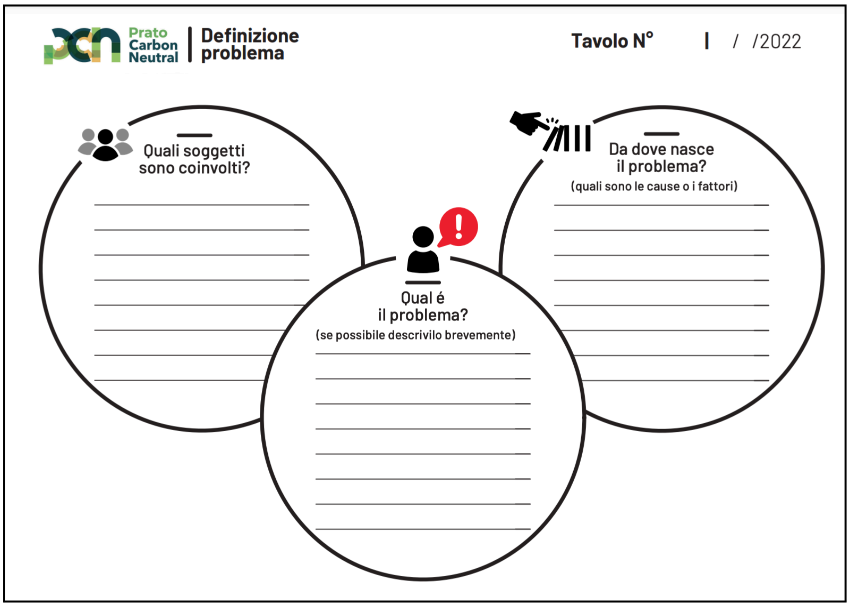


Fig. 4 - The problem definition tool

With particular reference to the co-design meetings with the **Boys' and Girls' City Council**, two specific meetings were organised. The first meeting was aimed at stimulating boys' and girls' awareness and involvement, in order to reconstruct with them a state of the art around the topics addressed, aimed at answering the question "what am I doing about the topic of energy efficiency/sustainable mobility/circular economy/agriculture, land use and urban forestry", through the 3N tool and a storyboard (fig. 5). In the second and final meeting, we expanded the awareness dimension by asking each of the participants to identify with one of the roles proposed through the tool inspired by De Bono's 6 hats (fig. 6). The tool was designed to stimulate empathy and different types of thinking according to the role assigned, bringing out the creative abilities of the young people and youth participants, and making concrete proposals related to the topics discussed.

3 Part B – Pathways towards Climate Neutrality by 2030

Part B represents the core of the Action Plan, shaped by local authorities, local businesses and stakeholders, comprising of the most essential elements: scenarios, strategic objectives, impacts, action portfolios and indicators for monitoring, evaluation and learning.

3.1 Module B-1 Climate Neutrality Scenarios and Impact Pathways

Module B-1 "Climate Neutrality Scenarios and Impact Pathways" should list impact pathways, early and late outcomes and direct and indirect impacts (co-benefits) according to and adapted from the NZC Theory of Change and the AP Guidance – clustered by fields of action.

Connection between context and planned actions

1. Strategic assessments

The policy adopted for the evaluation of emission reduction strategies to achieve the net zero objective by 2030 was based on the results obtained from the GHG inventory conducted to reconstruct the 2019 baseline (Module A-1), taking into account the opportunities and barriers that emerged in the co-planning and portfolio co-design phase (Form A-3) and further assessments conducted in the area. Furthermore, in defining the plan, particular emphasis was given to the active involvement of the community in the design and implementation of these strategies, ensuring that they are responsive to the needs and perspectives of citizens.

In detail, to address these challenges effectively, a multi-criteria approach has been structured, adopted as a guideline for the definition of sectoral emissions reduction objectives and the related strategy implemented for the definition of the Impact Pathways. Based on this information, a plan was then developed that gives maximum priority to emission reduction strategies, pushing the global target to 83% compared to the 2019 baseline value, with the aim of minimizing the residual component of emissions. Finally, to compensate for this residual component, actions linked to the production of electricity from renewable sources and reforestation programs have been envisaged.

The criteria used to identify improvement potential for each sector are detailed below, adopting a qualitative scoring approach:

Environmental Impact: To evaluate the environmental impact, three score scales were evaluated (high, medium, low) based on the percentage of incidence of emissions from the specific sector on the 2019 EIB:

High: Emissions ≥20%

Medium: Emissions included in the 10%÷20% range

Low: Emissions ≤10%

Barriers: As regards barriers, three score scales were evaluated (high, medium, low) based on the number and complexity of the results that emerged from the preliminary analysis with stakeholders and assessments conducted in the area in terms of obstacles to overcome for each sector with reference to the themes of energy efficiency, circular economy, sustainable mobility, agriculture, land use and urban forestry:

High: Barriers represent numerous significant and complex challenges to address. They may include technological, financial or political obstacles that require strategic interventions and considerable resources to overcome.

Medium: Barriers challenges of moderate size and complexity. They may include obstacles that require some effort to overcome, but which can be addressed with a well-structured action plan and adequate resources.

Low: Barriers represent relatively fewer challenges and are easier to overcome. They may include barriers that require only limited interventions or relatively fewer resources to successfully address.

Opportunities: As regards opportunities, three score scales were evaluated (high, medium, low) based on the suggestions that emerged in the co-planning and co-design phases in addition to further specific assessments conducted in the area in terms of opportunities offered by the sector in terms of adoption of possible innovative technologies, access to economic incentives and behavioral changes:

- **High:** Opportunities represent interventions or strategies that offer high potential for reducing CO2 emissions. These can include the implementation of innovative and highly efficient technologies, the potential for energy production from renewable sources, the adoption of ambitious public policies and significant economic incentives, as well as large-scale behavioral changes.
- **Medium:** Opportunities indicate interventions or strategies with moderate emissions reduction potential. They may involve the adoption of existing but less advanced technologies, medium potential for energy production from renewable sources and public policies and economic incentives of limited scope, as well as behavioral changes on a more limited scale.
- **Low:** Opportunities represent interventions or strategies with relatively limited emissions reduction potential. These may include actions that lead to only small improvements in efficiency or resource use, limited potential for energy production from renewable sources and public policies or economic incentives of limited scope, as well as behavioral changes at individual or local scales.

La tabella seguente mostra i risultati della valutazione multicriterio, con l'evidenza degli scoring identificati per ogni criterio in riferimento ai singoli settori:

Sector	Environmental impact	Barriers	Opportunity
Residential	High	High	Medium
Industrial	High	Medium	High
Municipal	Low	Medium	Medium
Tertiary	Medium	High	Medium
Agricultural	Low	High	High
Mobility	High	High	High
Waste	Low	Medium	Medium

Table 10 Evaluation of the sector's potential.

Finally, all these assessments were integrated to identify the main areas of intervention and the most effective strategies to adopt to reduce GHG emissions and mitigate environmental impacts. For example, a sector that has a high environmental impact, high opportunities for improvement (e.g. obsolete technologies, ease of access to incentives, etc.) and barriers that can be easily overcome (through specific targeted actions) represents a top priority on which to focus on more challenging objectives. in terms of emissions reductions by 2030.

Below are the strategic assessments conducted for each sector, which were used as a guide for planning:

Residential Sector: The residential sector represents a significant item in terms of GHG emissions (24.53%), mainly linked to energy consumption. Therefore, the actions identified in the Impact Pathways were mainly focused on strategies to reduce the energy needs and increase the energy efficiency of domestic users, which include both technological interventions and behavioral changes. The main barriers here are resistance to change in energy consumption habits and the costs associated with improving the energy efficiency of buildings.

Industrial Sector: Industry, with its significant environmental impact (equal to 23.97%), represents an important challenge in the transition towards sustainability. In the Prato area, there are ample opportunities for innovation, linked to the presence of energy-intensive companies with potential for improvement in terms of technologies, also thanks to the specific incentives provided for industrial activities. These can lead to a reduction in emissions through the optimization and improvement of production processes, as well as through the installation of photovoltaic systems on large industrial areas. From this point of view, also in light of the obligations established by the new legislation in terms of sustainability balance sheets, particular importance in planning was reserved for the definition of climate neutrality objectives and plans by a sample of energy-intensive companies. The main barriers that emerged in the co-planning phase concern the difficulty of companies in orienting themselves on energy efficiency policies and the need to raise awareness among the Chinese community (an integral part of the city's production reality) on sustainability issues (with particular focus on energy efficiency energy).

Municipal Sector: Although the Municipality itself has a relatively low footprint in terms of direct emissions (1.05%), it plays a crucial role in promoting sustainability at a local level. The actions planned for this sector mostly include activities linked to energy efficiency interventions and the redevelopment of public buildings and sports facilities managed by the Municipality. In this sector, planned interventions for Public Residential Buildings (ERP) were also considered, the benefits of which were however accounted for within the Residential Sector. Barriers identified here may include bureaucracy and lack of funding for environmental investments. However, the Municipality has the opportunity to play a leadership role in promoting sustainability through innovative policies and pilot projects.

Tertiary Sector: The tertiary sector, which includes services and trade, has an average impact in terms of emissions (15.19%). Based on the study of the context and the actual opportunities, in this case actions were mostly planned related to the electrification of thermal consumption and the reduction of energy needs. The main barriers here are resistance to change in energy consumption habits and the costs associated with improving the energy efficiency of buildings.

Agricultural Sector: Agriculture, although it has a limited impact on direct emissions (0.42%), represents a key sector especially in terms of energy production from renewable sources. From this point of view, a preliminary evaluation was conducted on the Prato area aimed at evaluating the actual potential for installing agrivoltaic systems, also taking into account the nature of the crops present. Furthermore, the envisaged strategy aims to reduce heat consumption linked to the use of fossil fuels in agricultural vehicles and the adoption of more efficient agricultural practices. Possible barriers considered include dependence on conventional agricultural practices and lack of access to sustainable markets.

Mobility Sector: Mobility represents one of the sectors with the highest environmental impact (32,19%). However, one of the main challenges in this sector is the high dependence on private vehicles powered by fossil fuels. In this case, given the relevance of the sector and the high opportunities for improvement, an articulated plan of actions has been structured that generally aims at disincentivizing the use of private vehicles by improving the offer of local public transport services (also through infrastructural improvements and the type of services offered) combined with soft mobility strategies. The plan also envisages a gradual transition to the use of electric vehicles for the remaining share of private internal combustion vehicles. In this context, the possibility of hydrogen-powered vehicles has also been investigated, as well as the identification of speed-limited zones in the context of urban roads.

Waste sector: The waste sector has a relatively low impact on direct emissions of 2,64%. In addition, the current solution of separate waste collection represents an excellent adaptation to the context of Prato and It does not seem to offer further room for improvement. Consequently, the overall strategy of actions adopted within the plan focuses on the installation of photovoltaic systems and the purchase of green energy.

With regard to the renewable energy share, a spatial study was conducted focusing in particular on photovoltaic technology (being the one with the greatest potential, as shown in the results shown above in Table 9). The strategy included in the plan envisages the sizing of plants according to two approaches:

When specific studies or detailed information on the area were available, calculations were made considering the maximum potential of the relevant sector. For example, in the industrial sector, reference was made to a study conducted on the potential for photovoltaic installation in Macrolotto 1, Macrolotto 2 and Artisan Areas. Other examples are in the public sector, where a study was conducted on the potential for photovoltaic installation on a landfill site, and in the mobility sector, through a study on usable parking areas. The application of this approach therefore leads to a production of electricity from photovoltaics that could exceed the requirements of the relevant sector.

In the absence of detailed information, production from photovoltaics was sized to cover 20% of the residual electricity needs of the reference sector by 2030. The demand was estimated by considering both the reduction in energy consumption linked to the energy efficiency actions included in the plan, and the increase in consumption linked to electrification actions (e.g. heat pumps, electric cars, induction hobs, etc.). The value of producibility thus estimated was finally validated by considering the percentage ratio between the equivalent covered surface area and the total roof surface area in the reference sector.

In particular, we emphasize the importance of adopting a dynamic approach to ensure the continued effectiveness and relevance of the plan. This dynamism will be crucial to ensure that the plan is able to adapt and respond in a timely manner to changing needs and challenges that may emerge over time. To achieve this objective, annual monitoring will be carried out on the actions foreseen within the plan, constantly adapting them to the dynamic evolution of society.

To achieve this, it will be essential to implement an active process of monitoring and analyzing feedback from stakeholders involved in the implementation of the plan and the Prato community, as described in the next section. This process of monitoring and analyzing feedback will be continuous and iterative, allowing for an ongoing evaluation of the plan's performance and identifying any areas where improvements can be made. It will be crucial to be sensitive to the needs and perspectives of the community, incorporating their voices into the decision-making process and in updating the plan's strategies..

2. Citizen Involvement Plan

In the context of the Municipality of Prato, all the actions prepared within the *Impact Pathways include* specific strategies to involve citizens through awareness-raising campaigns, webinars and other initiatives. Regardless of the transition phase in which the city finds itself, its inhabitants are recognised as key drivers to catalyze significant changes. Prato's history is marked by a long tradition of civic participation and community engagement, factors that provide a solid foundation for involving citizens in decision-making processes and climate neutrality initiatives.

In addition to investments in physical infrastructure, the mobilization of advanced policy-making and governance capacities plays a central role in adequately engaging Prato's local communities.

Actions initiated in transition pathways carefully consider the contribution and experience of Prato citizens, as they hold a wealth of resources, knowledge and networks that can be activated to address complex challenges related to environmental sustainability. Moreover, new technologies can act as catalysts to further enhance citizen participation, although it is crucial to understand and systematize current and emerging practices. In this context, citizen involvement in Prato is not only desirable, but becomes an indispensable component to ensure an accelerated and socially supportive transition to climate neutrality.

In the context of the city of Prato, the adoption of innovative methodologies for citizen involvement plays a fundamental role in the process of co-creation and design of climate neutrality initiatives.

From this point of view, the Municipality may consider adopting some of the following methodologies:

Citizens' Climate Assembly: The Citizens' **Climate** Assembly is a democratic instrument that aims to directly involve a randomly drawn sample of citizens to help propose and implement municipal policies. The assembly is deliberative, i.e. it is based on a method of dialogue and argumentation among participants. It is convened at most once a year, on a temporary basis, on a particularly relevant issue, mainly on climate-related topics within the competence of the Municipality of Prato.

Distributed Dialogue: This approach involves a series of conversations organized by stakeholders in different geographical areas and through different media, including online forums. The commissioning body of the distributed dialogue is responsible for selecting the policy issue, providing clear questions and background information, as well as tools for planning and facilitation. This method aims to overcome the isolation of different groups and create a clear channel between them, collecting the results of conversations to feed into the decision-making process.

Future Workshops and Future Tours: These workshops aim to form a vision of the future and identify objectives and problems, involving a group of participants in formulating concrete solutions and proposals for action based on their experiences. This method proves particularly effective for addressing local or neighboring issues and planning specific local actions.

World Café: This method makes use of an informal, café-like setting where participants discuss an issue in small table groups through several rounds. Each table has a host who summarizes previous discussions to new participants. Emerging main ideas are discussed in plenary sessions to assess follow-up possibilities.

Fishbowl: This method involves speakers, seated in the center of the room together with a facilitator, initiating the conversation, while other participants listen from the periphery. The discussion is open to anyone who wishes to join in, promoting a dynamic and inclusive dialogue.

Decidim: Decidim is an open-source digital platform for citizen participation and participatory democracy. Adopted by several cities, including Barcelona, Decidim allows citizens to propose ideas, participate in polls, comment on ongoing proposals, and vote on important issues, promoting greater participation and transparency in the decision-making processes of the Municipality of Prato.

In the context of citizen involvement in the Municipality of Prato for climate sustainability transition initiatives, it is important to consider both positive and negative feedback that may influence the process. Positive feedback, or synergies, may amplify the effects of actions undertaken, while negative feedback, or undercuts, may hinder their success. Here is how these concepts can be applied:

Positive feedback (synergies):

Active participation: Meaningful citizen involvement can lead to greater awareness and a sense of responsibility towards sustainability, creating a virtuous circle of support and collaboration.

Knowledge sharing: Citizen participation can lead to the sharing of knowledge and experience, providing innovative ideas and creative solutions to environmental challenges.

Legitimation of decisions: Involving citizens in the decision-making process can increase the legitimacy of environmental policies adopted by the Municipality, enhancing their acceptance and adherence by the community.

Empowerment: Active participation of citizens can increase their sense of ownership and empowerment, encouraging them to actively contribute to building a more sustainable city.

Negative feedback (undercuts):

Disparities in participation: Disparities in citizen participation may arise, with some groups being over-represented compared to others. This could lead to decisions that are not representative of the interests of the entire community.

Resistance to change: Some sectors of the community may resist change or sustainability policies, fearing negative consequences on their activities or lifestyle.

Frustration and disillusionment: If involvement initiatives do not produce tangible results or if citizens' opinions are not taken into account.

To address this feedback, it is essential to promote fair and inclusive participation, ensuring transparency, accessibility and accountability in decision-making processes. Furthermore, it is important to continuously monitor the results of engagement initiatives and in the context of monitoring, strategies will be adapted according to the feedback received from the community.

B-1.1: Impact Pathways						
Fields of action		**Systemic levers**	**Early changes (1-2 years)**	**Late outcomes (3-4 years)**	**Direct impacts (Emission reductions in tonCO2eq)**	**Indirect impacts (co-benefits)**
1.Residential Buildings	1.1	Technology/Infrastructure: Complete energy requalification of private buildings (building envelope + installations), with the aim of involving 1,650 apartment blocks by 2030 in the jump of at least two energy classes with complete efficiency upgrades of the building envelope and heating/air conditioning systems. The installation of self-producing energy systems is excluded from the intervention.	450 condominiums upgraded	900 condominiums upgraded	8.166,18	- Improved air quality - Enhanced livability in the home environment - Increased technological readiness & rate of adoption
	1.1 bis	Finance and Funding: The aim is to support those who carry out energy requalification interventions through the economic and tax incentive mechanisms of the Conto Termico and Ecobonus provided by the State. The total estimated financing at national level is about 460,000,000 € by 2030. The Municipality of Prato will encourage this action with measures such as the energy desk, information and awareness campaigns, building regulations, energy planning and bureaucratic simplification. The management costs of the information retrieval measure borne by the Municipality are those related to internal staff and the cost of modifying the data collection platform. The total cost of the action €777.850.000.				
	1.1 ter	Learning & Capabilities: The Municipality of Prato will encourage this action with measures such as the energy desk, information and				

		awareness campaigns, building regulations, energy planning and bureaucratic simplification. These measures will aim to: • facilitate the authorisation process • obliging action to be taken before national obligations or achieving higher performance values than national ones • make known all the possible incentives that can be accessed to finance the type of intervention concerned • raise awareness of change among stakeholders				
	1.2	Technology/Infrastrutture: Boilers are to be replaced with heat pumps, with the aim of involving about 85% of the private buildings not included in the complete energy requalification (a total of 34,855 homes).	5.000 boilers replaced	15.000 boilers replaced	44.194,77	- Improved air quality - Reduced energy demand, needs, or consumption
	1.2bis	Finance and Funding: The aim is to support those who carry out energy requalification interventions through the economic and tax incentive mechanisms of the Conto Termico and Ecobonus provided by the State. The Municipality of Prato will encourage this action with measures such as the energy desk, information and awareness campaigns, building regulations, energy planning and bureaucratic simplification. The management costs of the information retrieval measure borne by the Municipality are those related to internal staff and the cost of modifying the data collection platform.				

		The total cost of the action is €207.000.000.				
	1.2 ter	<u>Learning & Capabilities:</u> The Municipality of Prato will encourage this action with measures such as the energy desk, information and awareness campaigns, building regulations, energy planning and bureaucratic simplification. These measures will aim to: • facilitate the authorisation process • obliging action to be taken before national obligations or achieving higher performance values than national ones • make known all the possible incentives that can be accessed to finance the type of intervention concerned • raise awareness of change among stakeholders				
	1.3	<u>Technology/Infrastructure:</u> Replacement of gas hobs with induction hobs of energy class at least A+ for about 78.000 private households.	10.000 gas hobs replaced	30.000 gas hobs replaced	11.343,88	- Improved air quality - Enhanced livability in the home environment - Increased technological readiness & rate of adoption
	1.3bis	<u>Finance and Funding:</u> The Municipality of Prato will encourage this action with measures such as the energy desk and information and awareness-raising campaigns. The total cost of the action is EUR 56 million.				

	1.3 ter	<u>Learning & Capabilities:</u> The Municipality of Prato will encourage this action with measures such as the energy desk and information and awareness-raising campaigns.				
	1.4	<u>Technology/Infrastructure:</u> Replacement of an obsolete household appliance (chosen from ovens, fridges, dishwashers and washing machines) with a class at least A+ for about 7.800 households (low-income families)	1.000 appliances replaced	3.000 appliances replaced	261,42	- Enhanced livability in the home environment - Increased technological readiness & rate of adoption - Reduced energy demand, needs, or consumption
	1.4bis	<u>Finance and Funding:</u> The Municipality will undertake to find the funds for an annual call for tenders to incentivise the purchase of higher efficiency appliances, which will be repeated until 2030. In addition to the costs for financing the interventions, there will be additional costs for drafting and managing the call for funding. The total cost of the action is 5.4 Mln €.				
	1.4 ter	<u>Learning & Capabilities:</u> These annual calls for tenders provide continuity in assisting households, promoting the use of energy-efficient technology and contributing to the long-term reduction of energy consumption in the Municipality. This action not only aims to have a positive impact on the environment but also to give support to low-income families with a positive effect on the family economy in the long run				

	1.5	<u>Technology/Infrastructure:</u> Replacement of fluorescent lamps with LED lamps for 10% of the approximately 78,000 private households. An average of eight light bulbs per home was considered.	10.000 fluorescent bulbs replaced	27.000 fluorescent bulbs replaced	450,72	- Reduced energy demand, needs, or consumption - Increased technological readiness & rate of adoption
	1.5bis	<u>Finance and Funding:</u> The total cost of the intervention is €374.386				
	1.5 ter	<u>Learning & Capabilities:</u> The Municipality of Prato will encourage this action with measures such as the energy desk and information and awareness-raising campaigns.				
	1.6	<u>Governance & Policy:</u> In the Prato area, a new municipal regulation is to be introduced to establish restrictions on the use of air conditioning systems (heating and cooling) in private buildings, in order to manage energy consumption more effectively.	started	made	10.445,00	- Enhanced livability in the home environment - Increased technological readiness & rate of adoption - Reduced energy demand, needs, or consumption
	1.6bis	<u>Finance and Funding:</u> The Municipality of Prato will encourage this action with measures such as the energy desk and information and awareness-raising campaigns The total cost of the ordinance is €50.000, the Municipality pledges to find the funds for the				

		implementation of the ordinance. In addition, the cost of this action is linked to the cost of internal staff within the administration who will be involved in the drafting of the regulation and verification.				
	1.6 ter	Learning & Capabilities: Finally, special attention will be given to the issue of controls and sanctions, a necessary condition to ensure the operability of the instrument				
	1.7	Technology/Infrastructure It is planned to install photovoltaic panels on the useful surfaces of residential roofs with a total capacity of about 58 MWp and an expected output of 68.776 MWh. In order to achieve the above objectives, it will be important to promote the development of Energy Communities in the Municipality. It should be noted that the Municipality has already committed itself, with Municipal Council Resolution No. 306 of 03/10/2023, to support and promote initiatives that may lead to the development of Renewable Energy Communities with a view to a concrete and effective sustainable development at local level in implementation of Legislative Decree 199/2021 and Tuscan Regional Law 42/2022. The sizing of the installations was based on covering 20% of the residential sector's estimated energy consumption by 2030. This value was	10 MWp installed	27 MWp installed	26.479,00	- Increased access to clean, stable, affordable energy - Reduced energy poverty - Enhanced citizen & communities' participation & social capacities for participation/ engagement

		obtained as the sum of the value of the EIB's electricity consumption in the residential sector and the increases in consumption related to electrification strategies resulting from the complete upgrading intervention, the replacement of boilers with heat pumps and the replacement of cookers with induction hobs. The benefits expected from energy efficiency measures related to the replacement of obsolete household appliances and LED lamps were then subtracted from the total.				
	1.7 bis	Finance and Funding: The Municipality of Prato will encourage this action with indirect measures such as the energy desk, energy annex, energy planning and bureaucratic simplification. The Municipality will also promote the establishment of energy communities in the territory. The total cost of the action is € 145,000,000				
	1.7 ter	Learning & Capabilities: The objective of awareness-raising campaigns is to: • facilitate the authorisation process • obliging action to be taken before national obligations or achieving higher performance values than national ones • make known all the possible incentives that can be accessed to finance the type of intervention concerned				

		• raising awareness among stakeholders for change In order to achieve the above objectives, it will be important to promote the development of Energy Communities in the municipal territory. It should be noted that the Municipality has already committed itself, with Municipal Council Resolution No. 306 of 03/10/2023, to support and promote initiatives that may lead to the development of Renewable Energy Communities with a view to a concrete and effective sustainable development at local level in implementation of Legislative Decree 199/2021 and Tuscan Regional Law 42/2022.				
	1.8	<u>Energy Procurements:</u> Certified green electricity with Guarantees of Origin (GO) is expected to cover 80% of the sector's energy needs by 2030 (estimated as described in Action 1.7). The Municipality is assessing the feasibility of purchasing Guarantees of Origin for electricity used by third parties.	50.000 MWh of purchases from green energy	130.000 MWh of purchases from green energy	105.915,00	- Increased energy efficiency or rate of retrofit (including district heating) - Reduced energy demand, needs, or consumption - Increased access to clean, stable, affordable energy
	1.8 bis	<u>Finance and Funding:</u> The Municipality of Prato will encourage this action with indirect measures such as the energy desk and with programme agreements with some supply companies. The Municipality undertakes, through dialogue with specialized operators, to assess the feasibility of purchasing Guarantees of Origin to cover the electricity used by third parties in order to guarantee the				

		eventual achievement of the 2030 target. The total cost for the purchase of green electricity is €180 million.				
	1.8 ter	<u>Learning & Capabilities:</u> The Municipality will provide for an obligation to purchase certified green electricity for all entities that access incentive programmes for energy efficiency measures or the construction of energy production plants from renewable sources. The Municipality of Prato will also encourage this action with indirect information and awareness-raising measures such as energy desks and communication campaigns. The Municipality undertakes, through dialogue with specialized operators, to assess the feasibility of purchasing Guarantees of Origin to cover the electricity used by third parties in order to guarantee the eventual achievement of the 2030 target.				
2.Industries (excluded ETS)	2.1	<u>Technology/Infrastructure:</u> The installation of photovoltaic panels is planned in the Industrial Macrolotto 1, Macrolot 2 and Artisan Areas. In particular, in Macrolotto 1, the introduction of a photovoltaic energy grid has been planned on canopies strategically positioned above the new industrial building elevations and largely above the new extension volumes built on top of them, by means of 500 Wp panels for a total surface area of 400,062 square meters, 37.4% of the	34 MWp installed	69 MWp installed	49.329,18	- Increased energy efficiency or rate of retrofit (including district heating) - Reduced energy demand, needs, or consumption

		total roofing area. The total installed power is 119,779 kWp				
	2.1-bis	Finance and Funding: The total cost of the action is 238 Mln €, the cost of the photovoltaic installation alone being 2.000 €/kwp				
	2.1 ter	Learning & Capabilities: The Municipality of Prato will also encourage this action with measures such as energy planning and bureaucratic simplification, energy counter and information and awareness campaigns.				
	2.2	Technology/Infrastructure: In addition to the redevelopment measures envisaged in the structural plan in Macrolotto 1, Macrolotto 2 and the Artisan Areas, the Municipality also plans a targeted action in the other industrial areas in the Prato territory, aimed at the installation of photovoltaic modules for production from RES.	3 MWp installed	6 MWp installed	4.620,00	
	2.2 bis	In particular, a two-year call for tenders is assumed until 2030 with a total cost for the installation of RES of € 20 million. The cost of this action is related to the cost of internal administration staff who will be involved in the drafting of the regulation and a higher cost of verification.				
	2.2 ter	Learning & Capabilities: The Municipality of Prato will also promote the implementation of this action with measures such as energy planning and bureaucratic simplification, energy counter				

		and information and awareness campaigns.				
	2.3	<u>Technology/Infrastructure:</u> It is planned to improve the energy consumption of companies in Prato's textile district through energy efficiency measures. In the possible interventions, self-producing energy plants were excluded (as they are accounted for in a specific action). The expected results were estimated on the basis of those achieved by the public financing programme implemented in agreement between the Municipality, the Ministry of Economic Development (now the Ministry of Enterprise and Made in Italy) and the Ministry of Economy and Finance. The programme has financed 38 projects to date, generating investments of €6.880.000 (70% covered by incentives) and reducing CO2 emissions by 5.300 tonnes per year. A two-year renewal of the call is envisaged, with funding for around 300 projects to 2030. The total cost of the action is € 105 million	Around 85 projects funded	Around 170 projects funded	63.002,00	- Increased energy efficiency or rate of retrofit (including district heating) - Reduced energy demand, needs, or consumption
	2.3 bis	<u>Finance and Funding:</u> In 2022, an extraordinary non-repayable grant of € 10 million was allocated to textile companies in the Municipality of Prato, in implementation of the law 'State Budget for the three-year period 2022-2024' of the Ministerial Decree of 5 August 2022, of which 4 million euro for energy efficiency measures.				

		Several two-year calls for tenders are expected to be issued for the financing of energy efficiency measures aimed at reducing electrical and thermal consumption, in addition to the ministerial call already prepared for the Prato textile district (DM 5/8/22). Total funding to 2030 is expected to be around 8 million Euro In addition to the costs for financing the interventions, there will be additional costs for drafting and managing the call for funding.				
	2.3 ter	Learning & Capabilities: The Municipality of Prato will also promote the implementation of this action with measures such as energy desks and information and awareness campaigns. N.B. The benefits accounted for in this sheet do not include the installation of photovoltaic systems. The savings associated with this type of intervention have been accounted for separately in tab 2.2.				
	2.4	Technology/Infrastructure: One of the most popular initiatives to enable organizations to define targets and related mitigation plans in line with the objectives defined in the Paris Agreement is the Science-Based Target Initiatives (SBTI). The initiative, a collaboration between CDP, the United Nations Global Compact, the World Resources Institute (WRI) and the World Wide Fund for Nature (WWF), aims to provide a standardized and	Involvement of companies with a total consumption of at least 50,000 MWh thermal and 25,000 MWh electrical	Involvement of companies with a total consumption of at least 135,000 MWh thermal and 60,000 MWh electrical	38.233,00	- Increased energy efficiency or rate of retrofit (including district heating) - Reduced energy demand, needs, or consumption

		scientifically sound approach to guide companies towards a state of carbon neutrality in a manner consistent with social climate and sustainability goals and within the biophysical limits of the planet. Specifically, the SBTI Net-Zero Standard defines corporate 'net-zero' as a pathway characterized by two phases: 1. Reduce Scope 1, 2 and 3 emissions to zero, or to a residual level consistent with achieving net-zero global emissions, or to a sector-wide level in eligible pathways aligned to 1.5°C; 2. Permanently neutralize any residual emissions upon reaching the target year zero and any greenhouse gas emissions released into the atmosphere thereafter. It is planned to involve a total of energy-intensive companies with a total current electricity consumption of at least 138,000 MWh electrical and a total thermal consumption of 322,000 MWh thermal. Companies that have already carried out thermal and electrical efficiency actions through energy efficiency bonuses described in Action 2.3 were excluded from the sample.				
	2.4-bis	<u>Finance and Funding:</u> The total cost of the action is €64 million				

	2.4 ter	Learning & Capabilities: The Municipality of Prato will also promote the implementation of this action with measures such as energy desks and information and awareness campaigns.				
	2.5	Capacity and capability building: Feasibility studies are planned in order to assess the potential and necessary actions to realize 'Positive Energy District' at consortium level.	started	made		- Increased awareness - Improved access to information and awareness
	2.5 bis	Finance and Funding: Entities eligible for funding will be consortia or clusters of companies in a specific territorial context.				
	2.6	Energy procurement It is planned to purchase certified green electricity with Guarantees of Origin (GO) to cover 80% of the sector's energy needs by 2030 for a total of 157.000 MWh electricity. The Municipality is assessing the feasibility of purchasing Guarantees of Origin for electricity used by third parties.	50,000 MWh of purchases from green energy	100,000 MWh of purchases from green energy	60.663,00	- Improved access to information, awareness & behavior change
	2.6 bis	Finance and Funding: The Municipality of Prato will encourage this action with indirect measures such as energy desk and with programme agreements with some supply companies. The total cost of green energy is € 109 Mln.				

	2.6 ter	<u>Learning & Capabilities:</u> The Municipality of Prato will undertake to: • introduce an obligation to purchase certified green electricity for all entities that will access incentive programmes for energy efficiency measures or the construction of renewable energy production plants. • initiate discussions with specialized operators to assess the feasibility of purchasing Guarantees of Origin to cover electricity used by third parties in order to guarantee the eventual achievement of the 2030 target • stimulate this action with information and awareness-raising measures such as energy desks and communication campaigns				
3.Municipal buildings, equipment/facilities Municipal Public Lighting	3.1	<u>Technology/Infrastructure:</u> Entrusting the management and maintenance service of the thermal power plants of municipal buildings with technological improvement and building and plant energy upgrading. Specific interventions on building automation systems aimed at a punctual management of temperatures inside individual rooms and high monitoring and control capabilities new energy services	1.500 thermal MWh of methane gas saved by 2025	3.000 thermal MWh of methane gas saved by 2027	1.100,00	- Increased energy efficiency or rate of retrofit (including district heating) - Reduced energy demand, needs, or consumption

	3.1 bis	Finance and Funding: New Energy Service (annual fee) € 1.740 million The value of the total investment is € 3.490 million					
	3.1. ter	Learning & Capabilities: The Municipality, for the duration of the contract, pays the ESCo a share of the energy savings generated by the efficiency measures. In this way the ESCo recovers the initial investment.					
	3.2	Technology/Infrastructure: Replacement of old **thermal energy** production systems with more efficient systems in **sports facilities.** In this case, interventions have been planned to improve thermal consumption efficiency by replacing obsolete thermal energy production plants with more efficient systems. In particular, the targets set for 2030 include the replacement of systems used for generating thermal energy in swimming pools, gyms and serving football and rugby pitches. The gradual replacement of systems is assumed in order to favor more efficient systems, functional for different uses, aiming at electrification (e.g. replacement of boilers with heat pumps).	about -35% on the assumed annual consumption of heat and electricity	approximately -70% on the assumed annual consumption of heat and electricity	225,00	- Increased energy efficiency or rate of retrofit (including district heating) - Reduced energy demand, needs, or consumption
	3.2bis	Finance and Funding The total cost of the intervention is € 2 million				
	3.2 ter	Learning & Capabilities: The Municipality will undertake to look for contributions at both regional/national and European level or It may choose to finance interventions directly.				

	3.3	Technology/Infrastructure: The action, envisaged in the plan, in particular, involves the gradual re-lamping of the lighting systems of outdoor sports grounds with the introduction of dimming or brightness gradation systems				
	3.3 bis	Finance and Funding A total cost of € 900.000 is envisaged				
	3.3 ter	Learning & Capabilities: The Municipality will undertake to look for contributions at both regional/national and European level or It may choose to finance interventions directly.				
	3.4	Technology/Infrastructure: Re-lamping of the lighting systems in the sports halls, gyms and swimming pools, as well as indoor venues has been planned. The interventions include the replacement of old lamps and ceilings with new high-efficiency LED technology light sources that ensure adequate performance and energy savings.	- approximately 25% of the assumed annual electricity consumption	approximately -45% on assumed annual electricity consumption	2.310,39	- Increased energy efficiency or rate of retrofit (including district heating) - Reduced energy demand, needs, or consumption
	3.4 bis	Finance and Funding: The total cost of the intervention is €500.000				
	3.4 ter	Learning & Capabilities: The Municipality will undertake to look for contributions at both regional/national and European level or It may choose to finance interventions directly.				
	3.5.1	Technology/Infrastructure: Energy requalification of public buildings: Palazzo Benassai and Municipal Palace. In detail, for the above-mentioned buildings, It is	- approximately -25% on assumed annual	approximately 45% of the assumed annual electricity consumption	31,76	- Increased energy efficiency or rate of retrofit

		planned to completely replace the existing lighting systems by 2026 with new high-efficiency LED technology light sources that ensure adequate performance and energy savings	electricity consumption			(including district heating) - Reduced energy demand, needs, or consumption
	3.5.1 bis	Finance and Funding: The total cost of the intervention is € 200.000				
	3.5.1 ter	Learning & Capabilities: The project is in the approval phase and It is expected to be fully implemented by 2024				
	3.5.2	Technology/Infrastructure: The energy upgrading of ordinary lighting systems serving other public buildings is planned. In particular, a plan has been prepared for the gradual replacement of the current lighting fixtures with LED fixtures for the following buildings: • Municipal Offices in via Vittorio Veneto, 9 • Technical Office in via Arcivescovo Martini 60 • Civil Protection in via Lazzerini, 58 • Kindergartens • Primary schools • Middle schools • High School in via F. Baldanzi • Teaching Direction of the 2nd Circle in via Ridolfo del Ghirlandaio • Offices Grignano - Cafaggio and in the Directorate of Education in Via Montalese 247 • Neighborhoods (North, Centre, East, West-Ex Elementary) • Tavola gym in via G. Braga, 24	850 MWh electricity saved	1,730 MWh of electricity saved	1.177,00	- Increased energy efficiency or rate of retrofit (including district heating) - Reduced energy demand, needs, or consumption

		• IPAB Multiethnic Centre in via Roma • Le Badie Multifunctional Centre in via Righi • Ventrone Civic Centre in via Gardenie				
	3.5.2 bis	<u>Finance and Funding:</u> The total cost of the intervention is € 4 million				
	3.5.2 ter	<u>Learning & Capabilities:</u> The Municipality will undertake to look for contributions at both regional/national and European level or It may choose to finance interventions directly.				
	3.6.1	<u>Technology/Infrastructure:</u> **1st Intervention Block:** Within the reduction plan, specific strategies were also included for Public Residential Housing (ERP). Specifically, between **2014 and 2020,** a total of **498** pre-existing **boilers** were removed and replaced with condensing models as part of an energy improvement programme. An analysis of the impact of these replacements, defined only over the two-year period 2019-2020, shows a significant reduction in consumption. In addition, specific work was carried out at three buildings located at <u>Via del Girasole 26/1-2-3</u>, consisting of 18 dwellings subject to ERP regulations. These involved the dismantling and subsequent replacement of single-glazed wooden window frames with new PVC frames with high energy performance, characterized by a minimum thermal transmittance coefficient (Uw) of 1.29 W/sqmK, with	72 boilers replaced, interventions carried out	Interventions already implemented	Included inside residential buildings	- Increased energy efficiency or rate of retrofit (including district heating) - Reduced energy demand, needs, or consumption

		additional masonry work for proper installation. Similar work was carried out in three other buildings located in Via del Malfante 54, 56 and 71, involving 20 dwellings subject to ERP regulations. Here, the single-glazed wooden window frames were replaced with new energy-efficient white PVC frames, accompanied by minor masonry work for a suitable location. The savings of this action were accounted for within the residential buildings.				
	3.6.1-bis	Finance and Funding: The total cost of the interventions financed by municipal funds is €125.000				
	3.6.1 ter	Learning & Capabilities: The Municipality will undertake to look for contributions at both regional/national and European level or It may choose to finance interventions directly.				
	3.6.2	**2° Blocco di Interventi:**. Also in the context of ERP buildings, further future efficiency actions are planned at the buildings located at via del Girasole 26/1-2-3 and via del Malfante 71, through an energy requalification programme between **2022 and 2026**. In addition, during the period 2022-2026, significant interventions have been planned on two buildings located at Via Rubieri 49-55 and Via Zipoli 23/29, involving a total of 48 dwellings subject to ERP regulations. These interventions include roof insulation, replacement of windows and doors, introduction of new shutters, installation of	Started	Made	Included inside residential buildings	- Increased energy efficiency or rate of retrofit (including district heating) - Reduced energy demand, needs, or consumption

		thermoregulation systems, replacement of condensing boilers and seismic improvement works. At the same time, in the context of the 110% Superbonus programme, energy efficiency measures were started on two buildings located at via Capitini 1-13 and via Parini 16-18, involving 54 and 24 dwellings respectively, some of which are subject to ERP regulations. The interventions consist in the construction of thermal insulation, replacement of window frames, introduction of new shutters and installation of new condensing boilers. The savings of this action were accounted for within the residential buildings.				
	3.6.2-bis	Finance and Funding: The total cost of the intervention is € 4.5 million				
	3.6.2 ter	Learning & Capabilities: The Municipality will undertake to look for contributions at both regional/national and European level or It may choose to finance interventions directly.				
	3.7	Technology/Infrastructure: It is planned to install photovoltaic panels with a total capacity of about 3 MWp, of which about 1,990 kWp at a depleted landfill site. The reduction of emissions is limited to the share necessary to meet the needs of the municipal sector.	0.5 MWp installed	1 MWp installed	1.386,00	- Increased access to clean, stable, affordable energy - Reduced energy poverty

	3.7 bis	Finance and Funding: The Municipality will undertake to find the funds to finance the interventions directly, also thanks to contributions obtained at national or European level. The Municipality will also promote the establishment of energy communities in the area. The total cost of the intervention € 8 million				
	3.7 ter	Learning & Capabilities:. The Municipality will endeavor to find the funds to finance the interventions directly, also thanks to contributions obtained at national or European level.				
	3.8	Energy Procurements: A contractual change is planned with the addition of specific criteria for electricity purchases, in order to reach the target of 100% green energy purchases with Guarantees of Origin (GO) to cover 80% of the sector's energy needs.	7.400 MWh of green energy purchases	Made	2.839,00	- Increased access to clean, stable, affordable energy - Reduced energy poverty
	3.8 bis	Finance and Funding: The Municipality of Prato will incentivise this action with a marginal increase in the energy bill to date. The electricity used for street lighting is not certified green because the concession contract with a performance guarantee concluded with an ESCo at the time of signing did not provide for this service. The total cost for the purchase of green energy is €13 million.				

	3.8 ter	<u>Learning & Capabilities:</u> The Municipality will enter into negotiations with the ESCo to supplement the contract and immediately provide for the purchase of certified green electricity for all public lighting utilities.				
4.Tertiary (non-municipal) buildings, equipment/facilities	4.1	<u>Technology/Infrastrutture:</u> It is planned to replace boilers with heat pumps, with the aim of involving energy-intensive activities responsible for about 50% of the thermal consumption for heating in the tertiary sector. For the calculation, 80% of the thermal consumption for heating was considered, with an expected saving of 18.828 MWh.	Replacement of boilers in activities responsible for a total of at least 2,500 MWh of heat	Replacement of boilers of activities responsible for a total of at least 7,200 thermal MWh	3.803,48	- Increased energy efficiency or rate of retrofit (including district heating) - Reduced energy demand, needs, or consumption
	4.1bis	<u>Finance and Funding:</u> The aim is to support those who replace boilers with heat pumps with the economic and tax incentive mechanisms of the Conto Termico and Ecobonus provided by the state. The total cost of the intervention is € 225 million The management costs of the information retrieval measure borne by the Municipality are those related to internal staff and the cost of modifying the data collection platform.				
	4.1 ter	<u>Learning & Capabilities:</u> The Municipality of Prato will encourage this action with indirect measures such as the energy desk, energy annex, energy planning and bureaucratic simplification.				

	4.2	<u>Governance & Policy:</u> Introduction of a municipal ordinance aimed at the optimal management of air-conditioning systems in tertiary activities with obligations to switch on the system in terms of set points (maximum threshold for heating 19°C with a tolerance of 2°C) and operating schedules of 15 days as regards the switch-on period (postponing the start date by 8 days and bringing forward the end date by 7 days) and of 1 hour as regards the daily duration of switch-on. As far as cooling is concerned, the regulation stipulates a minimum temperature set point of 28 °C. According to ENEA good practices, an increase of the thermostat set point from 26 to 28 °C could result in energy savings of approximately 25 per cent on the electricity used for cooling.	Made	Made	836,00	- Improved air quality - Enhanced livability in the home environment ù - Increased technological readiness & rate of adoption - Reduced energy demand, needs, or consumption
	4.2 bis	<u>Finance and Funding:</u>. The total cost of the ordinance is €50.000, the Municipality undertakes to find the funds.				
	4.2 ter	<u>Learning & Capabilities:</u> The Municipality of Prato will also encourage this action with measures such as energy counters and information and awareness campaigns.				

	4.3	Technology/Infrastructure: It is planned to install photovoltaic panels on the useful roof areas of tertiary activities with a total capacity of about 57 MWp and an expected output of about 68.360 MWh of electricity The sizing of the installations was based on covering 20% of the tertiary sector's estimated energy consumption by 2030. This value was obtained from the electricity consumption of the tertiary sector EIB net of the benefits expected from energy efficiency measures and the increase in consumption resulting from the installation of heat pumps.	10 MWp of photovoltaics installed	25 MWp of installed photovoltaics	26.232,60	- Improved air quality - Increased access to clean, stable, affordable energy - Reduced energy poverty - Enhanced citizen & communities' participation & social capacities for participation/ engagement - Improved access to information, awareness & behavior change
	4.3bis	Finance and Funding: The total cost of the action is given by the unit cost of the photovoltaic installation of € 115 million.				
	4.3 ter	Learning & Capabilities: The Municipality of Prato will also encourage this action with measures such as energy counters and information and awareness campaigns. The Municipality will also promote the establishment of energy communities in the area.				
	4.4	Energy Procurements: It is planned to purchase certified green electricity with Guarantees of Origin (GO) to cover 80% of the sector's energy needs by 2030 for a total of 273.422 MWh of electricity.	40.000 electrical MWh of green energy purchased	110.000 electrical MWh of green energy purchased	104.929,00	- Increased access to clean, stable, affordable energy - Reduced energy poverty

	4.4bis	Finance and Funding: The total cost of the intervention is € 130 million				
	4.4 ter	Learning & Capabilities: The Municipality of Prato will also encourage this action with measures such as energy counters and information and awareness campaigns.				
5.Agriculture, Fisheries and Forestry	5.1	Technology/Infrastrutture: It is expected that out of the total number of farms with at least one diesel tractor, 60% will have replaced their tractors with biodiesel technology by 2030, reducing consumption by 5.691 MWh thermal.	around 90 tractors replaced	around 120 tractors replaced	1.519,7	- Increased energy efficiency or rate of retrofit (including district heating) - Reduced energy demand, needs, or consumption - Improved access to information, - - -awareness & behavior change - Enhanced citizen & communities' participation & social capacities for participation/ engagement
	5.1bis	Finance and Funding Incentives for the purchase of more efficient agricultural machinery (e.g. National Institute for Insurance against Accidents at Work national call for tender for agriculture: 50% non-repayable fund for the purchase of agricultural tractors with a ceiling of 42 million allocated in 2023) The total cost of the intervention is € 12 Mln				
	5.1 ter	Learning & Capabilities: The action will be promoted through indirect measures by the Municipality, both through activities carried out by the energy desk in favor of local agricultural entrepreneurs, and through the dissemination of information on existing calls for tenders in the agricultural sector and with specific support activities for joining them. The Municipality will take steps to make the supply of biofuel easier.				

	5.2	Technology/Infrastrutture: It is planned to modernize agricultural machinery and the vehicle fleet with conversion of obsolete vehicles to more efficient ones (excluding tractors considered in action 5.1), of farms responsible for a total thermal consumption of at least 3,000 MWh thermal	farms responsible for a total heat consumption of at least 500 MWh thermal	farms responsible for a total heat consumption of at least 1,250 MWh thermal	759,9	- Improved access to information, awareness & behavior change - Enhanced citizen & communities' participation & social capacities for participation/ engagement
	5.2bis	Finance and Funding: Incentives for the purchase of more efficient agricultural machinery (e.g. National Institute for Insurance against Accidents at Work national call for tender for agriculture: 50% non-repayable fund for the purchase of agricultural tractors with a ceiling of 42 million allocated in 2023). The total cost of the action is €2.3 million				
	5.2 ter	Learning & Capabilities: The action will be promoted through indirect measures by the Municipality, both through activities carried out by the energy desk in favor of local agricultural entrepreneurs, and through the dissemination of information on existing calls for tenders in the agricultural sphere, including on Agriculture 5.0, and with specific support activities for joining them.				
	5.3	Technology/Infrastructure: The specific intervention involves the installation of 350W agri-voltaic modules for a total of about 190 MWp. This power would use about 7% of the agricultural area of the Prato territory. On the basis of a study of the actual potential of the Prato area, the installation of agri-voltaic modules was planned considering only	55 MWp of installed agri-voltage	110 MWp of installed agri-voltage	85.810,95	- Increased access to clean, stable, affordable energy - Reduced energy poverty - Enhanced citizen & communities

		agricultural areas related to permanent crops, permanent meadows and pastures, and excluding arable land (because it consists mainly of cereals and wheat) When dimensioning, good industry practice suggests adopting a maximum LAOR of 40 %. In our case, as a precaution, we considered a LAOR of 30 %, estimating the power density with the following formula: *[MW/ha] = 0.6 (LAOR 30%, modules 350 W).* Plant sizing was based on covering 20% of the agricultural sector's estimated energy consumption by 2030. This value was obtained from the EIB's electricity consumption in the agricultural sector.The reduction in emissions refers only to the share needed to cover the needs of the agricultural sector.				, participation & social capacities for participation/ engagement
	5.3bis	<u>Finance and Funding:</u> Incentives under the National Recovery and Resilience Plan's Agrivoltaic call for proposals. The total cost of the intervention is € 380 million				
	5.3 ter	<u>Learning & Capabilities:</u> In addition to national incentives for such interventions, the Municipality of Prato will encourage this action with measures such as the energy desk, information and awareness campaigns, energy planning and bureaucratic simplification. These measures will aim to:				

		• facilitate the authorisation process • make known all the possible incentives that can be accessed to finance the type of intervention concerned • raising awareness among stakeholders for change In order to achieve the above objectives, it will also be important to promote the development of energy communities in the Municipality. It should be noted that the Municipality has already committed itself, with Municipal Council Resolution No. 306 of 03/10/2023, to support and promote initiatives that may lead to the development of Renewable Energy Communities with a view to a concrete and effective sustainable development at local level in implementation of Legislative Decree 199/2021 and Tuscan Regional Law 42/2022.				
	5.4	Energy Procurements: Certified green electricity with Guarantees of Origin (GO) is planned to cover 80% of the sector's energy needs by 2030 for a total of 2,765.77 MWh	500 MWh electricity purchases of green energy	1.250 MWh electricity purchases of green energy	1.064,76	- Increased access to clean, stable, affordable energy - Reduced energy poverty - Enhanced citizen & communities' participation & social capacities for participation/ engagement
	5.4bis	Finance and Funding: The Municipality of Prato will encourage this action with indirect measures such as the energy desk and with programme agreements with some supply companies. The total cost of the intervention is €.1.8 million				
	5.4 ter	Learning & Capabilities: The Municipality undertakes, through dialogue with				

		specialized operators, to assess the feasibility of purchasing Guarantees of Origin to cover the electricity used by third parties in order to guarantee the eventual achievement of the 2030 target.				
6.Transport	6.1	Technology/Infrastructure: One of the most important strategies envisaged to reduce the use of private vehicles within the Municipality of Prato is based on the strengthening of the Local Public Transport system, in order to increase Local Public Transport use from the current 6% to 50% by 2030. To achieve this target, a number of specific actions have been identified: ● build the first urban tramway line central station - Pecci museum, capable of transporting at least 2.000 passengers per hour per direction increase the frequency from 3 to 6 passages per hour on average on the Local Public Transport network ; ● increase the number of buses from 60 to 90 at peak hours, with only electric or hydrogen-powered vehicles; ● make access to the service free of charge for all users, at least for a period of time.	18.2% of daily travel by Local Public Transport (91,000 daily trips)	31.0% of daily travel by LPT (154,000 daily trips)	68.750,00	- Improved air quality - Reduced noise pollution - Increased road safety - Increased modal shift to public transit, walking, cycling - Decreased modal share of private vehicles - Increased uptake of low-carbon technology vehicles for private, freight, public transport (EVs, e-bikes, hydrogen-fuelled etc.)
	6.1 bis	Finance and Funding: The Municipality of Prato undertakes to draw up a feasibility study and obtain the necessary resources to optimize the Local Public Transport by				

		initiating talks with the Region and Ministries. Investment costs amounted to € 245 million Operating costs amounted to € 45 million € per year.				
	6.1 ter	Learning & Capabilities: The Municipality of Prato undertakes to carry out awareness campaigns to encourage an increase in the use of public transport.				
	6.2	Technology/Infrastructure The objective of the action is therefore to strengthen the main road network in order to limit the improper use of the local road network by reducing, within the latter, the so-called 'through traffic', i.e. that component that has crossed the dense city to reach a destination outside it. In quantitative terms, the purpose is to reduce local traffic using private vehicles with internal combustion engines (car/motorbike/van), with the goal of reducing its use from the current 82% to 26% by 2030. By improving the practicability of the main road system, access to the interchange car parks for the car-Local Public Transport modal exchange is also favored. These car parks, in fact, as provided for by the recently adopted Structural Plan, are located right on the main road system and connected to the public transport system.	- Reduction of 16% of trips by private vehicles with internal combustion engines (compared to the baseline of 447,273 daily trips). - Shift 14% of daily trips by private internal combustion vehicle from local to main roads.	- Reduction of 31% in private vehicle journeys by internal combustion engine compared to the baseline of 447,273 daily trips. - Shift of 27% of daily trips by private internal combustion vehicle from local to main roads.	11.931,82	
	6.2 bis	Finance and Funding: The Municipality will take steps to find funding of approximately € 105.000.000 for the following measures: • strait s.lucia: €1.000.000				

		• adaptation of viale Cervi: €5.000.000 • L.Rossi street subway: € 7.000.000 • Borgonuovo connection: €8.000.000 • Capezzana overpass: € 10.000.000 • adaptation of industrial axis: €20.000.000 • completion of industry axis connections: €15.000.000 • completion of Via della Pace: € 10.000.000 • completion of second ring road: €15.000.000				
	6.2 ter	Learning & Capabilities: The Municipality of Prato undertakes to draw up a feasibility study and obtain the necessary resources to upgrade the road infrastructure by initiating talks with the region and ministries.				
	6.3	Technology/Infrastructure In order to reduce the use of private cars with internal combustion engines, the Municipality plans to act on school transport, with the following measures: • Strengthen the pedibus service, to increase from 500 to 5.0000 trips per day; • Expand urban school transport from 1.600 to 5.000 trips per day.	2.800 daily trips by pedibus and urban school transport	5.600 daily trips by pedibus and urban school transport	1.875,00	
	6.3bis	Finance and Funding: The investment costs for the pedibus €200.000				

		The running costs of the pedibus are € 100.000 The investment costs of urban school transport €4 million The operating costs of urban school transport amount to € 1.25 million				
	6.3 ter	Learning & Capabilities: The Municipality will adapt the signage to make the service safer and will provide suitable staff to manage it.				
	6.4	Technology/Infrastructure Aiming to reduce the use of private cars with internal combustion engines, the Municipality plans to introduce carpooling, car and bike sharing and electric scooters with the goal of reaching 5.000 trips per day by 2030.	1.400 daily trips through carpooling and car sharing services	2.800 daily trips via carpooling and car sharing services	937,50	
	6.4 bis	Finance and Funding: The Municipality will allocate funds, approximately € 2.000.000, for the implementation of intervention 6.4.				
	6.4 ter	Learning & Capabilities: The Municipality will enter into agreements with car sharing and bike sharing companies to implement the service in the area and may encourage the use of carpooling apps. In addition, the Municipality will provide benefits for companies that adopt carpooling, such as free permits to circulate in the Limit Traffic Zone.				
	6.5	Technology/Infrastructure As a further action aimed at reducing the use of private cars with internal combustion engines, the Municipality plans to upgrade the Florence-Prato	- 2.800 Daily travel by rail on the Florence-Prato line	- 5.600 Daily travel by rail on the Florence-Prato line - 80.000	20.531,00	

		and Valbisenzio railway line with the objective of reaching 10.000 journeys per day	- 40.000 Daily (extra) journeys by Valbisenzio rail transport	Daily (extra) journeys by Valbisenzio rail transport		
	6.5 bis	Finance and Funding: The cost for the Florence-Prato rail transport investment is estimated at €12 million and the cost for operating the service at €5 million per year. In terms of investment costs for rail transport Valbisenzio €16 million.				
	6.5 ter	Learning & Capabilities: The Municipality, in agreement with the Region and the Municipality of Florence and Ferrovie dello Stato, will undertake to find the necessary resources, also by activating national and European contributions, to upgrade the necessary infrastructure.				
	6.6	Technology/Infrastructure A series of actions focused on out-of-town transport are planned. In particular, one of the planned actions aims at reducing the number of daily trips by private internal combustion vehicles through the expansion of extra-urban public road transport services, with the goal of achieving a 20% increase in use by 2030 (compared to current values). The other action, on the other hand, focuses on out-of-town school transport and also targets an expansion of the current service with a target of a 20% increase in use by 2030.	885.000 Daily extra-urban travel	169.000 Daily extra-urban travel	23.375,00	

	6.6 bis	Finance and Funding: With regard to investment costs for out-of-town non-school transport, the cost of purchasing vehicles is estimated at €6 million and the cost of operating the service at €2.64 million per year. With regard to investment costs for out-of-town school transport, the cost of purchasing the vehicles is estimated at €1.5 million and the cost of operating the service at €1.25 million per year.				
	6.6 ter	Learning & Capabilities: From this point of view, the Municipality of Prato undertakes to revise the agreement with Autolinee Toscane providing for additional resources, which will be recovered through internal funds and national or European contributions, in order to optimize the service with respect to the set objective. This agreement may provide for the commissioning of new buses, an increase in frequency, and possible concessions on season tickets, especially for students.				
	6.7	Technology/Infrastructure In terms of logistics-related transport, the 'Last Mile' initiative is an important intervention included in the action plan for reducing emissions. Through this initiative, in the area of retail delivery of goods (business supply), the purpose is to limit the access of vehicles used for goods transport into the city center, thus avoiding approximately 84.000 daily trips by 2030 with internal combustion vehicles.	29% reduction in logistical trips (from 84,000 trips in 2023 to 60,000 remaining trips)	57% reduction in logistics trips (from 84,000 trips in 2023 to 47,700 remaining trips)	26.250,00	- Improved air quality - Reduced noise pollution

		In this context, the 'swap body' initiative envisages a series of strategies and actions to improve the efficiency and effectiveness of the delivery of goods from the logistics hub to the final consignee. A joint action is planned to introduce an obligation to use electric vehicles for logistics and a rational and sustainable management of logistics through the City Gate project.				
	6.7 bis	Finance and Funding: Furthermore, in order to reduce the inconvenience, the Municipality in agreement with external parties, such as the Interporto, will be able to guarantee a service for the optimisation of goods and the recharging of vehicles that will be obliged to enter the city. It is estimated to cost around €3.000.000 to start up and run the service. The Municipality is committed to finding the necessary resources by initiating talks both with private entities and with the Region and Ministry. In addition, the Municipality will undertake to promote and to raise citizens' awareness on sustainable mobility issues through the energy desk and various events in the area, and to implement infrastructural interventions in the Prato area based on the widespread distribution of electric recharging points (detailed intervention in the next section).				

	6.7 ter	Learning & Capabilities: To optimize logistics management, the Municipality will involve the Interporto of Prato, identified as the main logistics hub for the Prato district, financing the various interventions either with its own funds or with contributions from supra-municipal bodies.				
	6.8	Technology/Infrastructure: Target al 2030 fissato a 16.125 spostamenti extraurbani equivalenti a circa 4 mila auto elettriche. L'incremento di fabbisogno di elettricità per veicoli elettrici stimato è di circa 19.486 MWh. In line with the European regulation that prescribes a stop to endothermic engines for new cars and vans from 2035, the Municipality of Prato plans to replace combustion vehicles with electric vehicles. In detail, the action envisages the replacement of 50% of local daily trips by electric vehicles assessed as residual after all the actions planned with reference to the strengthening of the Local Public Transport and improvement of urban roads. Target 2030 set 140.228 trips equivalent to approximately 38.000 electric vehicles. It is also planned to replace 25% of daily out-of-town trips made by private cars, assessed as the residue of actions to strengthen out-of-town transport services. Target to 2030 is 16.125 extra-urban trips equivalent to about 4,000 electric cars. The estimated increase in electricity requirements for	- 40.000 Local travel by electric car Corresponding to approximately 1,000 electric vehicles - 4.600 Suburban travel by electric vehicles Corresponding to approximately 500 electric vehicles	- 80.000 Local travel by electric car Corresponding to approximately 10,000 electric vehicles - 9.200 Suburban travel by electric vehicles Corresponding to approximately 1,500 Electric vehicles	28.987,92	- Increased modal shift to public transit, walking, cycling - Decreased modal share of private vehicles - Increased uptake of low-carbon technology vehicles for private, freight, public transport (EVs, e-bikes, hydrogen-fuelled etc.)

		electric vehicles is approximately 19,486 MWh				
	6.8 bis	Finance and Funding: The Municipality will undertake to promote and raise citizens' awareness on sustainable mobility issues through the energy desk and various events in the area, and to carry out infrastructural interventions in the Prato area based on the widespread distribution of electric recharging points. The total cost of replacing electric cars is €1 million.				
	6.8 ter	Learning & Capabilities: The Municipality will undertake to promote and raise citizens' awareness on sustainable mobility issues through the energy desk and various events in the area, and to implement infrastructural interventions in the Prato area based on the widespread distribution of electric recharging points (detailed intervention in the next section).				
	6.9	Technology/Infrastructure: It is planned to install around 4.000 electric charging stations to cover the needs related to the modernisation of buses and the replacement of private combustion cars with electric cars.	500 electric charging stations installed	1.500 electric charging stations installed	-	- Increased uptake of low-carbon technology vehicles for private, freight, public transport (EVs, e-bikes, hydrogen-fuelled etc.)
	6.9 bis	Finance and Funding: The total cost of the installation is € 132 million				

	6.10	Technology/Infrastructure In the context of the electrification strategy for internal combustion vehicles remaining until 2030, a specific action on the municipal car fleet has also been planned. The action envisages a gradual replacement of internal combustion vehicles, in order to achieve total conversion of the entire fleet to electric by 2030.	15% replacement of municipal fleet	40% replacement of municipal fleet	118,00	- Increased uptake of low-carbon technology vehicles for private, freight, public transport (EVs, e-bikes, hydrogen-fuelled etc.)
	6.10 bis	Finance and Funding: The costs of the intervention will be borne either by internal municipal resources or by taking advantage of supra-municipal incentives. The total cost of the intervention is € 5 million.				

	6.11	Technology/Infrastructure Increasing soft mobility by expanding and improving the city's cycle network in accordance with the municipal cycle plan and providing incentives for the purchase of bicycles. In addition, it is envisaged that services to cycle mobility will be realized through the construction of: • A velostation near the Prato Centrale station as part of the reorganization of the integrated public and private mobility hub; • An equipped and safe bicycle parking area at the Prato Borgonuovo station to ensure rail-bike integration within the closest station and service to the new hospital in Prato. The intervention integrates and completes the bicycle connection between the hospital and the railway station. • Installation of racks at urban mobility hubs (schools, social and health services, shopping, leisure and sports facilities, etc.)	2.000 bicycles financed	6.000 bicycles financed	5.245	- Increased modal shift to public transit, walking, cycling - Decreased modal share of private vehicles - Increased uptake of low-carbon technology vehicles for private, freight, public transport (EVs, e-bikes, hydrogen-fuelled etc.)
	6.11bis	Finance and Funding: The Municipality will undertake to promote the purchase of bicycles through communication and awareness-raising, collaborating with national initiatives such as the bicycle bonus, considering offering a subsidy of up to Euro 800 per bicycle for up to 10.000 bicycles.				

	6.11 ter	Learning & Capabilities: Furthermore, through the energy desk and various events in the area, the Municipality will promote and raise awareness of sustainable mobility issues among citizens.				
	6.12	Technology/Infrastructure. With regard to local public transport, the Urban Sustainable Mobility Plan scenario proposes interventions of particular relevance to the transport offer aimed at integrating the urban and extra-urban dimensions of public mobility services and networks. The proposed intervention envisages the use of part (about 20 thousand m^2) of the areas no longer used by the freight yard located near the main station as a hub. The presence of the Interporto and the interconnection with the railway line have led to a clear weakening of the functions of the Prato central railway yard, leaving a substantial part of areas adjacent to the consolidated city unused, with obvious effects of abandonment and degradation.	Started	Made		

	6.12 bis	Costs have not been estimated				
	6.13	Technology/Infrastructure With regard to self-production from RES related to the mobility sector, a detailed analysis was conducted based on the evaluation of the actual potential of the Prato territory. The analysis showed an actual potential for the installation of photovoltaic systems on the suitable surfaces of mobility-related facilities, in particular car parks and stations, in order to achieve a total capacity of about 6 MWp and an estimated producibility of about 3.600 MWh per year.	2 MWp	4 MWp	2.772,00	- Increased access to clean, stable, affordable energy - Reduced energy poverty - Enhanced citizen & communities' participation & social capacities for participation/ engagement
	6.13 bis	Finance and Funding: The total cost of the intervention is € 15 million				
	6.14	Energy Procurements: By 2030, it is planned to purchase certified green electricity with Guarantees of Origin (GO) to cover 80% of the mobility sector's energy needs by 2030 (estimated as described in Action 6.15), totalling 55,260 MWh. The Municipality is assessing the feasibility of purchasing	55,000 MWh of green energy purchased	19.000 MWh of green energy purchased	21.275,10	

		Guarantees of Origin for electricity used by third parties.				
	6.14 bis	Finance and Funding: The Municipality of Prato will incentivise this action with indirect measures such as programme agreements with the companies managing the electric charging service. The concession will include an obligation on the part of the concessionaire to supply customers only with green energy. The total cost of purchasing electricity is €28 million.				
7. Waste	*7.1*	7.1 Technology/Infrastructure Based on the information gathered by the two groups, photovoltaic panels with a total capacity of around 1.5 MWp are expected to be installed by 2030, with an expected output of around 1,800 MWh. In the short term, two photovoltaic plants will be built by Alia S.p.A. on the Textile Hub plant (a new plant for the recovery of textile fractions located in the Municipality of Prato in Via di Baciacavallo) and on the roofs of the new TM Paronese plant in Via Paronese 110. The expected production of these plants will be about 750,000 kWh.	0.5 MWp installed	1 MWp installed	693,00	- Increased access to clean, stable, affordable energy - Reduced energy poverty - Enhanced citizen & communities' participation & social capacities for participation/engagement - Increased access to clean, stable, affordable energy - Reduced energy poverty - Enhanced citizen & communities
	7.1 bis	Finance and Funding: The Municipality of Prato will encourage the implementation of these actions by talking with the two companies in order to sign a series of agreements to maximize the installable photovoltaic power.				

		The total cost of the actions is € 3.7 million.				' participation & social capacities for participation/ engagement
	7.2	<u>Energy Procurements:</u> Certified green electricity with Guarantees of Origin (GO) is expected to meet all energy consumption in the waste sector by 2030. This would mean a commitment by the two companies Alia S.p.A. and G.I.D.A. to purchase certified green energy. In order to encourage the implementation of this action, the Municipality of Prato will realize agreements with the two investee companies. The agreements will have to provide for the use of certified green energy for all the facilities and installations managed by the two companies in the Prato territory and the reporting to the Municipality of the green electricity used.	8.000 MWh of green energy purchased	16.000 MWh of green energy purchased	12.281,50	- Reduced energy poverty - Enhanced citizen & communities' participation & social capacities for participation/ engagement
	7.2 bis	<u>Finance and Funding:</u> In order to encourage the implementation of this action, the Municipality of Prato will realize agreements with the two investee companies. The agreements will have to provide for the use of certified green energy for all the facilities and installations managed by the two companies in the Prato territory and the reporting to the Municipality of the green electricity used. The total cost for the purchase of green electricity is € 18 million				

Transversal Actions		Governance & Policy: **Awareness-raising campaigns** Awareness-raising campaigns take the form of strategies aimed at stimulating citizens' interest and providing background information on relevant issues, playing a crucial role in positive community readiness and facilitating the implementation of reduction actions. Although the effects of such initiatives are often difficult to quantify directly, their impact lies in creating awareness and establishing a social climate conducive to collaboration and change, particularly towards a sustainability paradigm. In particular, in the context of the plan to reduce emissions by 2030, it is planned to design a series of campaigns, realizing events and webinars, aimed at raising awareness among the various stakeholders on the actions to be taken to reach the target. By promoting sustainable practices and providing information on technologies and facilities, these initiatives aim to achieve sustainability targets. Below is an outline of what could be the topics for the sectors: - Residential Buildings: Raising awareness on energy efficiency strategies for private buildings, such as replacing obsolete boilers with heat pumps, replacing low-efficiency household appliances and promoting a more sustainable lifestyle. In particular, the Municipality of Prato's 'Sustainable Condominiums' project aims to promote the	Started	Started	n.a.	

		energy requalification of condominium buildings by providing technical advice and information on available incentives. Through public meetings and the collection of applications, participating buildings will be selected. Subsequently, an energy diagnosis will be carried out to identify efficient interventions. Proposed interventions will be presented to apartment blocks, which can then decide to proceed with implementation. Qualified suppliers will be selected to implement the interventions, and the project will provide supervision during implementation to ensure that the standards and energy savings are met. -Industry: Awareness-raising on emissions reduction and sustainability reporting initiatives (such as Science-Based Target Initiative (SBTi), Sustainability Reporting, etc.) and publicizing calls for tenders that incentivise energy efficiency and renewable energy production. - Tertiary sector: Awareness-raising on good practices to contain energy consumption and on the implementation of advanced technological solutions to make commercial spaces more energy efficient. -Agriculture: Awareness-raising on replacement and modernisation of machinery and tractors, adopting more energy-efficient technologies and reducing environmental impact (e.g. Agriculture 4.0, agri-voltaics, etc.). - Sustainable Mobility: Promotion of the use of electric vehicles, public transport and				

		soft mobility initiatives such as the pedibus. For these initiatives, the Municipality intends to organize events on the territory in collaboration with the Italian Environmental and Bicycle Federation, an environmental organization committed to the diffusion of the bicycle as a means of daily and leisure transport, with the aim of promoting practices that favor the diffusion of soft mobility, illustrating available solutions and incentives. With regard to awareness, it is important to emphasize that the Municipality already has an active collaboration with Legambiente Prato. For instance, in 2022 a new edition of the 'Prato Well-Kept City: I take care of it' campaign was carried out, which promoted the correct use of the city's dog-walking areas, a greater knowledge of the 'Regulations for the protection and welfare of animals in the city' and also made all dog owners aware of a more positive and mutually respectful coexistence between animals and citizens. From this point of view, in order to make the tools implemented in the emission reduction plan more effective, the Municipality intends to strengthen this collaboration with Legambiente by planning new events on sustainability issues. In addition, a few years ago the Municipality of Prato renewed an initiative in cooperation with Alia Sevizi Ambientali called 'Che Prato! More differentiated waste collection, more decorum'. The initiative aims to involve the citizens of Prato and economic activities in a process to increase information and				

		environmental awareness, improve the quality of separate waste collection, reduce litter and promote the city's decorum This series of events, along with other initiatives, will continue to be a key moment to inform and actively involve all stakeholders towards a sustainable transition and the achievement of mitigation targets by 2030.				
		Governance & Policy: **Purchasing Groups** Purchasing Groups represent communities of citizens united in a wide range of initiatives to promote an ecological and responsible lifestyle. The primary objective of Purchasing Groups is often to obtain discounts or advantageous conditions through collaboration and group strength. One example is the Solidarity Purchasing Groups (SPG) whose peculiarity lies in the fundamental principle of solidarity, which materializes through close collaboration with small local producers sharing values of respect for the environment and for people. This movement, rooted in environmental and social awareness, obtains increasing support from municipal administrations that promote its spread through patronage and active support. Within this initiative, other categories of Purchasing Groups have been defined in recent years, which aim to extend their action beyond the traditional procurement of foodstuffs. In particular, focusing on the Parto area, the objective is to	Started	Started		

		create the conditions to form citizens' purchasing groups for the realization of photovoltaic/solar thermal systems, replacement of boilers, insulation, purchase of certified green energy and purchase of electric cars. The phases of the initiative are subdivided as follows: - communication campaign: within six months of launch; - collecting pre-applications from households or small businesses; - defining an agreement with installers and banks; - assistance to households and businesses by means of on-site inspection and feasibility; - appointing each customer with a trio of approved installers; -free adherence to the proposals of the partner banks by users. In the context of green electricity, Purchasing Groups are now widespread throughout the country, especially with regard to the construction and installation of photovoltaic systems on roofs and small privately owned land. One example is the GASEnergy Association, the association's main objectives are: -promotion of savings and efficiency as the main renewable sources; -purchase of certified green electricity; -promotion of self-production by individuals and territories; -promotion of projects of particular significance. Purchasing Groups can negotiate with energy suppliers to obtain discounted rates or special conditions for group members. This can be done				

		through the collective purchase of large quantities of energy, which allows members to benefit from lower prices than they could obtain individually. In the case of PV installation, Purchasing Groups can negotiate with suppliers and installers to obtain group discounts on the purchase and installation of solar panels. This collective approach allows members to access sustainable technologies at a more affordable cost, promoting the widespread adoption of renewable energy solutions. With regard to the purchase of electric cars, GAs can negotiate with dealers or directly with manufacturers to obtain group discounts on the purchase of zero-emission vehicles. This type of collaboration gives members access to cheaper automotive technology, while encouraging the adoption of environmentally friendly vehicles.				
		Governance & Policy: **Digital Twin of the city of Prato:** The action envisages the creation of a digital model of the city of Prato as a simulation tool in digital-twin logic, consisting of a set of monitoring data and mathematical models capable of reproducing the general biophysical and biochemical environmental behavior of the urban fabric, and thus the interactions between the atmosphere, vegetation, urbanized areas and air quality. The process involves the implementation of four strategies, namely:				

		- Environmental digital twin: To realize a digital model of the city of Prato as a simulation tool in digital-twin logic, consisting of a set of monitoring data and mathematical models able to reproduce the biophysical and biochemical behavior of the urban fabric, and thus the interactions between the atmosphere, vegetation, urbanized areas, and air quality. The digital-twin becomes a tool on which to verify the climatic and environmental impact of the urban system, to implement scenario analyses and governance policies, and to obtain a benchmarking between alternative proposals of intervention to maximize the return on investments and accelerate the approach to the environmental and climate neutrality objectives envisaged in the Green Deal; - Energy digital twin: To build a reference data structure that can be used for the realization of the environmental digital twin of the territory and that will subsequently allow the realization of a system, rapidly updatable, capable of devising new innovative services; -Digital twin building stock: To develop a virtuous process that accelerates the ecological and digital transition, activating an innovative system capable of supporting the regeneration of public buildings and orienting them towards environmental sustainability, public awareness and well-being. -Digital twin school buildings: To develop a capillary monitoring system makes it possible to decrease the risk of contagions while maintaining the quality of the environments, through				

		management based on objective data and information, also contributing to the digitisation of infrastructures in a smart-city logic. Definition and implementation of an air quality monitoring network inside school buildings aimed at optimal management of environments from the point of view of safety, air quality and climatic comfort.				

Overall, the 2030 target is an **83% reduction in emissions compared to the 2019 baseline.**

The graph below shows the % emission reductions for each sector. It should also be borne in mind that there are several actions within the plan that are not associated with directly quantifiable impacts in terms of CO2 emission reductions, but which, in addition to their ability to feed into other actions, are likely to increase the plan target.

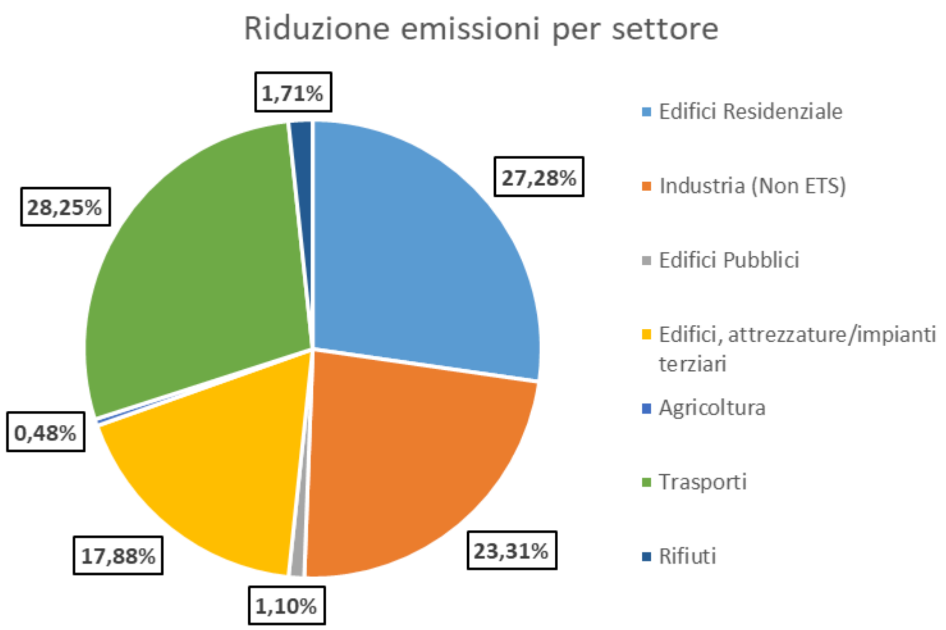


Figure 6 - Percentage distribution of emission reduction by sector.

B-1.2: Description of impact pathways– textual and visual elements							
Settore	**Numero**	**Azione**	**MWh_{th} risparmiati**	**MWh_{el} risparmiati**	**t CO2 risparmiate**	**Incremeto MWh elettrici**	**MWp fotovoltaico installati**
Residential	1.1	**Energy requalification of private residential buildings**	40.000	0	8.166	1.658	57
	1.2	**Replacing boilers with heat pumps**	218.785	0	44.195	112.198	
	1.3	**Replacing gas hobs with induction hobs**	56.157	0	11.344	35.099	
	1.4	**Replacing an obsolete household appliance for low-income households**	0	679	262	0	
	1.5	**Replacement of fluorescent lamps with LED lamps in residential buildings**	0	1.170	451	0	
	1.6	**Introduction of a permanent municipal ordinance aimed at the optimal management of air conditioning systems in residential buildings**	47.592	2.150	10.445	0	
	1.7	**Installation of photovoltaic panels on residential buildings**	0	68.776	26.479	0	
	1.8	**Purchases of green electricity to cover residential electricity needs**	0	275.104	105.915	0	
Industry	2.1	**Ecological transition of the industrial district (Macrolotto**	0	128.128	49.329	0	130

		1, Macrolotto 2 and Artisan Areas)					
	2.2	**Production from RES in other industrial areas**	0	12.000	4.620		
	2.3	**Energy efficiency of companies in the textile district**	218.970	48.748	63.002	0	
	2.4	**Adhesion of the Textile District to specific programmes in line with Net Zero initiatives for the reduction of thermal and electrical consumption excluding RES**	166.322	12.041	38.233	0	
	2.5	**Positive Energy District' at consortium level**	0	0	0	0	
	2.6	**Purchasing green electricity in the industrial sector**	0	157.566	60.663	0	
Municipality	3.1	**New energy service**	5.445	0	1.100	0	3
	3.2	**Efficiency enhancement / re-lamping of sports facilities**	1.113	0	225	0	
	3.3	**Re-lamping of lighting systems of outdoor and outdoor sports fields**	0	0	0	0	
	3.4	**Re-lamping of swimming pool and indoor lighting systems**	0	6.000	2.310	0	
	3.5.1	**Energy requalification of ordinary lighting systems**	0	82,5	31,76	0	

		serving Palazzo Benassai and the Town Hall					
	3.5.2	**Energy requalification of ordinary lighting installations serving other public buildings**	0	3.057	1.177	0	
	3.6.1	**Redevelopment of Public Residential Housing (ERP) carried out**	0	0	0	0	
	3.6.2	**Redevelopment of Public Residential Housing for Housing Assistance (ERP) planned**	0	0	0	0	
	3.7	**Photovoltaic panel installation**	0	3.600	1.386	0	
	3.8	**Purchases of green electricity to cover the electricity needs of municipal buildings and public lighting**	0	7.374	2.839	0	
Tertiary	4.1	**Replacing boilers with heat pumps in tertiary buildings**	18.828	0	3.803	6.276	57
	4.2	**Introduction of a municipal ordinance aimed at the optimal management of heating systems in tertiary activities**	2.069	1.125	836	0	
	4.3	**Photovoltaic panel installation**	0	68.135	26.232	0	
	4.4	**Purchases of green electricity to cover the**	0	272.542	104.929	0	

		electricity needs of the tertiary sector					
Agriculture	5.1	**Purchases of green electricity to cover the electricity needs of the tertiary sector**	5.691	0	1.519	0	185,738
	5.2	**Modernisation of agricultural machinery and vehicle fleet**	2.845	0	759,9	0	
	5.3	**Agrivoltaic**	0	222.886	85.811	0	
	5.4	**Purchases of green electricity to cover the electricity needs of the agricultural sector**	0,00	2.766	1.064,76	0	
Mobility	6.1	**Strengthening the local public transport system**	269.080	0	68.750	35.000	6
	6.2	**Strengthening urban road infrastructure**	46.701	0	11.932	0	
	6.3	**Strengthening the pedibus and enhancing urban school transport**	7.339	0	1.875	0	
	6.4	**Introduction of carpooling, car sharing, bike sharing and electric scooters**	3.669	0	937,5	0	
	6.5	**Strengthening railway transport Florence-Prato Valbisenzio**	80.357	0	20.531	0	
	6.6	**Strengthening suburban transport**	91.487	0	23.375,00	0	
	6.7	**“Last Mile” initiative**	102.740	0	26.250	14.249	

	6.8	**Replacement of internal combustion vehicles by electric vehicles**	113.456	0	28.987,92	19.486	
	6.9	**Construction of electricity columns**	0	0	0	0	
	6.10	**Modernisation of the municipal fleet**	462	0	118	0	
	6.11	**Increasing soft mobility by expanding and improving the city's cycle network and incentivising the purchase of bicycles**	20.528	0	5.245	0	
	6.12	**Hub Prato**	0	0	0	0	
	6.13	**Installation of photovoltaic panels for the electricity needs of the mobility sector**	0	7.200	2.772,00	0	
	6.14	**Green electricity purchases for the electricity needs of the mobility sector**	0	55.260	21.275	0	
Waste	7.1	**Installation of photovoltaic panels for waste electrical needs**	0	1.800	693	0	1,5
	7.2	**Purchases of green electricity for the electricity needs of the waste sector**	0	31.900	12.282	0	
Compensation		**Urban Forestry**	0	0	33.000	0	

3.2 Module B-2 Climate Neutrality Portfolio Design

Module B-2 "Climate Neutrality Portfolio Design" should contain a project description for **each intervention planned**, including interventions by local businesses and industry, according to the template B-2.1, including actions targeted at enhancing carbon sinks to address residual emissions. Narrative analysis and comments can be provided in B-2.2. A summary of how residual emissions are addressed, should be provided in B-2.3.

B-2.1: Description of action portfolios - textual or visual		
Fields of action	Portfolio description	
	List of actions	Descriptions
Residential buildings	1.1 Energy requalification of private residential buildings	The intervention involves the complete energy requalification of private buildings, including the optimisation of the building envelope and heating/air conditioning systems
	1.2 Replacing boilers with heat pumps	The intervention envisages the replacement of boilers with heat pumps, with the aim of involving 85% of private buildings not included in the complete energy requalification intervention (a total of 34,855 homes)
	1.3 Replacing gas hobs with induction hobs	The intervention includes the replacement of gas hobs with induction hobs of energy class at least A+ for about 78.000 private homes
	1.4 Replacing an obsolete household appliance for low-income households	The intervention involves the replacement of an obsolete household appliance (chosen from ovens, fridges, dishwashers and washing machines) with a utility of at least class A+
	1.5 Replacing fluorescent lamps with LED lamps in residential buildings	The intervention includes the replacement of fluorescent lamps with LED lamps
	1.6 Introduction of a municipal regulation	It is planned to introduce a new municipal regulation that will define restrictions concerning the use of heating systems
	1.7 Photovoltaic panel installation on residential buildings	Total estimated electricity consumption to 2030 of approximately 346.000 MWh, 20% of which will be covered by photovoltaics for a total of 69.200 MWh and a total capacity of approximately 58 MWp
	1.8 Purchases of green electricity to cover residential electricity needs	A contractual change is envisaged with the addition of specific criteria for electricity purchases, with the aim of reaching the target of 100% green energy purchases with Guarantees of Origin (GO) to cover 80% of the sector's energy needs
Industries (excluding ETS)	2.1 Ecological Transition of the Industrial District (Macrolotto 1, Macrolotto 2 and Artisan Areas**)**	Photovoltaic panels are to be installed in industrial macro-lot 1, macro-lot 2 and craft areas
	2.2 Production from RES in other industrial areas	In addition to the redevelopment measures envisaged in the structural plan in Macrolotto 1, Macrolotto 2 and the Artisan Areas, the

		Municipality also plans a targeted action in the other industrial areas in the Prato territory, aimed at the installation of photovoltaic modules for production from RES.
	2.3 Energy efficiency of textile district companies	It is planned to improve the energy consumption of companies in the Prato textile district through energy efficiency measures. In the possible interventions, self-producing energy plants were excluded (since they are accounted for in a specific action).
	2.4 Textile District's adhesion to specific programmes in line with Net Zero initiatives to reduce thermal consumption	The Science-Based Target Initiatives (SBTI) initiative, a collaboration between CDP, the UN Global Compact, the World Resources Institute (WRI) and the World Wide Fund for Nature (WWF), involves energy-intensive companies with a current electricity consumption of at least 138.000 MWh electrical and a thermal consumption of 322.000 MWh thermal. The company path defined by the SBTI Standard Companies that have already implemented energy efficiency actions through energy efficiency bonuses are excluded from the sample.
	2.5 Feasibility studies for the realization of the Positive Energy District	Feasibility studies are planned in order to assess the potential and necessary actions to realise "Positive Energy District" at consortium level
	2.6 Purchasing green electricity in the industrial sector	Certified green electricity with Guarantees of Origin (GO) is expected to cover 80% of the sector's energy needs by 2030
Public Buildings	3.1 New energy service	Entrusting the management and maintenance service of the thermal power plants of municipal buildings with technological improvements and building and plant energy upgrading
	3.2 More efficient systems in sports facilities	It is planned to replace old thermal energy production systems with more efficient systems in sports facilities
	3.3 Re-lamping of outdoor and outdoor sports field lighting systems	The action envisaged in the plan, in particular, involves the gradual re-lamping of the lighting systems of outdoor sports grounds with the introduction of dimming or dimming systems
	3.4 Efficiency enhancement / re-lamping of lighting systems in swimming pools and indoor rooms	Efficiency enhancement / re-lamping of lighting systems in swimming pools and indoor rooms

	3.5.1 Energy requalification of ordinary lighting installations: Palazzo Benassai and Municipal Palace	The Action envisages the replacement of existing old lighting fixtures (fluorescent tubes) serving municipal buildings with high-efficiency LED luminaires.
	3.5.2 Energy requalification of ordinary lighting installations serving other public buildings	In the Prato area, several schools, office districts and municipal buildings are still equipped with fluorescent tubes, and a plan has been drawn up for the gradual replacement of the current lighting fixtures with LEDs.
	3.6.1 Redevelopment of Public Residential Housing for Housing Assistance (ERP) **1st Intervention Blocki**	As part of the energy reduction plan, specific strategies were implemented to improve the efficiency of Public Residential Housing. Between 2014 and 2020, 498 pre-existing boilers were replaced with condensing models, showing a significant reduction in consumption in the following two years. In addition, targeted work was carried out on three buildings in Via del Girasole, with the replacement of single-glazed wooden window frames with new high-performance PVC frames. Similar improvements were made in three other buildings in Via del Malfante, involving a total of 20 ERP dwellings, with the replacement of wooden window frames with new energy-efficient white PVC frames
	3.6.2 Redevelopment of Public Residential Housing for Housing Assistance (ERP) **2nd Intervention Blocks**	Future energy efficiency actions are planned at the Public Residential Housing buildings at Via del Girasole 26/1-2-3 and Via del Malfante 71 between 2022 and 2026, with similar interventions such as thermal insulation, roof insulation, thermoregulation systems and replacement of boilers. These interventions will lead to an advancement of three energy classes from F to C. In the period 2022-2026, interventions are planned on two buildings at Via Rubieri 49-55 and Via Zipoli 23/29, involving 48 Public Residential Housing dwellings, upgrading from energy class G to E. Other interventions have been started in the context of the 110% Superbonus, with works on Via Capitini 1-13 and Via Parini 16-18, involving 54 and 24 dwellings, upgrading from class G to E. A further intervention on Via Rondine 16, involving 6 dwellings, took the building from energy class G to E. The reductions in consumption and emissions are accounted for in the residential buildings sector
	3.7 Photovoltaic Panel Installation	It is planned to install photovoltaic panels with a total capacity of about 3 MWp, of which about 1.990 kWp at a depleted landfill site

	3.8 Purchases of green electricity to cover the electricity needs of municipal buildings and public lighting	A contractual change is envisaged with the addition of specific criteria for the purchase of electricity, with the aim of reaching the target of 100% green energy purchases with Guarantees of Origin (GO) covering 80% of the value of the EIB, net of the efficiency and photovoltaic interventions installed under SBTI
Buildings, equipment/tertiary installations	4.1 Replacing boilers with heat pumps in tertiary buildings	Replacement of boilers with heat pumps, with the aim of involving large enterprises and energy-intensive businesses, which are responsible for about 50 per cent of the heating consumption in the tertiary sector
	4.2 Introduction of a municipal regulation aimed at the optimal management of air conditioning systems in tertiary activities	Introduction of a municipal regulation aimed at the optimal management of heating systems in tertiary activities with set point obligations
	4.3 Installation of photovoltaic panels to cover the electricity needs of the tertiary sector	It is planned to install photovoltaic panels on the useful roof areas of tertiary activities with a total capacity of about 57 MWp and an expected output of about 68.360 MWh of electricity
	4.4 Purchases of green electricity to cover the electricity needs of the tertiary sector	It is planned to purchase certified green electricity with Guarantees of Origin (GO) to cover 80% of the sector's energy needs by 2030 for a total of 273.422 MWh of electricity.
Agriculture, Fisheries and Forestry	5.1 Replacing diesel agricultural tractors with biodiesel tractors	Replacement of 60% of diesel agricultural tractors with biodiesel tractors.
	5.2 Modernisation of agricultural machinery and vehicle fleet	It is planned to modernize agricultural machinery and the vehicle fleet with conversion of obsolete vehicles to more efficient ones (excluding tractors considered in action 5.1), of farms responsible for a total thermal consumption of at least 3.000 MWh thermal.
	5.3 Agri-Voltaic Installation	The specific intervention involves the installation of 350W agri-voltaic modules for a total of about 190 MWp. This power would use about 7% of the agricultural area of the Prato territory.
	5.4 Purchases of green electricity to cover the electricity needs of the agricultural sector	A contractual change is planned with the addition of specific criteria for electricity purchases, in order to reach the target of 100% green energy purchases with Guarantees of Origin (GO) covering 80%.
Transport	6.1 Strengthening the local public transport system	One of the most important strategies envisaged to reduce the use of private vehicles within the Municipality of Prato is based on the strengthening of the local public transport (LPT) system, with the aim of increasing LPT use from the current 6% to 50% by 2030

	6.2 Infrastructure enhancement to facilitate access to LPT	The objective of the action is therefore to strengthen the main road network in order to limit the improper use of the local road network by reducing, within the latter, the so-called 'through traffic', i.e. that component that has crossed the dense city to reach a destination outside it. In quantitative terms, the purpose is to reduce local traffic using private vehicles with internal combustion engines (car/motorbike/vans), with the goal of reducing its use from the current 82% to 26% by 2030.
	6.3 Strengthening the pedibus and enhancing urban school transport	It is planned to enhance: pedibus service, to increase from 500 to 5 thousand trips per day; School transport from 1.600 to 5.000 trips per day
	6.4 Introduction of carpooling, car sharing, bike sharing and electric scooters	Introduction of carpooling, car sharing bike sharing and electric scooters to reach 5.000 trips per day.
	6.5 Strengthening railway transport Florence-Prato and Valbisenzio	As a further action aimed at reducing the use of private cars with internal combustion engines, the Municipality plans to upgrade the Florence-Prato and Valbisenzio railway line with the goal of reaching 10.000 journeys per day
	6.6 Strengthening suburban transport	Targeted actions are planned to improve suburban transport, with the aim of reducing daily travel by private internal combustion vehicles. One of the actions includes the expansion of suburban public road transport services, aiming for a 20% increase in utilization by 2030 compared to current levels. In addition, another initiative focuses on suburban school transport, aiming to upgrade the service and increase usage by 20% by 2030. Both actions aim to promote sustainable alternatives to reduce the environmental impact of transport.
	6.7 Last Mile Initiative	Through the 'Last Mile' initiative, the aim is to limit access to the city center for vehicles used for goods transport, thus avoiding around 84.000 daily trips by internal combustion vehicles
	6.8 Replacing combustion cars with electric cars.	The action envisages the replacement of 50% of local daily trips made by private cars assessed as residual after all the actions planned with reference to the strengthening of Local Public Transport and the improvement of urban roads
	6.9 Construction of electricity columns	Around 4.000 electric columns are planned for the territory of the Municipality of Prato
	6.10 Modernisation of the municipal fleet	Modernisation of the municipal fleet

	6.11 Increasing soft mobility by expanding and improving the city's cycle network in accordance with the provisions of the municipal cycle plan and by incentivising the purchase of bicycles	Expansion and improvement of the city's cycle network according to the municipal cycle plan and purchase of bicycles
	6.12 Prato Hub	With regards to local public transport, the PUMS scenario proposes interventions of particular relevance to the transport offer aimed at integrating the urban and extra-urban dimensions of public mobility services and networks
	6.13 Photovoltaic panel installation	With regard to self-production from RES related to the mobility sector, a detailed analysis was conducted based on the evaluation of the actual potential of the Prato territory. The analysis revealed an actual potential for the installation of photovoltaic systems on suitable surfaces of mobility-related facilities, in particular car parks and stations, with the goal of achieving a total capacity of about 6 MWp.
	6.14 Purchases of green electricity	Certified green electricity with Guarantees of Origin (GO) is expected to cover 80% of the mobility sector's energy needs by 2030
Waste	7.1 Photovoltaic Panel Installation	Based on the information gathered by the two groups, photovoltaic panels with a total capacity of around 1.5 MWp are expected to be installed by 2030
	7.2 Purchases of green electricity	Certified green electricity with Guarantees of Origin (GO) is expected to meet all energy consumption in the waste sector by 2030. This would mean a commitment by the two companies Alia S.p.A. and G.I.D.A. to purchase certified green energy.

RESIDENTIAL BUILDINGS

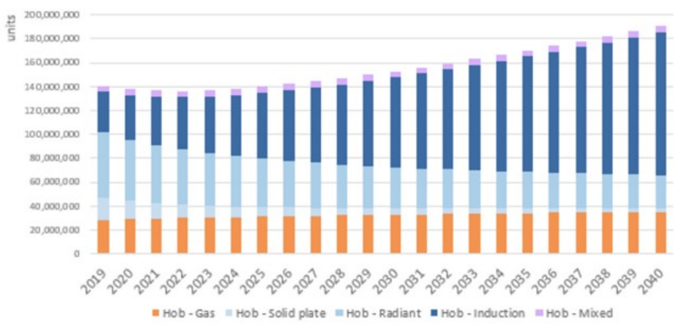
B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
1.1 Action outline	Action name	Energy requalification of private residential buildings
	Action type	Technical interventions
	Action description	The intervention involves the complete energy upgrading of private buildings, including the optimisation of the building envelope and heating/air conditioning systems. The upgrading measures include the implementation of advanced solutions to improve the building's thermal insulation. In parallel, heating and air conditioning systems will be optimized to reduce energy consumption and maximize the overall efficiency of the building and system. The action does not consider the installation of self-producing energy systems. Currently, approximately 60% of the Municipality's residential buildings are in the lowest energy class G. As part of the proposed European Directive on the energy performance of buildings, ambitious targets for improving the energy efficiency of buildings are included. It is expected that by 2030 at least 16% of non-residential buildings will outperform the worst performers, increasing to 26% by 2033. For residential buildings, the aim is to reduce the energy consumption of the building stock by 16% by 2030 and between 20% and 22% by 2035. In addition, 55% of this reduction is to be achieved by renovating the least efficient buildings. Specifically, public and non-residential buildings should be renovated and upgraded to at least energy class F by 2027 and at least class E by 2030. Residential buildings should be refurbished to become at least class G to at least class F by 2030 and at least class E by 2033. Member States must then set specific timetables for the transition to higher energy performance classes by means of new national building renovation plans, in line with the path they have set for themselves to have a zero-emission building stock by 2050. The Municipality of Prato will encourage this action with measures such as the energy desk, information and awareness campaigns, building

		regulations, energy planning and bureaucratic simplification. These measures will aim to: - facilitate the authorisation process -oblige action to be taken before national obligations or achieving higher performance values than national ones - make known all the possible incentives that can be accessed to finance the type of intervention concerned - raise awareness among stakeholders for change
Reference to impact pathway	Field of action	Residential Buildings (Built Environment)
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	450 apartment blocks involved by 2025 900 condominiums involved by 2027
Implementation	Responsible bodies/person for implementation	Energy Policy Office, Private Building Office
	Action scale & addressed entities	The entities that will be most affected will be the apartment blocks selected as target groups for the action, the owners or occupants of the private buildings subject to the efficiency measures for the building envelope and heating/air conditioning systems. In addition to apartment blocks, institutions that collaborate or support the implementation of the initiative will be involved, as well as companies specializing in energy and construction, suppliers of efficient materials and technologies, and energy consultants.
	Involved stakeholders	Municipality of Prato Citizenship Companies specializing in building renovation Sustainable condominiums Estra
	Comments on implementation	It should be noted that 1.210 permits have been applied for in the last two years. Number of apartment buildings affected approx. 1650 out of approx. 22.000 A representative cost for building envelope and plant upgrading of €470.000 was assumed, 40% of which was borne by private individuals

		In Italy there is an incentive system that allows access to tax deductions for carrying out such interventions
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	40.000 MWh of methane gas saved
	GHG emissions reduction estimate (total) per emission source sector	8.166 tCO2/year
	Total costs and costs by CO2e unit	€ 777 million 95.252 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
1.2 Action outline	Action name	Replacing boilers with heat pumps
	Action type	Technical interventions
	Action description	The intervention envisages the replacement of boilers with heat pumps, with the aim of involving 85% of private buildings not included in the complete energy requalification intervention (Sheet 1.1). According to the National Integrated Energy and Climate Plan (NIPEC), a strengthening of policies to promote energy efficiency in the residential sector is envisaged at national level. This involves achieving a redevelopment of the existing building stock. A crucial aspect for the reduction of building-related emissions concerns the more widespread adoption of heat pumps as the primary heating system. Heat pumps represent advanced technological solutions that allow not only heating but also room air conditioning and domestic hot water production. In addition, the development of heat pumps and the electrification of other uses will be favored by the increasing spread of domestic photovoltaic systems. This technology plays a strategic role in the air-conditioning of civil buildings in the Prato area, as it maximizes energy efficiency and reduces environmental impact. The Municipality of Prato will encourage this action with measures such as the energy desk, information and awareness campaigns, building regulations, energy planning and bureaucratic simplification. These measures will aim to: - facilitate the authorisation process -oblige action to be taken before national obligations or achieve higher performance values than national ones - make known all the possible incentives that can be accessed to finance the type of intervention concerned - raise awareness among stakeholders for change
Reference to impact pathway	Field of action	Residential Buildings (Built Environment)
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	5.000 boilers replaced by 2025 15.000 boilers replaced by 2027
Implementation	Responsible bodies/person for implementation	Energy Policy Office, Private Building Office

	Action scale & addressed entities	Residential building owners are the main actors involved in this operation. They are joined by heat pump suppliers and installers, i.e. those physically replacing existing boilers with heat pumps. In Italy there is an incentive system that allows access to tax deductions for such interventions or alternatively to the Conto Termico.
	Involved stakeholders	Municipality of Prato Citizenship Companies specializing in building renovation Estra
	Comments on implementation	assumption 85% of dwellings that are covered by previous redevelopments (a total of 34.855 dwellings)
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	218.785 MWh of methane gas saved
	GHG emissions reduction estimate (total) per emission source sector	44.195 tCO2/year
	Total costs and costs by CO2e unit	€ 207 million 4.683 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
1.3 Action outline	Action name	Replacing gas hobs with induction hobs
	Action type	Technical interventions
	Action description	With a view to improving household heat consumption efficiency, the replacement of traditional hobs with induction hobs certainly plays a key role. This intervention would lead to an increase in heat exchange efficiency, due to the fact that induction hobs directly heat the cooking vessel, guaranteeing maximum energy efficiency (lower energy consumption for the same amount of heat transmitted), with a reduction in average cooking times. In addition, the conversion of thermal consumption into electrical consumption would allow the needs to be covered by green energy (self-produced and/or purchased). Currently, in Italy, the purchase of an induction hob can benefit from the furniture bonus, with a tax deduction of 50% over 10 years (with an expenditure ceiling of €8,000 for 2023 and €5.000 for 2024, as part of renovation work). Induction hobs are expected to increase significantly in the European market by 2040, and are expected to be the most widespread technology in the coming years, as shown in the graph below.  **Figure: European hob market trends. Source: FIRE** The intervention identified for the Municipality of Prato involves the replacement of gas hobs with induction hobs of energy class at least A+.
Reference to impact pathway	Field of action	Residential Buildings (Built Environment)
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	10,000 gas hobs replaced by 2025 30,000 gas hobs replaced by 2027

Implementation	Responsible bodies/person for implementation	Energy Policy Office, Private building office
	Action scale & addressed entities	Municipality of Prato Citizenship Companies specializing in the sale of induction hobs
	Involved stakeholders	The citizens of the Municipality of Prato are the main actors involved in this operation. They are joined by induction cooker suppliers and the Municipality of Prato for the provision of incentives.
	Comments on implementation	77,997 total number of households - let's assume 90 % of households making the substitution - savings 30 % on the old plan (source ENEA)
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	56,157 thermal MWh of methane gas saved
	GHG emissions reduction estimate (total) per emission source sector	11.344 tCO2
	Total costs and costs by CO2e unit	€ 56 million 4.936 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
1.4 Action outline	Action name	Replacing an obsolete household appliance for low-income households
	Action type	Technical interventions
	Action description	In the current context, a large part of a household's energy consumption is directly related to the use of obsolete, low energy class appliances. This problem is further exacerbated by the fact that many households are unable to replace these appliances due to financial constraints. The cost incurred by households for energy consumption could be reduced through the adoption of more efficient appliances. To address this challenge, specific support actions for low-income households should be identified, providing them with access to more modern and sustainable technologies. This would not only help reduce long-term costs, but also promote greater energy efficiency and mitigate the negative environmental impact associated with the use of low-efficiency appliances. In this context, the action identified for the Municipality of Prato envisages the replacement of an obsolete household appliance (chosen from ovens, fridges, dishwashers and washing machines) with a class at least A+ for low-income households. The Municipality will undertake to find the funds for an annual call for tenders to incentivise the purchase of higher efficiency appliances, which will be repeated until 2030. These annual calls for tenders offer continuity in assisting households, promoting the use of energy-efficient technology and contributing to the long-term reduction of energy consumption in the Municipality. This action not only aims to have a positive impact on the environment, but also to provide support to low-income households with a positive effect on the household economy in the long run.
Reference to impact pathway	Field of action	Residential Buildings (Built Environment)
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	1.000 household appliances replaced by 2025 3.000 appliances replaced by 2027
Implementation	Responsible bodies/person for implementation	Energy Policy Office, Private Building Office

	Action scale & addressed entities	Municipality of Prato Citizenship Companies specializing in the sale of household appliances
	Involved stakeholders	The citizens of the Municipality of Prato are the main actors involved in this operation. They are joined by the suppliers of household appliances and the Municipality of Prato for the provision of incentives
	Comments on implementation	77,997 total number of households - let's assume 10% of households making the replacement - €500 incentive - 30% saving on the old appliance (source ENEA)
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	679 MWh of electricity saved
	GHG emissions reduction estimate (total) per emission source sector	262 tCO_2
	Total costs and costs by CO2e unit	€5.4 million 20.924 €/tCO_2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
1.5 Action outline	Action name	Replacement of fluorescent lamps with LED lamps in residential buildings
	Action type	Technical interventions
	Action description	Energy consumption related to room lighting typically accounts for a significant share of total household consumption, ranging from 10% to 60% of total consumption in homes In view of sustainability, it is crucial to increase the energy efficiency of lighting devices and maximize the use of natural light in order to reduce the energy demand and thus the environmental impact of buildings. In recent years, developments in production cycles have offered considerably more efficient alternatives to conventional lamps. LED lamps provide vastly superior energy efficiency and compensate for higher initial costs with an extremely longer service life. The high-efficiency lamp market has experienced sustained growth in the past years and It is estimated to continue to grow exponentially until 2026, thanks to product optimisation and regulatory guidelines that have banned low-efficiency lamps in the European Union for several years. In this context, the intervention identified for the Municipality of Prato envisages the replacement of low-efficiency lamps with modern high-efficiency LED lamps in private homes. LED lamps are considerably more energy efficient than fluorescent lamps, consume less energy to produce the same amount of light, thus reducing costs for the households involved and contributing to an overall decrease in energy consumption. The Municipality of Prato will encourage this action with measures such as the energy desk and information and awareness-raising campaigns.
Reference to impact pathway	Field of action	Residential Buildings (Built Environment)
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	10.000 light bulbs replaced by 2025 27.000 bulbs replaced by 2027
Implementation	Responsible bodies/person for implementation	Energy Policy Office, Private Building Office

	Action scale & addressed entities	Municipality of Prato Citizenship Companies selling electrical equipment
	Involved stakeholders	The citizens of the Municipality of Prato are the main actors involved in this operation. They are joined by the suppliers of LED bulbs and the Municipality of Prato for the provision of incentives
	Comments on implementation	Replacement of fluorescent lamps with LED lamps for 10% of the approximately 78.000 private households. An average of eight light bulbs per home was considered. 77.997 number of total households. Savings of 50% due to replacement of light bulbs taken into account. Replacement carried out on 10% of households.
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	1,170 MWh of electricity saved
	GHG emissions reduction estimate (total) per emission source sector	451 tCO_2
	Total costs and costs by CO2e unit	€ 374.386 831 €/tCO_2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
1.6 Action outline	Action name	Introduction of a permanent municipal ordinance aimed at the optimal management of heating systems in residential buildings
	Action type	Other Intervention/Governance and Policy
	Action description	It is planned to introduce a new municipal regulation that will define restrictions concerning the use of heating systems. According to this regulation, a maximum heating temperature of 19°C will be set, with a tolerance of ±2°C. In addition, the operating period of the systems will be reduced by 15 days compared to the current regulation. This will result in a delayed start of 8 days compared to the usual date and an earlier end of operation of 7 days compared to the traditional end date. The daily operating time of the plants will be reduced by 1 hour. It has been assumed that the regulation will come into force during 2024.
Reference to impact pathway	Field of action	Residential Buildings (Built Environment)
	Systemic lever	Governance & Policy
	Outcome (according to module B-1.1)	Made
Implementation	Responsible bodies/person for implementation	Energy Policy Office, Private Building Office
	Action scale & addressed entities	Municipality of Prato Citizenship
	Involved stakeholders	The citizens of the Municipality of Prato are the main actors involved in this operation together with internal staff from the administration of the Municipality of Prato who will be involved in the drafting of the regulation and in the verifications.
	Comments on implementation	During the period of the energy crisis, intervention was implemented by the Italian state
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	47.592 thermal MWh saved by 2030 2.150 MWh of electricity saved by 2030
	GHG emissions reduction estimate (total) per emission source sector	10.445 tCO_2
	Total costs and costs by CO2e unit	50.000 € 4.78€/tCO_2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
1.7 Action outline	Action name	Installation of photovoltaic panels on residential buildings
	Action type	Technical interventions
	Action description	It is planned to install photovoltaic panels on the useful surfaces of residential roofs with a total capacity of about 58 MWp and an expected output of 69.200 MWh. The sizing of the plants was based on covering 20% of the estimated energy consumption of the residential sector by 2030, which also takes into account increases in electricity consumption linked to electrification strategies and the expected benefits of energy efficiency measures. The Municipality of Prato will encourage this action with indirect measures such as the energy desk, energy annex to the building regulation, energy planning and bureaucratic simplification (described in more detail in Form C-2). Indirect initiatives aim to: - facilitate the authorisation process - oblige to carry out interventions before national obligations or achieve higher performance values than national ones - make known all the possible incentives that can be accessed to finance the type of interventions being addressed - raise awareness among stakeholders for change
Reference to impact pathway	Field of action	Residential Buildings
	Systemic lever	Technology
	Outcome (according to module B-1.1)	10 MWp installed by 2025 27 MWp installed by 2027
Implementation	Responsible bodies/person for implementation	Energy Policy Office
	Action scale & addressed entities	Municipality of Prato Citizenship Estra

	Involved stakeholders	The citizens of the Municipality of Prato are the main actors involved in this operation together with internal staff from the administration of the Municipality of Prato who will be involved in the drafting of the regulation and in the verifications.
	Comments on implementation	\
Impact & cost	Generated renewable energy (if applicable)	68.776 MWh
	Removed/substituted energy, volume or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	26.479 tCO2
	Total costs and costs by CO2e unit	€ 145 million 5.476 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
1.8 Action outline	Action name	Purchases of green electricity to cover residential electricity needs
	Action type	Technical interventions
	Action description	Certified green electricity with Guarantees of Origin (GO) is expected to cover 80% of the sector's energy needs by 2030 (estimated as described in Action 1.7), totalling 276.800 MWh. The Municipality will provide for an obligation to purchase certified green electricity for all entities that will access incentive programmes for energy efficiency measures or the construction of energy production plants from renewable sources. The Municipality is assessing the feasibility of purchasing Guarantees of Origin for electricity used by third parties to ensure the eventual achievement of the 2030 target. Finally, the Municipality will undertake to launch an awareness campaign and through the energy desk to promote the purchase of certified green energy.
Reference to impact pathway	Field of action	Residential Buildings
	Systemic lever	Technology
	Outcome (according to module B-1.1)	50.000 MWh by 2025 130.000 MWh to 2027
Implementation	Responsible bodies/person for implementation	Energy Policy Office
	Action scale & addressed entities	Municipality of Prato Citizenship
	Involved stakeholders	Citizens
	Comments on implementation	\
Impact & cost	Generated renewable energy (if applicable)	275.104 MWh
	Removed/substituted energy, volume or fuel type	\
	GHG emissions reduction estimate (total) per emission source sector	105.915 tCO_2
	Total costs and costs by CO2e unit	€ 180 million 1.699 €/tCO_2

INDUSTRIES (EXCLUDING ETS)

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
2.1 Action outline	Action name	Ecological transition of the industrial district (Macrolotto 1, Macrolotto 2 and Artisan Areas)
	Action type	Technical interventions
	Action description	As far as Prato's district companies are concerned, there is a structural plan that is currently active for Macrolotto 1 and will also become active for Macrolotto 2 and the Artisan Areas in 2025. Prato's **1st Industrial Macrolotto** is the largest industrial subdivision built in Italy in the 1980s on a totally private initiative. This industrial area extends in the southern district of the Municipality of Prato for about **150 hectares**, where today more than **700 micro** and small enterprises employ about **three to four thousand people**. Once these works and the production and office settlements envisaged by the subdivision plan were completed, the 1st Macrolotto gave rise to the company 'CONSER, consortium services of the 1st Industrial Macrolotto of Prato' to better protect the investments by qualifying the area from both the infrastructural and service points of view and to manage the centralized water recycling plant with annexed industrial and fire-fighting aqueduct. The general objective of the action is to define and implement on the area related to Macrolotto 1 strategies for the technological-environmental requalification of the industrial building heritage and the effects of the possible environmental and bioclimatic improvements deriving from them. Starting from the framework of the current urban planning forecasts for the area, the research experiments with design solutions that aim to prefigure an architectural and environmental redevelopment of Macrolotto 1, through a densification of the built environment that guarantees zero land consumption while significantly increasing the available usable surfaces, that aims to enhance urban resilience, to reduce and subtract CO2 emissions, to mitigate the urban heat island effect and to sustainably manage the runoff of rainwater on urban surfaces. In particular, the research has explored solutions for the extension of industrial buildings that go beyond the thresholds set by the Operational Plan's Technical Implementation Regulations, demonstrating the possibility of substantially increasing industrial volumes, given the unavailability of additional areas designated for this function in the Municipality, with extension scenarios that guarantee an improvement in the buildings'

energy-environmental performance and at the same time optimize land use and increase resource efficiency

Figure - Typology and boundaries of the buildings in Macrolotto 1

The general strategic actions proposed for the redevelopment of the industrial building fabric from a climate-neutral perspective, through zero land take densification, urban greening, sustainable runoff management and urban heat island mitigation in the area, concern:

- energy and environmental redevelopment with the possibility of extension of industrial buildings, with the aim of increasing the usable surface area and at the same time differentiating and improving the quality of spaces, while ensuring a substantial reduction in energy requirements and related climate-changing emissions, through:

  - Expansion of industrial buildings at zero land consumption with additions in superelevation or alternatively with construction of new volumes 'bridging' over existing buildings;
  - Energy retrofitting of building envelopes to adapt their thermal insulation capacity to current regulations with the adoption of external insulation;
  - Installation of solar renewable energy generation systems on roofs, with a raised canopy type to reduce the heat input to the building below and at the same time ensure shading of the roofs with integrated green roof technology solutions;
  - Implementation of solar renewable energy systems with canopies on car parks and in public spaces.

		- The environmental rebalancing of open spaces and urban areas, through: - Urban reforestation interventions; - Modification of road sections for the insertion of bioswales, technological-environmental systems capable of regulating and managing the stormwater cycle; - Transformation of road surfaces through the adoption of strategies and design solutions aimed at reducing the road cross-section by favoring the introduction of alternative mobility systems (public mobility and bicycle and pedestrian mobility). In view of the volume bonus, the University of Rome 'La Sapienza' carried out a study on Macrolotto 1 proposing a scenario of redevelopment and extension of industrial buildings with minimal transformation and 26% enlargement. In particular, a minimal intervention is proposed, non-invasive with respect to the existing building, with a 26% enlargement of the gross usable surface area with respect to the existing one. The intervention modalities refer to sheds with prefabricated or reinforced concrete frame structure (added together they make up 94.5% of the total) and aim at not interfering with the continuation of the activities present on site, not going to affect the inside of the buildings except punctually. The main variables taken into account when defining the interventions are the type of roofing and the length of one of the sides, less than 30 m. Two main types of interventions are proposed: - façade extensions, raised above ground level, to ensure access to the structure by vehicles and goods and not to increase land occupation, leading in some cases to the need for small portions of demolition; - bridge elevations for buildings with a side of less than 30 m, with a structure independent of the main hall and elevated approximately 2 m above the existing roof or for those greater than 30 m with the need to drill holes in the roof to insert structural pillars. The demolitions are partial, referring to the connecting sheds or to part of the office areas. In addition, existing photovoltaics are retained, when present. However, photovoltaic canopies are only to be installed on extensions, flat roofs or on the sloping part of sheds. It is proposed to install green roofs on roofs that do not accommodate photovoltaics or sheds. Starting from the energy consumption outlined above, the introduction of a photovoltaic energy grid was planned on canopies strategically positioned above the new building

elevations, strategically positioned above the industrial buildings and largely above the new extension volumes built on top, using **500 Wp** panels for a total surface area of **400,062 square meters**, **37.4%** of the total roof surface area. The total installed power is **119,779 kWp.**
Only the benefits in terms of emission reduction linked to the installation of new photovoltaic systems have been accounted for in this sheet, while, due to the absence of specific data, the potential benefits linked to the reduction of the building's energy demand (mainly linked to an improvement in the thermal insulation of the existing parts considering that the extensions will have to be zero emission net of the photovoltaic installation) have been neglected. The effects of heat island reduction fall under the specific adaptation section. Potential absorptions related to urban reforestation interventions, on the other hand, have been considered separately in the offsetting section.
The effects of heat island reduction fall under the specific adaptation section. Potential absorptions related to urban reforestation interventions, on the other hand, have been considered separately in the offsetting section.
In addition to the redevelopment in Macrolotto 1, similar projects are also planned for the district companies in **Macrolotto 2** and the **Artisan Areas from** 2025.
From the analysis conducted on the 2nd Macrolotto in Prato, it represents a vast industrial development area that was created in the 1980s thanks to private initiative. It extends over about 150 hectares in the southern district of the Municipality of Prato and hosts more than **400 micro and small enterprises**, providing employment for about **3.000 employees**.
The figure below shows the boundaries of the production buildings within Macrolotto 2.

The figure below shows the boundaries of the production buildings within Macrolotto 2.

		Figure - Typology and boundaries of the buildings in Macrolotto 2 The figure below shows that areas amounting to approximately **754.700 square meters** have been built in Macrolotto 2 in Prato. Photovoltaic emerges as a key technology for Prato's Macrolotto 2 in the coming years, as the installation of solar panels on industrial roofs offers numerous advantages. These include: 1. **Exploitation of existing space:** Industrial rooftops represent a vast available and often under-utilized area, so installing photovoltaic panels on these spaces maximizes land use without having to occupy additional land. 2. **Renewable energy production:** Photovoltaic enables the generation of clean and renewable energy. 3. **Economic benefits:** The installation of photovoltaic systems can generate significant savings on energy bills, as well as the possibility of potential incentives for renewable energy production. 4. **Corporate sustainability:** Companies within Macrolotto 2 can demonstrate a concrete commitment to environmental sustainability by integrating clean energy sources into their daily operations.  **Figure - Percentage of built-up area**

<table>
<tr><td></td><td></td><td>
<table>
<tr><th>COMPARTO</th><th>SUP. COPERTA PREVISTA</th><th>SUP. COPERTA EDIFICATA</th><th>SATURAZIONE</th><th>COLORE</th></tr>
<tr><td>A</td><td>56.673,25</td><td>56.673,25</td><td>100%</td><td></td></tr>
<tr><td>B</td><td>10.494,00</td><td>10.494,00</td><td>100%</td><td></td></tr>
<tr><td>C</td><td>67.388,85</td><td>50.514,81</td><td>75%</td><td></td></tr>
<tr><td>D</td><td>6.029,5</td><td>6029,90</td><td>100%</td><td></td></tr>
<tr><td>E</td><td>38.021,65</td><td>38.021,65</td><td>100%</td><td></td></tr>
<tr><td>F</td><td>66.898,85</td><td>60.425,85</td><td>90%</td><td></td></tr>
<tr><td>G</td><td>25.167,35</td><td>13.157,35</td><td>50%</td><td></td></tr>
<tr><td>H</td><td>10.092,3</td><td>0,00</td><td>0%</td><td></td></tr>
<tr><td>I</td><td>71.103,85</td><td>71.103,85</td><td>100%</td><td></td></tr>
<tr><td>L</td><td>24.975,25</td><td>24.975,25</td><td>100%</td><td></td></tr>
<tr><td>M</td><td>28.811,4</td><td>21.461,40</td><td>75%</td><td></td></tr>
<tr><td>N</td><td>23.457,55</td><td>23.457,55</td><td>100%</td><td></td></tr>
<tr><td>O</td><td>39.186,6</td><td>39.186,6</td><td>100%</td><td></td></tr>
<tr><td>P</td><td>31.968,95</td><td>31.968,95</td><td>100%</td><td></td></tr>
<tr><td>Q</td><td>36.664,95</td><td>36.664,95</td><td>100%</td><td></td></tr>
<tr><td>R</td><td>40.188,2</td><td>40.188,2</td><td>100%</td><td></td></tr>
<tr><td>S</td><td>67.586,3</td><td>67.586,3</td><td>100%</td><td></td></tr>
<tr><td>T</td><td>74.649,59</td><td>29.004,59</td><td>40%</td><td></td></tr>
<tr><td>U</td><td>49.247,05</td><td>49.247,05</td><td>100%</td><td></td></tr>
<tr><td>V</td><td>69.960,85</td><td>69.960,85</td><td>100%</td><td></td></tr>
<tr><td></td><td>838.566,29</td><td>740.122,35</td><td>88 %</td><td></td></tr>
</table>
In the calculation of potential savings, as a precautionary measure, only the potential related to Macrolotto 1 in the study conducted by the University of Rome La Sapienza, i.e. 119 MWp, was considered.
As early as 2024, the Municipality is committed to approving a procedure to be included in the Operational Plan to realize the extensions and associated photovoltaic installations in Macrolotto 1.
The Municipality of Prato will also encourage this action with measures such as energy planning and bureaucratic simplification, energy counter and information and awareness campaigns.
</td></tr>
<tr><td rowspan="3">Reference to impact pathway</td><td>Field of action</td><td>Industrial sector</td></tr>
<tr><td>Systemic lever</td><td>Technology/Infrastructure</td></tr>
<tr><td>Outcome (according to module B-1.1)</td><td>34 MWp installed by 2025
69 MWp installed by 2027</td></tr>
<tr><td rowspan="2">Implementation</td><td>Responsible bodies/person for implementation</td><td>Economic Development Office</td></tr>
<tr><td>Action scale & addressed entities</td><td>Municipality of Prato
Ministry of Economic Development (now Ministry of Enterprise and Made in Italy) and the Ministry of Economy and Finance</td></tr>
</table>

	Involved stakeholders	Companies in the District of Prato (Macrolotto 1, Macrolotto 2 and Artisan Areas), Chinese Community
	Comments on implementation	Study conducted by 'La Sapienza' University of Rome
Impact & cost	Generated renewable energy (if applicable)	128.128 MWh
	Removed/substituted energy, volume or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	49.329 tCO_2
	Total costs and costs by CO_2e unit	€ 238 million 4.824 €/tCO_2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
2.2 Action outline	Action name	Production from RES in other industrial areas
	Action type	Technical interventions
	Action description	In addition to the redevelopment measures foreseen in the structural plan in Macrolotto 1, Macrolotto 2 and the Artisan Areas, the Municipality also plans a targeted action in the other industrial areas in the Prato territory, aimed at the installation of photovoltaic modules for production from RES. In particular, in addition to the companies that benefited from the 'Energy Efficiency Call for Companies in the Prato-Pistoia Textile District (described in the implementation tools) specifically for the realization of photovoltaic systems in 2023, new companies are expected to be involved in the coming years. From this point of view, the Municipality intends to issue biennial calls for tenders in the future to finance new interventions as well. Higher contribution percentages will be provided for small and medium-sized enterprises within the call. A total installed potential of 10 MWp is expected from the area study. The Municipality of Prato will also promote the implementation of this action with measures such as energy planning and bureaucratic simplification, energy counter and information and awareness campaigns.
Reference to impact pathway	Field of action	Industrial sector
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	3 MWp installed by 2025 6 MWp installed by 2027
Implementation	Responsible bodies/person for implementation	Economic Development Office
	Action scale & addressed entities	Municipality of Prato Ministry
	Involved stakeholders	Pistoia-Prato Chamber of Commerce

		Companies in the Prato Textile District
	Comments on implementation	/
Impact & cost	Generated renewable energy (if applicable)	12.000 MWh electricity
	Removed/substituted energy, volume or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	4.620 tCO232
	Total costs and costs by CO2e unit	€ 20 million 4.620 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
2.3 Action outline	Action name	Energy efficiency of companies in the textile district
	Action type	Technical interventions
	Action description	The Municipality has decided to promote a series of initiatives aimed at supporting energy efficiency in the textile district until 2030. From this point of view, some 38 companies in the course of 2023 have already initiated various actions within the framework of the financing provided for within the “Energy Efficiency Call for Companies in the Prato-Pistoia Textile District”, managed by the Prato-Pistoia Chamber of Commerce and described within the financing sheets among the implementation tools. The data of the companies, that took part in the call, as well as the type of interventions carried out, were used as a basis for the evaluation of future scenarios and potential savings, foreseeing the involvement of new companies with a target of approximately 300 projects financed by 2030 (considering that of the 108 requests for funding received by the Municipality, only 38 have currently been financed to reach the maximum ceiling of 4. With this in mind, it is planned to set up a special call for tenders aimed at incentivising efficiency-boosting interventions, especially focused on the reduction of thermal and electrical consumption with particular attention to small and medium-sized enterprises, which will be encouraged through higher contribution percentages. The first category of interventions will aim to support projects to reduce thermal energy consumption within the textile district companies. This could include, for example, actions such as replacing steam generators, reusing thermal waste, insulating machinery and piping, installing systems for monitoring and rational thermal energy management, and other solutions aimed at improving efficiency in the thermal sector. At the same time, the second category of interventions will be dedicated to improving the efficiency of electricity consumption, with the aim of financing projects aimed at, for example, replacing electric motors with high-efficiency

		units, installing inverters, replacing compressors and/or improving the efficiency of compressed air distribution systems, improving the energy efficiency of production processes and lighting systems, modernizing electrical substations, and installing systems for monitoring and rational management of electricity. This initiative therefore aims to replicate the successes achieved through the already active public funding programme, with a commitment from the Municipality to renew the two-year call. In addition, participating companies will be encouraged to purchase certified renewable electricity through Guarantees of Origin, thus demonstrating their commitment to a sustainable energy transition. The Municipality of Prato will also promote the implementation of this action with measures such as energy desks and information and awareness campaigns.
Reference to impact pathway	Field of action	Industrial sector
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	85 projects funded to 2025 170 projects financed to 2027
Implementation	Responsible bodies/person for implementation	Economic Development Office
	Action scale & addressed entities	Companies in the Prato Textile District Municipality of Prato Pistoia-Prato Chamber of Commerce Chinese Community
	Involved stakeholders	The companies of the Prato Textile District are the main actors involved in this operation. They are joined by the Ministries and the Municipality of Prato for the definition and management of the incentive tenders.
	Comments on implementation	It should be noted that, with the previous call for tenders implemented by the Municipality, 38 companies have been financed to date.
Impact & cost	Generated renewable energy (if applicable)	48,748 MWh electricity 218,970 thermal MWh
	Removed/substituted energy, volume or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	63.002 tCO2
	Total costs and costs by CO2e unit	€ 105 million 1.666 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
2.4 Action outline	Action name	Adhesion of the Textile District to specific programmes in line with Net Zero initiatives
	Action type	Technical interventions
	Action description	The European Sustainability Reporting Standards (ESRSs) developed by the European Financial Reporting Advisory Group (EFRAG) introduced the obligation for large companies to draw up a sustainability report. This obligation will become increasingly stringent in the coming years until 2028, when it will also include SMEs listed on EU-regulated markets. In terms of climate change in particular, companies are required in the ESRS to provide evidence that their greenhouse gas emission reduction targets are science-based and compatible with limiting global warming to 1.5°C. One of the most popular initiatives to enable organizations to define targets and related mitigation plans in line with the objectives defined in the Paris Agreement is the Science-Based Target Initiatives (SBTI). The initiative, a collaboration between CDP, the United Nations Global Compact, the World Resources Institute (WRI) and the World Wide Fund for Nature (WWF), aims to provide a standardized and scientifically sound approach to guide companies towards a state of carbon neutrality in a manner consistent with social climate and sustainability goals and within the biophysical limits of the planet. Specifically, the SBTI Net-Zero Standard defines corporate "net-zero" as a pathway characterized by two phases: 1. Reduce emissions in Scopes 1, 2 and 3 to zero, or to a residual level consistent with achieving net-zero global emissions, or to a sector level in eligible pathways aligned to 1.5°C; 2. Permanently neutralize any residual emissions upon reaching the target year zero and any greenhouse gas emissions released into the atmosphere thereafter.

		In this context, the Municipality of Prato plans to find the necessary funds to provide grants to incentivise local companies to sign up for voluntary programmes in line with Net Zero initiatives (e.g. SBTI) It is planned to involve a total of energy-intensive companies with a total current electricity consumption of at least 138.000 MWh electrical and a total thermal consumption of 322.000 MWh thermal. Companies that adhere to the programme defined by the Municipality will have to commit to building plants for the production of energy from renewable sources and also to purchasing certified renewable electricity through Guarantees of Origin. The Municipality of Prato will also promote the implementation of this action with measures such as energy counters and information and awareness campaigns.
Reference to impact pathway	Field of action	Industrial sector
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	Involvement of companies with a total consumption of at least 50.000 MWh thermal and 25.000 MWh electrical Involvement of companies with a total consumption of at least 135.000 MWh thermal and 60.000 MWh electrical
Implementation	Responsible bodies/person for implementation	Economic Development Office
	Action scale & addressed entities	Companies in the Prato Textile District Municipality of Prato
	Involved stakeholders	The companies of the Prato Textile District are the main actors involved in this operation. They are joined by the Municipality of Prato, for the definition and management of incentive calls and awareness-raising activities, and energy consultants who will support the companies in calculating their emissions.
	Comments on implementation	For the calculation of costs, the tCO2/€ ratio was used
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	12,041 MWh electricity 166,322 thermal MWh
	GHG emissions reduction estimate (total) per emission source sector	38.233 tCO2

	Total costs and costs by CO2e unit	€ 64 million 1.673 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
2.5 Action outline	Action name	Feasibility studies for the realization of 'Positive Energy District' at consortium level
	Action type	Other intervention
	Action description	Positive Energy District' refers to an industrial area that uses advanced technologies to optimize energy use, improve efficiency and reduce environmental impact. Clusters often integrate renewable energy sources, implement intelligent energy management systems and promote technological innovation. The aim is to reduce energy costs, improve sustainability and increase the competitiveness of industries in the area. From this point of view, the action plan envisages a commitment by the Municipality of Prato to find the necessary resources to finance feasibility studies for PEDs in Macrolotto 1, Macrolotto 2 and Artisan Areas through specific agreements with the managing bodies (e.g. Conser and Confartigianato). Entities eligible for funding will be consortia or clusters of companies in a specific territorial context.
Reference to impact pathway	Field of action	Industrial sector
	Systemic lever	Governance and Policy
	Outcome (according to module B-1.1)	Started in 2025 Realised to 2027
Implementation	Responsible bodies/person for implementation	Economic Development Office
	Action scale & addressed entities	Companies in the Prato Textile District Municipality of Prato
	Involved stakeholders	The companies of the Prato Textile District are the main actors involved in this operation. They are joined by the Municipality of Prato, for the definition and management of incentive calls and awareness-raising activities, and energy consultants who will support the companies in calculating their emission.s
	Comments on implementation	Similar initiatives have already been implemented in Italy for industrial districts, with the implementation of Ecologically Equipped Production Areas, i.e. industrial areas equipped with the necessary infrastructure and systems to guarantee health, safety and environmental protection.
Impact & cost	Generated renewable energy (if applicable)	/

	Removed/substituted energy, volume or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	/
	Total costs and costs by CO2e unit	€ 150.000

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
2.6 Action outline	Action name	Purchasing green electricity in the industrial sector
	Action type	Technical interventions
	Action description	In addition to the electricity produced in the interventions described in Sheets 2.1 and 2.2, as a further strategy with a view to neutralizing residual emissions linked to the consumption of electricity in the industrial sector, specific action is planned on the type of supply contracts. Specifically, the action envisages the purchase of certified green electricity with Guarantees of Origin (GO) to cover 80% of the industrial sector's energy needs by 2030, totalling about 160,000 MWh. From this point of view, the Municipality of Prato will commit itself to: • introduce an obligation to purchase certified green electricity for all entities that will access incentive programmes for energy efficiency measures or the construction of renewable energy production plants; • initiate discussions with specialized operators to assess the feasibility of purchasing Guarantees of Origin to cover electricity used by third parties in order to guarantee the eventual achievement of the 2030 target; • stimulate this action with information and awareness-raising measures such as energy desks and communication campaigns.

Reference to impact pathway	Field of action	Industry/Industrial sector
	Systemic lever	Industrial sector
	Outcome (according to module B-1.1)	50,000 MWh green energy purchased by 2025 100,000 MWh green energy purchased by 2027
Implementation	Responsible bodies/person for implementation	Economic Development Office Energy Policy Office
	Action scale & addressed entities	/
	Involved stakeholders	Municipality of Prato Companies in the Prato Textile District Energy Consultants
	Comments on implementation	After consulting an energy supplier in the area, it was found that by 2022, green electricity out of the total energy sold by the supplier was about 50%.
Impact & cost	Generated renewable energy (if applicable)	157.000 MWh
	Removed/substituted energy, volume or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	60.663 tCO_2
	Total costs and costs by CO_2e unit	€ 108 million 1.780 €/tCO_2

MUNICIPAL BUILDINGS, EQUIPMENT/MUNICIPAL FACILITIES & PUBLIC LIGHTING

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
3.1 Action outline	Action name	New energy service
	Action type	Technical interventions
	Action description	The first intervention identified in the municipal sector envisages the optimisation of the management aspects related to energy consumption, through the entrusting of the management and maintenance service of the thermal power plants of municipal buildings, with related technological improvement and building and plant energy upgrading. The actions envisaged include, for example, specific interventions on building automation systems aimed at a punctual management of the temperatures inside individual rooms and high monitoring and control capabilities. In detail, from a contractual point of view, the Municipality intends to contract the energy management service through Energy Performance Contracting (EPC). This is a type of contract that provides the Municipality with guaranteed energy savings and facilitated access to third-party financing (FTT). The EPC, in fact, foresees that the ESCo (i.e. the service provider) carries out energy efficiency upgrading and improvement of facilities and buildings owned by the Municipality. The investment is borne by the ESCo, which may use its own or third-party financial means. The Municipality, for the duration of the contract, pays the ESCo a share of the energy savings generated by the efficiency measures. In this way the ESCo recovers the initial investment.
Reference to impact pathway	Field of action	Public Buildings and Public Lighting
	Systemic lever	Technology
	Outcome (according to module B-1.1)	1,500 thermal MWh of methane gas saved by 2025 3,000 thermal MWh of methane gas saved by 2027
Implementation	Responsible bodies/person for implementation	Energy Policy Office
	Action scale & addressed entities	Among the actors involved in the intervention are the Municipality, the contracting company and the users of the buildings affected by the upgrading work.
	Involved stakeholders	Contracting Company (ESCo). Users of the buildings affected by the upgrading work.

	Comments on implementation	The Municipality has already started this process by awarding the public lighting service through an EPC contract.
Impact & cost	Generated renewable energy (if applicable)	no
	Removed/substituted energy, volume or fuel type	5.445 thermal MWh of methane gas saved
	GHG emissions reduction estimate (total) per emission source sector	1.100 tCO2
	Total costs and costs by CO2e unit	€ 1,7 million

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
3.2 Action outline	Action name	Efficiency enhancement of sports facilities
	Action type	Technical interventions
	Action description	In the context of public buildings, facilities and services, specific actions for sports facilities in the Prato area have been identified within the emission reduction plan. In this case, there are plans to improve thermal consumption efficiency by replacing obsolete thermal energy production plants with more efficient systems. In particular, the targets set for 2030 include the replacement of systems used for generating thermal energy in swimming pools, gyms and serving football and rugby pitches. The gradual replacement of systems is assumed in order to favor more efficient systems, functional for different uses, aiming at electrification (e.g. replacing boilers with heat pumps). The panorama of buildings used for sports in the Municipality of Prato is varied and consists of various open-air facilities, each equipped with at least one pair of changing rooms, currently served by a gas or LPG heating plant. The number amounts to 22 buildings used for football, rugby and five-a-side football, to which must be added the 'Lungobisenzio' municipal stadium, the 'M. Ferrari' athletics track and 3 tennis courts. Other facilities for outdoor sports practice are the model car track in Iolo, the skate park area in viale Galilei and the archery field in Via Gora del Pero, all equipped with small heat production systems. The indoor sports buildings of city importance are the 'Pala Kobiliça' sports hall and the 'Palarogai' skating rink. In addition, the Municipality of Prato owns five indoor swimming facilities and the 'Colzi-Martini' swimming facility in Via Roma with outdoor pools. The new rehabilitation pool in Via Roma is under construction and the new Olympic-size pool in Iolo is being planned. Also owned by the municipal administration are eight bowling alleys, located at various points in the city in the vicinity of green areas, each generally equipped with a heating system for heating the interior rooms. The number of school gyms in which amateur or competitive sports activities are practiced is 29,

		to which must be added the 99 Via Roma Gymnasium, not directly connected to a school building, and consisting of two activity rooms and a pair of changing rooms. The Municipality will engage in the search for contributions at both regional/national and European level or may choose to finance the interventions directly.
Reference to impact pathway	Field of action	Public Buildings and Public Lighting
	Systemic lever	Technology
	Outcome (according to module B-1.1)	- about -35% on the assumed annual consumption of heat and electricity by 2025 - approximately -70% on the assumed annual consumption of heat and electricity by 2027
Implementation	Responsible bodies/person for implementation	Sports Building Office
	Action scale & addressed entities	The actors involved in the intervention include sports clubs and private citizens who use the facilities' services.
	Involved stakeholders	Municipality of Prato Sports clubs Private citizens
	Comments on implementation	/
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	1.113 thermal MWh
	GHG emissions reduction estimate (total) per emission source sector	225 tCO2
	Total costs and costs by CO2e unit	€ 1,7 million 7.555 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
3.3 Action outline	Action name	Re-lamping of lighting systems of outdoor and outdoor sports fields
	Action type	Technical interventions
	Action description	As described in Sheet 3.2, the outdoor sports facilities on the territory of the Municipality of Prato amount to 22 buildings used for football, rugby and five-a-side football, to which must be added the 'Lungobisenzio' municipal stadium, the 'M. Ferrari' athletics track and 3 tennis courts. Other facilities for outdoor sports practice are the model car track in Iolo, the skate park area in viale Galilei and the archery field in via Gora del Pero. The action envisaged in the plan, in particular, involves the gradual re-lamping of the lighting systems of outdoor sports grounds with the introduction of dimming or dimming systems.
Reference to impact pathway	Field of action	Public Buildings and Public Lighting
	Systemic lever	Technology
	Outcome (according to module B-1.1)	n.a.
Implementation	Responsible bodies/person for implementation	Sports Building Office
	Action scale & addressed entities	The actors involved in the intervention include sports clubs and private citizens who use the facilities' services
	Involved stakeholders	Municipality of Prato Sports clubs Private citizens
	Comments on implementation	The Municipality will engage in the search for contributions at both regional/national and European level or may choose to finance the interventions directly.
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	n.a. tCO2
	Total costs and costs by CO2e unit	€ 900.000 n.d €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
3.4 Action outline	Action name	Re-lamping degli impianti di illuminazione delle piscine e locali indoor
	Action type	Technical interventions
	Action description	Among the actions planned for sports facilities in the Prato area, in addition to the actions expressly focused on thermal consumption efficiency (described in the previous sheet), specific actions have also been identified to reduce electricity consumption. The European Commission established strict ecodesign requirements for light sources in the EU Ecodesign Regulation 2019/2020 (Single Lighting Regulation, SLR). In spring 2022, the EU Commission also revised the ROHS DIRECTIVE 2011/65/EU and further restricted the exemptions for the use of mercury in light sources defined in Annex III. As a result of these legal measures, the following lamp types can no longer be placed on the EU market: T5 circular fluorescent lamps from 25 February 2023; Compact fluorescent lamps with plug-in base (CFLni) as from 25 February 2023; T5 and T8 linear fluorescent lamps as from 25 August 2023; Halogen bulbs (G4, GY6.35, G9) from 1 September 2023. In this case, re-lamping of the lighting systems in the halls, gyms and swimming pools, as well as indoor premises, will be planned in line with the requirements of the regulations. The current context sees a gradual but sporadic replacement of lighting fixtures in sports venues (mainly halogen or metal halide) with LED lighting fixtures. In the complete replacement, foreseen within the scope of the action described, the lighting requirements provided for by the CONI regulations and the federal regulations of the sector, for the level of discipline practiced, must be verified, also taking into consideration - for swimming facilities - the peculiar phenomenon of reflection and refraction of light on the water surface. The interventions include the replacement of old lamps and ceilings with new high-efficiency LED

		technology light sources that guarantee adequate performance and energy savings. The Municipality will engage in the search for contributions at both regional/national and European level or may choose to finance the interventions directly.
Reference to impact pathway	Field of action	Public Buildings and Public Lighting
	Systemic lever	Technology
	Outcome (according to module B-1.1)	about -25% on the assumed annual consumption of heat and electricity in 2025 about -45% on assumed annual consumption of heat and electricity by 2027
Implementation	Responsible bodies/person for implementation	Sports Building Office
	Action scale & addressed entities	The actors involved in the intervention include sports clubs and private citizens who use the facilities' services
	Involved stakeholders	Municipality of Prato Sports clubs Private citizens
	Comments on implementation	The Municipality will engage in the search for contributions at both regional/national and European level or may choose to finance the interventions directly.
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	6.000 MWh electricity
	GHG emissions reduction estimate (total) per emission source sector	2.310 tCO_2
	Total costs and costs by CO2e unit	€ 500.000 216 €/tCO_2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
3.5.1 Action outline	Action name	Energy requalification of ordinary lighting systems serving public buildings: PALAZZO BENASSAI and PALAZZO COMUNAL
	Action type	Technical interventions
	Action description	In line with the provisions of the European regulations described in Sheet 3.3, within the emission reduction plan, a series of ordinary lighting system upgrades have been planned, including in particular ● Town Hall; ● Palazzo Gini-Benassai - which houses part of the technical offices of the municipal administration.  **Figure 7: Town Hall**  **Figure 8: Gini-Benassai Palace** In detail, for the above-mentioned buildings, it is planned to completely replace the existing lighting systems by 2026 with new high-efficiency LED technology light sources that ensure adequate performance and energy savings.
Reference to impact pathway	Field of action	Public Buildings and Public Lighting
	Systemic lever	Technology
	Outcome (according to module B-1.1)	- approximately -25% on assumed annual electricity consumption in 2025

		- approximately -45% on assumed annual electricity consumption in 2027
Implementation	Responsible bodies/person for implementation	Energy Policy Office
	Action scale & addressed entities	/
	Involved stakeholders	Municipality of Prato
	Comments on implementation	The project is in the approval phase and is expected to be fully implemented by 2024
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	82 MWh of electricity saved
	GHG emissions reduction estimate (total) per emission source sector	31,76 tCO2
	Total costs and costs by CO2e unit	€ 200.000 6.297 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
3.5.2 Action outline	Action name	Energy requalification of ordinary lighting installations serving other public buildings
	Action type	Technical interventions
	Action description	In the Prato territory, several schools, office districts and municipal buildings are still equipped with fluorescent tubes, therefore, in line with the European regulations described in Sheet 3.3, a plan has been drawn up for the progressive replacement of the current lighting fixtures with LED fixtures for the following buildings: • Municipal Offices in via Vittorio Veneto, 9; • Technical Office in via Arcivescovo Martini 60; • Civil Protection in via Lazzerini, 58; • Kindergartens; • Primary schools; • Middle schools; • High School in via F. Baldanzi; • Teaching Direction of the 2nd Circle in via Ridolfo del Ghirlandaio; • Offices Grignano - Cafaggio and in the Directorate of Education in via Montalese 247; • Neighborhoods (North, Centre, East, West-Ex Elementary); • IPAB Multiethnic Centre in via Roma; • Le Badie Multifunctional Centre in Via Righi; • Ventrone Civic Centre in via Gardenie.
Reference to impact pathway	Field of action	Public Buildings and Public Lighting
	Systemic lever	Technology
	Outcome (according to module B-1.1)	850 MWh of electricity saved in 2025 1.730 MWh of electricity saved in 2027

Implementation	Responsible bodies/person for implementation	Energy Policy Office
	Action scale & addressed entities	/
	Involved stakeholders	Municipality of Prato
	Comments on implementation	The Municipality will undertake to find the funds to finance the interventions directly, also thanks to contributions obtained at national or European level.
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	3.057 MWh of electricity saved
	GHG emissions reduction estimate (total) per emission source sector	1.177 tCO2
	Total costs and costs by CO2e unit	€ 4 million 3.398 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
3.6.1 Action outline	Action name	Redevelopment of Public Residential Housing for Housing Assistance - 1st Intervention Block
	Action type	Technical interventions
	Action description	Within the reduction plan, specific strategies were also included for Public Residential Housing. Specifically, between 2014 and 2020, a total of 498 pre-existing boilers were removed and replaced with condensing models as part of an energy improvement programme. The analysis of the impact of these replacements, defined only over the two-year period 2019-2020, shows a significant reduction in consumption. In addition, specific work was carried out at three buildings located at via del Girasole 26/1-2-3, consisting of 18 dwellings subject to Public Residential Housing regulations. These involved the dismantling and subsequent replacement of single-glazed wooden window frames with new PVC frames with high energy performance, characterized by a thermal transmittance coefficient (Uw) of at least 1.29 W/sq mK, with additional masonry work for proper installation. Similar work was carried out in three other facilities located in via del Malfante 54, 56 and 71, involving 20 dwellings subject to Public Residential Housing regulations. Here, the single-glazed wooden window frames were replaced with new energy-efficient white PVC frames, accompanied by minor masonry work for an appropriate fit. The overall effect of these actions was a significant improvement in the energy efficiency of the buildings concerned, evidenced by the advancement of the overall energy class from G to F, as assessed through energy audits. N.B. Reductions in consumption and emissions have been accounted for within the residential buildings sector.
Reference to impact pathway	Field of action	Public Buildings and Public Lighting
	Systemic lever	Technology
	Outcome (according to module B-1.1)	Completed
Implementation	Responsible bodies/person for implementation	Building Office
	Action scale & addressed entities	/
	Involved stakeholders	Municipality of Prato

	Comments on implementation	
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	617 thermal MWh saved
	GHG emissions reduction estimate (total) per emission source sector	124 tCO_2
	Total costs and costs by CO2e unit	€ 125.000 1.008 €/tCO_2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
3.6.2 Action outline	Action name	Redevelopment of Public Residential Housing for Housing Assistance (ERP) - 2nd Intervention Blocks
	Action type	Technical interventions
	Action description	Also in the context of the Public Residential Housing, further future efficiency actions are planned at the buildings located at via del Girasole 26/1-2-3 and via del Malfante 71, through an energy upgrading programme between 2022 and 2026. In both cases, similar interventions will be carried out: building insulation, roof insulation, installation of thermoregulation systems, replacement of condensing boilers and seismic upgrading with re-roofing. These interventions will allow an advancement of three energy classes, from F to C. In addition, during the period 2022-2026, significant interventions have been planned on two buildings located at via Rubieri 49-55 and via Zipoli 23/29, involving a total of 48 dwellings subject to Public Residential Housing regulations. These interventions include roof insulation, replacement of window frames, introduction of new shutters, installation of thermoregulation systems, replacement of condensing boilers, and seismic improvement works. Together, these interventions have led from energy class G to class E. At the same time, in the context of the 110% Superbonus programme, energy efficiency measures were started on two buildings located at via Capitini 1-13 and via Parini 16-18, involving 54 and 24 dwellings respectively, some of which are subject to Public Residential Housing regulations. The interventions consisted in the construction of thermal insulation, replacement of window frames, introduction of new shutters and installation of new condensing boilers. These works led to an energy improvement from energy class G to class E. Finally, an energy efficiency intervention was carried out on a building located via Rondine 16, involving 6 dwellings, one of which is subject to Public Residential Housing regulations. The intervention involved the construction of a thermal coat, bringing the building from energy class G to energy class E.

		N.B. Reductions in consumption and emissions have been accounted for within the residential buildings sector.
Reference to impact pathway	Field of action	Public Buildings and Public Lighting
	Systemic lever	Technology
	Outcome (according to module B-1.1)	Started in 2025 Realised to 2027
Implementation	Responsible bodies/person for implementation	Building Office
	Action scale & addressed entities	/
	Involved stakeholders	Municipality of Prato
	Comments on implementation	/
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	689 thermal MWh saved
	GHG emissions reduction estimate (total) per emission source sector	139 tCO2
	Total costs and costs by CO2e unit	€ 4,5 million € 32.374 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
3.7 Action outline	Action name	Photovoltaic panel installation
	Action type	Technical interventions
	Action description	As far as self-production from RES is concerned, based on the analysis of the territory's actual potential, the installation of photovoltaic panels for a total power of about 3 MWp has been planned. The Municipality is also planning to build a third photovoltaic plant at the 'Coderino' landfill, which has already undergone reclamation and safety works, with a total capacity of about 1.990 kWp. In particular, the sizing of the systems was based on the 20% coverage of energy consumption in the residential sector estimated to 2030, which also considers the increases in electricity consumption linked to electrification strategies (e.g. heat pumps and induction hobs) and the expected benefits of energy efficiency measures. According to a study carried out in the Prato area, this intervention would require the installation of panels on an area corresponding to about 4% of the total potential useful area of the public sector. The Municipality will undertake to find the funds to finance the interventions directly, also thanks to contributions obtained at national or European level.
Reference to impact pathway	Field of action	0.5 MWp installed by 2025 1 MWp installed by 2027
	Systemic lever	Energy Policy Office
	Outcome (according to module B-1.1)	
Implementation	Responsible bodies/person for implementation	Municipality of Prato Alia
	Action scale & addressed entities	0.5 MWp installed by 2025 1 MWp installed by 2027
	Involved stakeholders	Energy Policy Office
	Comments on implementation	/
Impact & cost	Generated renewable energy (if applicable)	3,600MWh electricity
	Removed/substituted energy, volume or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	1,386 tCO_2
	Total costs and costs by CO2e unit	7.5 Mln € 5,411€/tCO_2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
3.8 Action outline	Action name	Purchases of green electricity to cover the electricity needs of municipal buildings and public lighting
	Action type	Technical interventions
	Action description	As a further strategy with a view to neutralizing residual emissions from electricity consumption in the residential sector by 2030, specific action is planned on the type of supply contracts. Currently, the Municipality purchases certified green electricity for all municipal Points of Delivery except public lighting. The electricity used for street lighting is not certified green because the concession contract with a performance guarantee concluded with an ESCo at the time of signing did not provide for this service. The Municipality will enter into negotiations with the ESCo to supplement the contract and immediately provide for the purchase of certified green electricity for all public lighting utilities.
Reference to impact pathway	Field of action	Public Buildings and Public Lighting
	Systemic lever	Technology
	Outcome (according to module B-1.1)	All green energy will be purchased in the short term (1-2 years)
Implementation	Responsible bodies/person for implementation	Public Lighting Department
	Action scale & addressed entities	/
	Involved stakeholders	Municipality of Prato Estra
	Comments on implementation	To date, the Municipality purchases certified green electricity for all municipal Points of Delivery except public lighting. The electricity used for street lighting is not certified green because the concession contract with a performance guarantee concluded with an ESCo at the time of signing did not provide for this service. The Municipality will enter into negotiations with the ESCo to supplement the contract and immediately provide for the purchase of certified green electricity for all public lighting utilities.

Impact & cost	Generated renewable energy (if applicable)	7.374 MWh
	Removed/substituted energy, volume or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	2.839 tCO_2
	Total costs and costs by CO_2e unit	€ 9 million 3.170 €/tCO_2

BUILDINGS, EQUIPMENT/TERTIARY INSTALLATIONS (NON-MUNICIPAL)

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
4.1 Action outline	Action name	Replacing boilers with heat pumps in tertiary buildings
	Action type	Technical interventions
	Action description	According to the National Integrated Energy and Climate Plan (NIPEC), policies to promote energy efficiency in the tertiary sector are to be strengthened. This involves achieving a redevelopment of the existing building stock. A crucial aspect for the reduction of building-related emissions concerns the more widespread adoption of heat pumps as the primary heating system. Heat pumps represent advanced technological solutions that allow not only heating but also room air conditioning and domestic hot water production. In addition, the development of heat pumps and the electrification of other uses will potentially be fostered by the increasing spread of photovoltaic systems. This technology plays a strategic role in the air-conditioning of civil buildings in the area, as it maximizes energy efficiency and reduces environmental impact. The PNIEC emphasises the importance of this energy transition, encouraging the use of heat pumps as one of the preferred solutions for air conditioning in buildings. In this context, the action defined on the territory of Prato envisages the replacement of boilers with heat pumps in the activities operating in the tertiary sector, with the objective of involving the activities responsible for about 50% of the thermal consumption for the global heating of the sector and an expected saving of 18,828 MWh. A primary role in the implementation of this action will be played by the three new Steering Committees: Steering Committee for actions in the public service sector (State Institutions, Tuscany Region, Province of Prato, ASL Toscana Centro, University of Florence, etc.); Steering Committee for actions in the field of private services of public interest (Diocese of Prato, ETS, Third Sector, Associations, etc.); Steering Committee for private sector actions (large-scale retail trade, trade associations and services, etc.). The Municipality of Prato will encourage this action with measures such as the energy desk, information and awareness campaigns, building regulations, energy planning and bureaucratic simplification. These measures will aim to: facilitate the authorisation process obliging action to be taken before national obligations or achieving higher performance values than national ones

		make known all the possible incentives that can be accessed to finance the type of intervention concerned raising awareness among stakeholders for change
Reference to impact pathway	Field of action	Tertiary Sector
	Systemic lever	Technology
	Outcome (according to module B-1.1)	- Replacement of boilers in activities responsible for a total of at least 2,500 MWh of heat - Replacement of boilers of activities responsible for a total of at least 7,200 thermal MWh by 2027
Implementation	Responsible bodies/person for implementation	Energy Policy Office Private building office
	Action scale & addressed entities	The actors involved in the initiative are the companies in the tertiary sector, the Municipality of Prato and all the companies that will carry out the interventions. The management costs of the information retrieval measure borne by the Municipality are those related to internal staff or any outsourcing of services and the cost of modifying the data collection platform
	Involved stakeholders	Municipality of Prato Companies in the tertiary sector Control room
	Comments on implementation	The aim is to support those who carry out energy requalification works through the economic and tax incentive mechanisms of the Conto Termico and Ecobonus provided by the State. https://www2.comune.prato.it/paes/cosa/condomini-sostenibili/pagina849.html https://www2.comune.prato.it/paes/cosa/tavolo/pagina1448.html
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	18.828 thermal MWh
	GHG emissions reduction estimate (total) per emission source sector	3.803 tCO_2
	Total costs and costs by CO2e unit	€ 225 million 59.156 €/tCO_2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
4.2 Action outline	Action name	Introduction of a municipal ordinance aimed at the optimal management of air conditioning systems in tertiary activities
	Action type	Other/Governance & Policy
	Action description	In the territory of Prato, a trade union ordinance will be issued pursuant to Article 5 of Presidential Decree 74/2013 aimed at establishing restrictions on the use of air conditioning systems (heating and cooling) inside private buildings, with the objective of managing energy consumption more effectively. With regard to heating, the regulation will provide for a maximum set point temperature set at 19°C, with a tolerance of ±2°C. In addition, the operating period of the plants will be reduced by 15 days compared to the current regulations, foreseeing, for example, a delayed start-up of 8 days compared to the usual switch-on date and an earlier end of 7 days compared to the traditional switch-off date. The daily operating time of the plants will be reduced by 1 hour. This initiative is an extension of the Ministerial Decree of 6 October 2022 No. 383 (valid for the reference year 2022-2023), known as the 'National Plan for the Containment of Gas Consumption - Heating Containment Measure'. As far as cooling is concerned, the regulation stipulates a minimum temperature set point of 28 °C. According to ENEA good practices, an increase of the thermostat set point from 26 to 28 °C could result in energy savings of approximately 25% on the electricity used for cooling. The ordinance is expected to come into force in 2024. This measure aimed at regulating and optimizing the use of heating and cooling systems is part of broader strategies aimed at promoting a more responsible use of energy resources and reducing environmental impact, in accordance with the objectives of sustainability and limiting energy consumption. The Municipality of Prato will also encourage this action with measures such as energy counters and information and awareness campaigns Finally, special attention will be given to the issue of controls and sanctions, a necessary

		condition to ensure the operability of the instrument.
Reference to impact pathway	Field of action	Tertiary sector
	Systemic lever	Governance & Policy
	Outcome (according to module B-1.1)	Made
Implementation	Responsible bodies/person for implementation	Energy Policy Office Private building office
	Action scale & addressed entities	The companies in the tertiary sector are the main actors involved in this operation together with the internal staff of the Comune di Prato administration that will be involved in the drafting of the regulation and in the verifications.
	Involved stakeholders	Companies in the tertiary sector Municipality of Prato
	Comments on implementation	During the period of the energy crisis, intervention was implemented by the Italian state
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	2.069 thermal MWh 1.125 MWh electricity
	GHG emissions reduction estimate (total) per emission source sector	836,76 tCO_2
	Total costs and costs by CO_2e unit	€ 50.000 59,75€/tCO_2

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<tr><td colspan="3">B-2.2: Individual action outlines</td></tr>
<tr><td colspan="3">(fill out one sheet per intervention/project)</td></tr>
<tr><td rowspan="3">4.3 Action outline</td><td>Action name</td><td>Installation of photovoltaic panels to cover the electrical needs of the tertiary sector</td></tr>
<tr><td>Action type</td><td>Technical interventions</td></tr>
<tr><td>Action description</td><td>As far as self-production from RES is concerned, based on the analysis of the territory's actual potential, the installation of photovoltaic panels on the useful surfaces of the roofs of tertiary activities has been planned for a total power of about 57 MWp and an expected producibility of 68,380 MWh of electricity.

The sizing of the systems was based on the coverage of 20% of the residential sector's estimated energy consumption by 2030, which also takes into account increases in electricity consumption linked to electrification strategies (heat pumps) and the expected benefits of energy efficiency measures.

A primary role in the implementation of this action will be played by the three new Steering Committees:
Cabina di Regia for actions in the public service sector (State Institutions, Tuscany Region, Province of Prato, ASL Toscana Centro, University of Florence, etc.);
Cabina di Regia for actions in the field of private services of public interest (Diocese of Prato, ETS, Third Sector, Associations, etc.);
Steering committee for private sector actions (large-scale retail trade, trade and service associations, etc.).
In addition to national incentives for such interventions, the Municipality of Prato will encourage this action with measures such as the energy desk, information and awareness campaigns, building regulations, energy planning and bureaucratic simplification.

These measures will aim to:
facilitate the authorisation process
obliging action to be taken before national obligations or achieving higher performance values than national ones
make known all the possible incentives that can be accessed to finance the type of intervention concerned</td></tr>
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		• raising awareness of change among stakeholders In order to achieve the above objectives, it will be important to promote the development of Energy Communities in the municipal territory. It should be noted that the Municipality has already committed itself, with Municipal Council Resolution No. 306 of 03/10/2023, to support and promote initiatives that may lead to the development of Renewable Energy Communities with a view to a concrete and effective sustainable development at local level in implementation of Legislative Decree 199/2021 and Tuscan Regional Law 42/2022.
Reference to impact pathway	Field of action	Tertiary Sector
	Systemic lever	Technology
	Outcome (according to module B-1.1)	10 MWp installed by 2025 25 MWp installed by 2027
Implementation	Responsible bodies/person for implementation	Energy Policy Office, Private Building Office
	Action scale & addressed entities	Companies in the tertiary sector are the main actors involved in this operation.
	Involved stakeholders	Companies in the tertiary sector Municipality of Prato
	Comments on implementation	The Ministry for the Environment and Energy Security is currently defining an incentive system for energy communities. In addition, there are national incentives for the construction of photovoltaic plants in Italy through PNRR funds.
Impact & cost	Generated renewable energy (if applicable)	68,135 MWh
	Removed/substituted energy, volume or fuel type	\
	GHG emissions reduction estimate (total) per emission source sector	26.318,60 tCO2
	Total costs and costs by CO2e unit	€ 115 million 4,369 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
4.4 Action outline	Action name	Purchases of green electricity to cover the electricity needs of the tertiary sector
	Action type	Technical interventions
	Action description	As a further strategy with a view to neutralizing residual emissions related to electricity consumption in the tertiary sector by 2030, specific action is planned on the type of supply contracts. Specifically, the action envisages the purchase of certified green electricity with Guarantees of Origin (GO) to cover 80% of the sector's energy needs by 2030 for a total of 273,422 MWh of electricity. The Municipality will provide for an obligation to purchase certified green electricity for all entities that access incentive programmes for energy efficiency measures or the construction of energy production plants from renewable sources. The Municipality of Prato will also encourage this action with indirect information and awareness-raising measures such as energy desks and communication campaigns. The Municipality is committed, through dialogue with specialized operators, to assessing the feasibility of purchasing Guarantees of Origin to cover the electricity used by third parties in order to ensure the eventual achievement of the 2030 target.
Reference to impact pathway	Field of action	Tertiary Sector
	Systemic lever	Technology
	Outcome (according to module B-1.1)	-
Implementation	Responsible bodies/person for implementation	Municipality of Prato - Energy Policy Office
	Action scale & addressed entities	Companies in the tertiary sector are the main actors involved in this operation.
	Involved stakeholders	Companies in the tertiary sector Municipality of Prato
	Comments on implementation	After consulting an energy supplier in the area, it was found that by 2022, green electricity out of the total energy sold by the supplier was about 50 per cent.
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	272.542 MWh saved

	GHG emissions reduction estimate (total) per emission source sector	104.929 tCO2
	Total costs and costs by CO2e unit	130 million 1,238 €/tCO2

AGRICULTURE, FISHERIES AND FORESTRY

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
5.1 Action outline	Action name	Replacing diesel agricultural tractors with biodiesel tractors
	Action type	Technical interventions
	Action description	On farms, diesel consumption in tractors is one of the main items in terms of climate-changing gas emissions. A viable alternative, with a view to reducing the carbon footprint, is to replace diesel tractors with biodiesel tractors. Biodiesel is a biofuel, i.e. a fuel obtained from renewable sources such as vegetable oils and animal fats. Modern technologies implemented in tractors allow the use of biodiesel, which reduces greenhouse gas emissions. The INAIL notice[1] of 2023 offered a specific example of a financial incentive for tractor replacement, and it is plausible to expect a number of similar initiatives at national or regional level in the coming years. From this point of view, the action identified for the Prato area envisages that out of the total number of farms with at least one diesel tractor, 60 per cent will have replaced their tractors with biodiesel technology by 2030, reducing consumption by 5,691 MWh thermal. The action will be promoted through indirect measures by the Municipality, both through activities carried out by the Energy Desk in favour of local agricultural entrepreneurs, and through the dissemination of information on existing calls for tenders in the agricultural sector and with specific support activities for joining them. The Municipality will take steps to make the supply of biofuel easier.
Reference to impact pathway	Field of action	Agricultural Sector
	Systemic lever	Technology
	Outcome (according to module B-1.1)	90 diesel tractors replaced by 2025 120 diesel tractors replaced by 2027
Implementation	Responsible bodies/person for implementation	Municipality of Prato
	Action scale & addressed entities	The relevant actors involved in the intervention are the local farms and the Municipality of Prato.
	Involved stakeholders	Farms in the Municipality of Prato

[1] Isi 2023 notice - Agriculture

	Comments on implementation	It should be noted that farms will be able to take advantage of several incentive calls, including the INAIL national call for agriculture.
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	5,691.87 Thermal MWh
	GHG emissions reduction estimate (total) per emission source sector	1,519.7 tCO_2
	Total costs and costs by CO2e unit	11.9 Mln € 7,876.41 €/tCO_2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
5.2 Action outline	Action name	Modernisation of agricultural machinery and vehicle fleet
	Action type	Technical interventions
	Action description	The efficiency of agricultural machinery, together with the adoption of sustainable farming practices, are two other important items in the reduction of farm emissions. From this point of view, the intervention defined for agricultural enterprises operating in the Municipality of Prato aims to promote the upgrading of agricultural machinery (replacement of obsolete machinery) and to introduce precision farming techniques and Agriculture 5.0 technologies. The aim is to improve agricultural production and reduce environmental impact through the use of modern equipment and advanced practices. Possible actions include the purchase of machinery, equipment and devices aimed at ● support investments in precision agriculture; ● purchase of advanced machinery, field sensors, weather stations, data collection drones, automatic handling systems, automatically guided vehicles and flexible handling systems, with control and data transmission capabilities for remote diagnostics, remote control and monitoring of working conditions and processes; ● purchase of specific machinery and equipment to reduce the use of plant protection products and optimise the use of fertilisers; ● purchase of advanced equipment for the livestock sector, characterised by a high level of technology and automation. The intervention therefore envisages the modernisation of agricultural machinery and vehicle fleets (excluding tractors considered in action 5.1) with a view to the gradual implementation of Agriculture 5.0 practices and technologies in the main farms operating in the Prato area, which are cumulatively responsible for a total thermal consumption of at least 3,000 MWh_{th} . The action will be promoted through indirect measures by the Municipality, both through

		activities carried out by the Energy Desk in favour of local agricultural entrepreneurs, and through the dissemination of information on existing calls for tenders in the agricultural sphere, including on Agriculture 5.0, and with specific support activities for joining them.
Reference to impact pathway	Field of action	Agriculture
	Systemic lever	Technology
	Outcome (according to module B-1.1)	farms responsible for a total heat consumption of at least 500 MWh thermal by 2025 farms responsible for a total heat consumption of at least 1,250 MWh thermal by 2025
Implementation	Responsible bodies/person for implementation	Municipality of Prato
	Action scale & addressed entities	The relevant actors involved in the intervention are the local farms and the Municipality of Prato
	Involved stakeholders	Farms in the Municipality of Prato
	Comments on implementation	It should be noted that farms will be able to take advantage of several incentive calls, including the INAIL national call for agriculture.
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	2,845 MWh thermal
	GHG emissions reduction estimate (total) per emission source sector	759.9 tCO2
	Total costs and costs by CO2e unit	2.28 Mln € 3,000 €/tCO2

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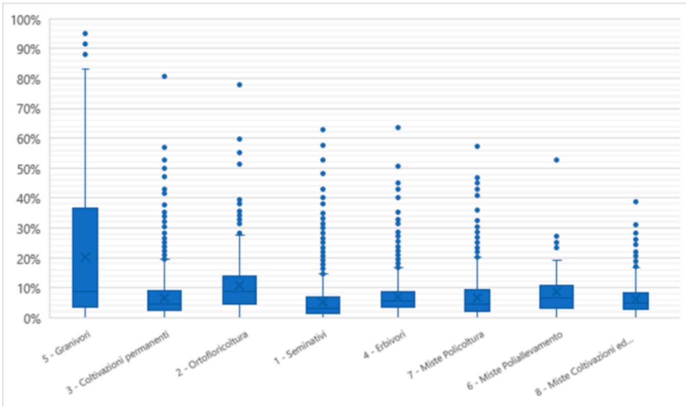
<tr><th colspan="3">B-2.2: Individual action outlines</th></tr>
<tr><td colspan="3">(fill out one sheet per intervention/project)</td></tr>
<tr><td>5.3 Action outline</td><td>Action name</td><td>Agri-voltaic installation</td></tr>
<tr><td></td><td>Action type</td><td>Technical interventions</td></tr>
<tr><td></td><td>Action description</td><td>Agro-voltaics, with its innovative fusion of solar energy production and agricultural practices, brings with it a number of concrete advantages. According to estimates made using the FADN (Agricultural Accountancy Data Network) database, the energy supply costs borne by farms across the country (including fossil fuels for fuel and combustibles) represent on average more than 20% of variable costs, with higher percentages for some production sectors, such as granivores (around 30%).

Therefore, investments dedicated to energy efficiency and the production of renewable energy for self-consumption result in lower costs that can increase, even significantly, agricultural profitability.



• Figure 9- Incidence of energy costs on total costs on farms %: Source: CREA elaborations on FADN data 2019

Furthermore, the introduction of agri-voltaics creates opportunities for shared value creation in the area. Collaboration with agronomists, agricultural enterprises and stakeholders in the sector will foster the exchange of knowledge and technology, encouraging innovation in existing agricultural practices and promoting beneficial synergies for the entire community. Another major benefit is to offer farmers an additional source of income, allowing them to reinvest in their farming activities. This will not only help increase competitiveness, but also contribute to enhancing the efficiency of local farming operations. It is important to emphasise that agri-voltaics is particularly suitable for permanent crops such as meadows and pastures, while it may not be optimal for arable land mainly dedicated to cereal and wheat crops (although specific</td></tr>
</table>

		solutions have already been studied for this type of crop as well). An agri-voltaic system must be characterised by configurations aimed at guaranteeing the continuity of the agricultural activity: this requirement can be declined in terms of 'density' In order to assess the density of the photovoltaic application with respect to the installation site, it is possible to consider indicators such as power density (MW/ha) or the percentage of the total area covered by the modules (LAOR). On the basis of a study of the actual potential of the Prato area, the installation of agri-voltaic modules was planned considering only agricultural areas related to permanent crops, permanent meadows and pastures, and excluding arable land (because it consists mainly of cereals and wheat) When dimensioning, good industry practice suggests adopting a maximum LAOR of 40 %. In our case, as a precaution, we considered a LAOR of 30 %, estimating the power density with the following formula: [MW/ha] = 0.6 (LAOR 30%, modules 350 W). Based on this assessment, the specific intervention involves the installation of 350W agri-voltaic modules for a total of about 190 MWp. This power would use about 7% of the agricultural area of the Prato territory. In addition to national incentives for such interventions, the Municipality of Prato will encourage this action with measures such as the energy desk, information and awareness campaigns, energy planning and bureaucratic simplification. These measures will aim to: ● facilitate the authorisation process ● make known all the possible incentives that can be accessed to finance the type of intervention concerned ● raising awareness among stakeholders for change In order to achieve the above objectives, it will also be important to promote the development of Energy Communities in the Municipality. It should be noted that the Municipality has already committed itself, with Municipal Council Resolution No. 306 of 03/10/2023, to support and promote initiatives that may lead to the development of Renewable Energy Communities with a view to a concrete and effective sustainable development at local level in implementation of Legislative Decree 199/2021 and Tuscan Regional Law 42/2022. N.B. Given the limited electricity requirements of the agricultural sector, the oversizing of the plant well beyond the strict sectoral needs is aimed at generating surplus

		electricity that can be used as one of the tools for offsetting residual emissions from other sectors.
Reference to impact pathway	Field of action	Agriculture
	Systemic lever	Technology
	Outcome (according to module B-1.1)	55 MWp of installed agri-voltaics by 2025 110 MWp of installed agri-voltaics by 2027
Implementation	Responsible bodies/person for implementation	Municipality of Prato
	Action scale & addressed entities	The relevant actors involved in the intervention are the farms in the area and the Municipality of Prato, which will encourage this action with indirect measures such as energy desks and awareness campaigns
	Involved stakeholders	Farms in the Municipality of Prato
	Comments on implementation	The Ministry for the Environment and Energy Security is currently defining an incentive system for energy communities. In addition, there are national incentives for the construction of photovoltaic, agri-voltaic and agrisolar plants in Italy through PNRR funds.
Impact & cost	Generated renewable energy (if applicable)	222,886 MWh
	Removed/substituted energy, volume or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	85,811 tCO2
	Total costs and costs by CO2e unit	126. € Mln 1468 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
5.4 Action outline	Action name	Purchases of green electricity to cover the electricity needs of the agricultural sector
	Action type	Technical interventions
	Action description	As a further strategy with a view to neutralising residual emissions related to the electricity consumption of the agricultural sector by 2030, specific action is planned on the type of supply contracts. Specifically, the action envisages the purchase of certified green electricity with Guarantees of Origin (GO) to cover 80% of the sector's energy needs by 2030 for a total of 2,766 MWh of electricity. The Municipality of Prato will also encourage this action with indirect information and awareness-raising measures such as energy desks and communication campaigns. The Municipality undertakes, through dialogue with specialised operators, to assess the feasibility of purchasing Guarantees of Origin to cover the electricity used by third parties in order to guarantee the eventual achievement of the 2030 target.
Reference to impact pathway	Field of action	Agricultural sector
	Systemic lever	Technology
	Outcome (according to module B-1.1)	500 MWh of electricity purchased from green energy 1,250 MWh of electricity purchased from green energy
Implementation	Responsible bodies/person for implementation	Municipality of Prato
	Action scale & addressed entities	The relevant actors involved in the intervention are the farms in the area and the Municipality of Prato, which will encourage this action with indirect measures such as energy desks and awareness campaigns
	Involved stakeholders	Farms in the Municipality of Prato
	Comments on implementation	After consulting an energy supplier in the area, it was found that already by 2022, green electricity out of the total energy sold by the supplier was about 50 per cent.
Impact & cost	Generated renewable energy (if applicable)	2,766 MWh
	Removed/substituted energy, volume or fuel type	/

	GHG emissions reduction estimate (total) per emission source sector	1,064 tCO2
	Total costs and costs by CO2e unit	1.8 Mln € 1,690 €/tCO2

MOBILITY

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
6.1 Action outline	Action name	Strengthening the local public transport system
	Action type	Physical/ spatial interventions
	Action description	One of the most important strategies envisaged to reduce the use of private vehicles within the Municipality of Prato is based on the strengthening of the local public transport (LPT) system, with the aim of increasing LPT use from the current 6% to 50% by 2030 To achieve this target, a number of specific actions have been identified: ● build the first urban tramway line Stazione c.le-Museo Pecci, capable of transporting at least 2,000 passengers per hour per direction increasing the frequency from 3 to 6 passages per hour on average on the LPT network, ● increase the number of buses from 60 to 90 during peak hours, with only electric or hydrogen-powered vehicles ● make access to the service free of charge for all users, at least for a period of time. The urban tramway and plays a strategic role in completing the metro-tramway connection between the cities of Florence and Prato along the 'Firenze Peretola-Prato Museo Pecci - Prato ex-Banci area' ridge, representing a key intervention in the framework of the development of collective mobility systems in the metropolitan area. With regard to the realisation of the integrated tramway system, the Municipality of Prato has already signed a PROGRAMME AGREEMENT FOR THE EXTENSION OF THE FIORENTINE TRAILWAY SYSTEM IN THE METROPOLITAN AREA AND THE METROPOLITAN INFRASTRUCTURAL CONNECTION

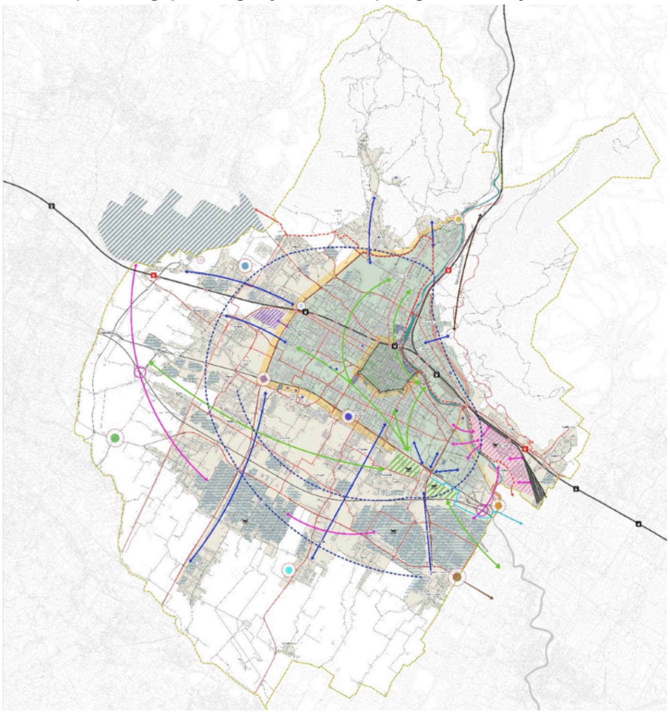
		BETWEEN THE CITIES OF FLORENCE AND PRATO, which aims to • To define a strategic reference framework concerning the guided collective mobility system in the metropolitan area, including respectively the completion of the Florentine tramway network, its metropolitan extensions and the extension of this system to the city of Prato along the strategic backbone 'Firenze Peretola - Prato Est Museo Pecci - Prato ex-Banci area'. • Define the implementation modalities of the tramway extension 3.2.1 "Piazza della Libertà - Bagno a Ripoli" financed for the amount of EUR 80 million by the 2014-2020 Development and Cohesion Fund through the reprogramming and new allocation of resources to the Region of Tuscany approved by CIPE Resolution 40/2020. • Identifying ways to start and continue projects, and defining strategies for finding the necessary financial resources within a shared priority framework. The Municipality will endeavour to find the funds to finance the interventions directly, also thanks to contributions obtained at national or European level.
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	18.2% of daily travel by LPT (91,000 daily trips by 2025 31.0% of daily travel by LPT (154,000 daily trips) to 2027
Implementation	Responsible bodies/person for implementation	Municipality Mobility Office Urban Planning Office
	Action scale & addressed entities	Citizens are the main actors involved in this operation. They are joined by the Municipality of Prato, for the purchase of electric transporter vehicles and awareness-raising activities for the use of LPT
	Involved stakeholders	Municipality of Prato Citizenship
	Comments on implementation	An agreement has been reached between the Municipality, Autolinee Toscane Spa and the Region of Tuscany for the purchase of new electric and hybrid vehicles and related infrastructure. The agreement provides for

		financing of EUR 8.5 million for the purchase of 12 hybrid and 9 electric buses by 31 December 2025.
Impact & cost	Generated renewable energy (if applicable)	Not applicable
	Removed/substituted energy, volume or fuel type	Approximately 27.5 million litres of fuel
	GHG emissions reduction estimate (total) per emission source sector	68,750 tCO_2
	Total costs and costs by CO2e unit	225 Mln € 3,272 €/tCO_2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
6.2 Action outline	Action name	Infrastructure enhancement to facilitate access to LPT
	Action type	Physical/ spatial interventions
	Action description	In order to further reduce the share of journeys by private vehicles in the most densely populated urban area (a necessary objective not only for reducing emissions but also for increasing road safety and the usability of public spaces), in addition to the strengthening of the LPT (sheet 6.1), the strategy envisages increasing the attractiveness of the main road network in such a way as to allow for greater traffic fluidity. In particular, through the enhancement of some particularly congested infrastructural nodes it is possible to considerably reduce CO_2 emissions into the atmosphere due to stationary vehicles in traffic jams, as well as to save time for users. The objective of the action is therefore to strengthen the main road network in order to limit the improper use of the local road network by reducing, within the latter, the so-called 'through traffic', i.e. that component that has crossed the dense city to reach a destination outside it. In quantitative terms, the aim is to reduce local traffic using private vehicles with internal combustion engines (car/motorbike/van), with the goal of reducing its use from the current 82% to 26% by 2030. By improving the practicability of the main road system, access to the interchange car parks for the car-LPT modal exchange is also favoured. These car parks, in fact, as provided for by the recently adopted Structural Plan, are located right on the main road system and connected to the public transport system. With regard to the main road network, the infrastructure, upgrading and safety measures included in the assumed scenario include in detail ● Completion of the Second West Ring Road (Lots 3 and 6): the intervention is aimed at giving continuity to the alternative route to the west,

		mending the relations between Nuova Montalese, Via Pistoiese and the roundabout in Viale Unione Europea; in addition, the southern section, already almost completely completed, of the second ring road between Via Ponte dei Bini and the 'Declassata' is to be opened to traffic. ● Redevelopment of the 'Declassata' (viale Leonardo da Vinci): the intervention is on the municipal, regional and national agenda thanks to the recent agreement between the parties for the development of the detailed design of the doubling of V.le Leonardo da Vinci in the area between via Nenni and via Marx (the so-called 'Soccorso' subway, see next box). To the west of the city, the 'Declassata' axis will be affected by the widening to four lanes Urban Plan of Sustainable Mobility of Prato Plan Document 41 (two in each direction) in the short stretch near the junction with the second western ring road. An intervention of a completely different calibre concerns the arrangement of the most central part of the infrastructure, near the 'Soccorso' (first aid station), with the provision of a separation of transit vehicle flows from those at destination, to be realised by means of a subway. Subway of the "Soccorso" The doubling of the "Declassata" between Via Nenni and Via Marx envisages the construction of a tunnel approximately 500 metres long with two lanes in each direction. The estimated cost of the work is approximately 60 million euro, completely financed with ministerial funds. ● Roads in the hamlets: this category includes the new road connection between the hamlets of Tobbiana and Iolo connected to the three-lane widening of the A11 motorway. ● Safety and redevelopment works: the redevelopment of the system of squares to the north of the historic centre (Piazza Mercatale, Piazza Ciardi and Piazza del Mercato Nuovo) is part of the broader strategy of enhancing and promoting the public spaces that hinge on the Serraglio station and the University. The redevelopment of the three squares, included in the Reference Scenario, is the first step in this strategy. On the road system front, the redevelopment of Via Foscolo is planned through the realignment of the road layout between the New Hospital roundabout and the Via Ciulli roundabout.

		There are also a number of interventions aimed at upgrading the road infrastructure, which include: ● SS325 - bottleneck s. Lucia. ● Tangenziale Nord-Sud - adaptation of the v.le Cervi section, via L.Rossi subway, Prato Borgonuovo railway station connection and Capezzana overpass ● Adaptation of industrial axis (via |Paronese) ● Completion of industry axis connections East (connection to Campi Bisenzio) and West (connection to second ring road) ● Completion of Via della Pace and connection to second ring road ● Completion of second ring road With regard to the interchange car parks and car parks connecting to the central area, several interventions are planned. Some of them are aimed at completing the parking offer at the attractive poles of public mobility and favouring interchange with LPT, such as ● Prato Centrale, realisation of the interchange hub for public and private mobility and inclusion of 300 parking spaces; ● Prato Borgonuovo, rearrangement of accesses to the current parking area and planned completion with approximately 130 additional parking spaces; ● Redevelopment of police headquarters car park ● Via Nenni car park ● Parking Capezzana ● Ciliani car park (western bypass) ● San Martino car park for Galceti (western bypass) ● Parking Baciacavallo (Inductive axis) ● Parking Maliseti Other interventions, on the other hand, are aimed at optimising the (main) car parks around the central area: -Piazza Ebensee, redevelopment of the routes between the car park and the city centre, with minimum hourly rates in relation to the area and incentive conditions for long-term parking (over 2 hours); -Piazza del Mercato Nuovo, redevelopment of routes, parking pricing, minimum value in relation to the area to which it belongs, but discouraging long-term parking (over 2 hours); -Piazza Mercatale, redevelopment of the square and reduction of the number of parking spaces, maximum tariff in relation to the area and discouraging long-term parking (over 2 hours). Possible experimentation with dynamic parking pricing systems according to the time of day (maximum in the morning, to be reduced in the afternoon and evening).

		In addition, parking management tools (ITS) will be optimised with the inclusion of addressing systems to the parking areas with (real time) signalling of the relative availability of parking spaces. The system will have to intercept all flows entering the urban area and will have to relate the main parking facilities subject to charging both at ground level and in structure. Introduction of parking collection and control systems, already foreseen in the reference scenario and which may be further developed as the parking pricing system is progressively extended. 

		
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	16% of daily trips by LPT (91,000 daily trips) to 2025

		31.0% of daily travel by LPT (154,000 daily trips) to 2027
Implementation	Responsible bodies/person for implementation	Municipality Mobility Office Urban Planning Office
	Action scale & addressed entities	Citizens are the main actors involved in this operation. They are joined by the Municipality of Prato, for the construction and extension of main roads
	Involved stakeholders	Municipality of Prato Citizenship Road infrastructure companies
	Comments on implementation	The Municipality will endeavour to find the funds to finance the interventions directly, also thanks to contributions obtained at national or European level. This will reduce traffic from 82 per cent (i.e. 447,273 internal private vehicle trips) to 46 per cent (i.e. down to 267,273 trips), resulting in a reduction in fuel and thus climate-changing emissions. The estimated cost for carrying out these works is approximately € 100 million. The Municipality will undertake to recover these resources from internal funds through national or European contributions
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	About 4.7 million litres of fuel
	GHG emissions reduction estimate (total) per emission source sector	11,932 tCO_2
	Total costs and costs by CO2e unit	100 Mln € 8,381 €/tCO_2

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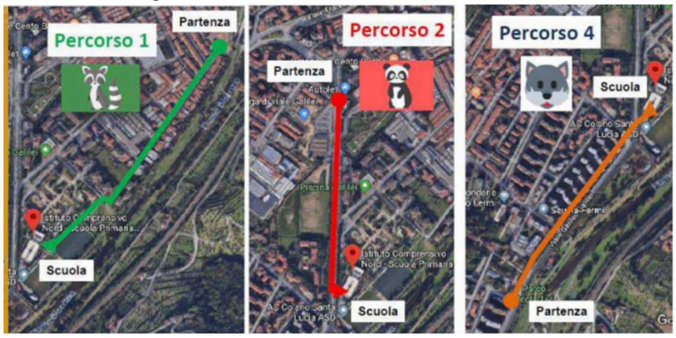
<tr><th colspan="3">B-2.2: Individual action outlines</th></tr>
<tr><td colspan="3">(fill out one sheet per intervention/project)</td></tr>
<tr><td rowspan="3">6.3 Action outline</td><td>Action name</td><td>Strengthening the pedibus and urban school transport</td></tr>
<tr><td>Action type</td><td>Physical/ spatial interventions</td></tr>
<tr><td>Action description</td><td>The Pedibus is a walking bus, a caravan of children travelling to school in groups, accompanied by two parents: a 'driver' and a 'controller' who closes the line. The Pedibus travels in sunshine and rain and everyone, accompanying adults and children, wears a high-visibility waistcoat. Like a real bus, it departs from a specific point and, following a set route, picks up passengers at designated stops along the way. The parents responsible for each individual pedibus ensure that it is started and maintained. It is currently one of the safest, most environmentally friendly and fun ways to get to school.
The initiative, promoted by the Demos project, has been very successful. To date, in fact, ten schools in Prato have taken part in this activity (Scuola Alberto Manzi, Scuola Cicognini, Scuola Italo Calvino, Scuola Cesare Guasti, Scuola Antonio Bruni, Scuola Dalla Chiesa Scuola Salvo D'Acquisto, Scuola Puddu Scuola Santa Gonda, Scuola Pizzidimonte, Scuola Meucci, Scuola Marcocci, Scuola Mandela, Scuola Iqbal, Scuola Don Milani, Scuola De Andrè, Scuola Da Vinci, Scuola Ammannati) for a total of around 1,200 students.
For each school that joined the Pedibus, 2 to 4 lines were activated:
● green line: teddy bears
● red line: panda
● blue line penguins
● orange line wolves


• **Figure: Map of currently active pedibus routes in Prato.**
As part of the action plan to reduce emissions, the service is to be expanded, with the goal of increasing pedibus trips to 5,000 per day by 2030.
The Municipality could enhance the pedibus service by providing the necessary material (e.g. high-visibility waistcoats) and improve signposting.</td></tr>
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		In addition, an expansion of urban school transport is also envisaged by means of the use of buses with the goal of increasing the number of trips per day from the current 1,600 to 5,000 by 2030. In this case, the increase in the supply of seats is linked to the purchase of electric buses for 'closed-door' services and traditional buses (as per the previous sheet) and the introduction of subsidized forms of season tickets. The Municipality will adapt the signage to make the service safer and will provide suitable personnel to manage it. The Municipality will also endeavor to find the funds to finance the interventions directly, also thanks to contributions obtained at national or European level.
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	2,800 daily trips by pedibus and urban school transport by 2025 5,600 daily trips by pedibus and urban school transport by 2027
Implementation	Responsible bodies/person for implementation	Municipality Mobility Office Urban Planning Office
	Action scale & addressed entities	Citizens are the main actors involved in this operation. They are joined by the Municipality of Prato, for the definition of citizen awareness activities for the use of LPT
	Involved stakeholders	Municipality of Prato Citizenship
	Comments on implementation	A pedibus service has already been activated. The initiative, promoted by the Demos project, has been very successful. To date, in fact, ten schools in Prato have joined this activity, with a total of about 1,200 students involved.
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	750,000 litres of fuel
	GHG emissions reduction estimate (total) per emission source sector	1,875 tCO_2
	Total costs and costs by CO_2e unit	4.2 Mln € 2,240 €/tCO_2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
6.4 Action outline	Action name	Introduction of carpooling, car sharing, bike sharing and electric scooters
	Action type	Physical/ spatial interventions
	Action description	As a further action aimed at reducing the use of private cars with internal combustion engines, the Municipality plans to introduce car pooling, car sharing, bike sharing and electric scooters with the goal of reaching 5,000 trips per day by 2030. Since 2015, the city of Prato has favoured the localisation on its territory of a free-floating car sharing service in cooperation with Florence. While there is no doubt that the reality of Prato, compared to the country's metropolitan areas, presents conditions of less attractiveness and profitability for car sharing operators, there is equally no doubt that the presence of highly relevant poles of attraction make it an area of attention and development. The presence of the Pecci Museum, the museum centre of contemporary art in Tuscany, the dynamism of Prato's production market, with the influx of national/international operators, integration with the system of the Florentine metropolitan area and proximity to the airport make it an area with a marked presence of city users and thus of potential customers/users of car sharing services integrated with long-distance collective services (HS/HC, airport, etc.). It will therefore be a matter for the Administration to solicit the market of car sharing operators, giving facilities in terms of access to the urban area and making public recharging infrastructures available; this is to highlight the Administration's clear strategy in favour of converting the carsharing fleet to electric vehicles. This is confirmed by the same choice made with respect to the fleet serving public facilities. The action also promotes the dissemination of sharing services through the support of: ● experimenting with peer-to-peer car sharing (in particular through condominium car sharing, with a preference for electric vehicles); ● technologies for the integration of the different systems, particularly with regard to the use and information of users; ● company mobility management measures that favor the replacement of company fleets.

		The levers that the Administration will be able to activate involve aspects of communication, information and training, in order to raise awareness of sustainable mobility models among the population, city users and commuters, as well as more tangible forms of facilitation, such as reserving parking capacity (blue lines), installing recharging points at the city's parking areas, access to regulated areas (see LTZ), etc. in order to reward virtuous behavior. In addition, the Municipality of Prato, in the context of sustainable mobility, has made 200 electric scooters available in free-floating mode. The circulation area in which it is possible to move is 16 square kilometres and includes the historic centre and other areas of the city. There are 24 stations (also called hub points) where it is possible to rent a scooter and they are all located at strategic points, such as railway stations and entrances to the historic center. The Municipality will enter into agreements with car sharing and bike sharing companies to implement the service in the area and may encourage the use of carpooling apps. In addition, the Municipality will provide benefits for companies that adopt carpooling, such as free permits to circulate in the LTZ.
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	1,400 daily trips through carpooling and car sharing services by 2025 2,800 daily trips via carpooling and car sharing services by 2027
Implementation	Responsible bodies/person for implementation	Municipality Mobility Office Urban Planning Office
	Action scale & addressed entities	Citizens are the main actors involved in this operation. They are joined by the Municipality of Prato, for agreements with car companies and activities to raise awareness among citizens on the use of sharing services
	Involved stakeholders	Municipality of Prato Citizenship Prato’s Companies Service Providers
	Comments on implementation	As of today, Prato’s companies that use car pooling and operate in CTZs (controlled traffic zones), can request permission for their employees to park in controlled traffic zones where the signage provides for it

Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	375,000 litres of fuel
	GHG emissions reduction estimate (total) per emission source sector	937,50 tCO2
	Total costs and costs by CO2e unit	2 Mln € 2.133 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
6.5 Action outline	Action name	Strengthening railway transport FI-PO and Valbisenzio
	Action type	Physical/ spatial interventions
	Action description	In the area of railway transport, the primary intention is to activate Memoranda of Understanding and programme agreements with Rete Ferroviaria Italiana (RFI) and the Region of Tuscany, in order to define common paths that are useful and necessary to achieve the construction of the new stops/stations identified, both on the Florence-Prato-Pistoia railway line and on the Prato-Bologna line along the Bisenzio Valley. For almost one hundred years, the Florence-Prato-Bologna line was the railway infrastructure connecting Italy in a north-south direction. Since the opening of the TAV tunnel, Florence-Bologna has undergone a downgrading in terms of service, opening up new opportunities for both regional and interregional passenger traffic and national and international freight traffic. Through the investments currently being made by RFI, in particular the construction of the high-speed station in Florence (which will make it possible to free the existing tracks at the Florence Santa Maria Novella station from TAV traffic), it will be possible to increase the frequency of the service and, through the construction of new stops, to increase its capillarity. Investments will also have to be made in the types of railway vehicles so as to streamline the service in relation to stopping, stopping and restarting times. Alongside the upgrading of the railway infrastructure, a strengthening of the rail transport service will also be necessary, which can be implemented through a series of activities, the main ones of which will be those of: ● Enhance and utilise the potential of existing railway infrastructures, such as the Florence-Prato-Pistoia line and the Prato-Bologna line, by increasing the frequency of the service (increasing the daily number of train runs), with the same railway infrastructure (without the need for infrastructure works); ● To increase the rail transport service along the Florence-Prato-Pistoia axis, both with reference to the current

		stations of Prato Centrale, Prato Porta al Serraglio and Borgonuovo, and with a view to the construction of the La Macine and Mazzone stops, intensifying the frequency of train passage in order to create a surface metro service; • To increase the rail transport service along the Prato-Bologna axis along the Bisenzio Valley, both with reference to the current stations of Prato Centrale, Vaiano, Vernio-Montepiano Cantagallo, and in view of the construction of new stops/stations including that of S. Lucia/Coiano, thus intensifying the frequency of train passage in order to create a surface metro service along the Bisenzio Valley; • Activation of memorandums of understanding and programme agreements with Trenitalia and the Region of Tuscany, in order to define useful and necessary common paths to arrive at the allocation of greater resources to increase the service along the two railway lines Florence-Prato-Pistoia and Prato-Bologna, intensifying the frequency of train passage. In view of the special location of the Florence-Prato Pistoia railway line, an activity is planned to strengthen the relationship between this railway line and the city center based on the following interventions: • Enhancement of the Prato Porta al Serraglio station as a 'new gateway' for pedestrian access to the historic center (the 'Prato Piazza Duomo' station) for those arriving by rail along the Florence-Prato-Pistoia line, exploiting the potential of the proximity between the station and Piazza del Duomo; • Enhancement of the Prato Porta al Serraglio station as a fulcrum and potential reference point between the Florence-Prato-Pistoia railway line and its users, and the urban axis with a strong characterisation of public activities that from the Fabbricone descends towards Piazza del Mercato Nuovo, the University Pole, the car park in the Serraglio structure, the Porta al Serraglio

		station, Piazza del Duomo and from there towards the entire historic center; • Encourage architectural redevelopment of the Serraglio station, also as a 'New Gateway' to the city center; • Enhancement of the central station's role as an intermodal pole between rail transport (Florence-Prato-Pistoia and Prato-Bologna) and public road transport connected to the rest of the city, as well as a priority pole connected by means of a transport infrastructure in its own/shared seat (protected bus/tramway/train lane) with the other strategic pole for Prato's mobility system, i.e. the Pecci Museum area and the former Banci (arrival point for the tramway connection between Prato and Florence Peretola currently being planned); • Redevelopment of the pedestrian and bicycle connections of the connecting axis represented by Central Station-Ponte alla Vittoria-Piazza Europa-Viale Vittorio Veneto-Piazza San Marco-Centro Storico; • Enhancement and strengthening of the role of the Borgonuovo station as an intermodal and landmark hub in the western part of the city, with expansion of the service parking area, improvement of its connection with the western ring road by creating a direct link with the latter, a reference node within the public road transport system, connection with the bicycle mobility system both eastwards towards the center and westwards beyond the ring road. The Municipality, in agreement with the Region and the Municipality of Florence and Ferrovie dello Stato, will endeavor to find the necessary resources, also by activating national and European contributions, to upgrade the necessary infrastructure.
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	2,800Daily trips by rail on the Florence-Prato line 40,000 (extra) daily journeys by rail Valbisenzio 5,600 Daily travel by rail on the Florence-Prato line 80,000 (extra) daily journeys by rail Valbisenzio

Implementation	Responsible bodies/person for implementation	Municipality Mobility Office Urban Planning Office
	Action scale & addressed entities	itizens are the main actors involved in this operation. They are joined by the Municipality of Prato, for awareness-raising activities on the use of rail transport lines and adaptation of the structure.
	Involved stakeholders	Municipality of Prato Citizenship
	Comments on implementation	This action is included in the Regional Development Plan of Tuscany, which introduces the concept of 'integrated urban areas', relating to the mobility of this integrated area, Florence, Piana and Prato, which will give a greater impetus to the realisation of a sustainable mobility model within the integrated area.
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	80,357 thermal MWh
	GHG emissions reduction estimate (total) per emission source sector	20.531 tCO2
	Total costs and costs by CO2e unit	28 Mln € 1.363 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
6.6 Action outline	Action name	PStrengthening suburban transport
	Action type	Physical/ spatial interventions
	Action description	In addition to the actions already described for urban mobility, the strategy for planning actions to reduce transport-related emissions also includes a series of actions focused on extra-urban transport. The current extra-urban lines provided by Autolinee Toscane include: • 206INDICATORE - PRATO • 207PRATO - MONTEMURLO/MONTALE/AGLIANA • 208MONTEMURLO - MONTALE AGLIANA FS - MONTALE • 209SERVIZIO CIMITERO DI MONTEMURLO • 210PRATO - MONTALBANO • 212PRATO - CAMPI BISENZIO - FIRENZE • 213FIRENZE - MONTALBANO • 214PRATO - VAL DI BISENZIO • 51PQFQUARRATA - FIRENZE In particular, one of the planned actions aims to reduce the number of daily trips by private internal combustion vehicles through the expansion of extra-urban public road transport services, with the goal of achieving a 20 per cent increase in use by 2030 (compared to current values). The other action, on the other hand, focuses on out-of-town school transport and also targets an expansion of the current service with a target of a 20 per cent increase in use by 2030. From this point of view, the Municipality of Prato undertakes to revise the agreement with Autolinee Toscane providing for additional resources, which will be recovered through internal funds and national or European contributions, in order to optimise the service with respect to the set objective. This agreement may provide for the commissioning of new buses, an increase in frequency, and possible concessions on season tickets, especially for students.
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	85,000 Daily trips by suburban transport to 2025 169,000 Daily trips by suburban transport to 2027

Implementation	Responsible bodies/person for implementation	Municipality Mobility Office Urban Planning Office
	Action scale & addressed entities	Citizens are the main actors involved in this operation. They are joined by the Municipality of Prato, for the purchase of the vehicles and the management of the service.
	Involved stakeholders	Municipality of Prato Citizenship
	Comments on implementation	By the end of the year 2022, six new extra-urban buses will be in service: four planned to boost service on the regional direttissima Prato-Florence (LAM PO-FI) line, which, starting from the city of Prato and after serving an urban area, joins the A11 motorway to Florence in the Vittorio Veneto and Porta al Prato areas; and two to boost service on Line V, which connects Prato with the Bisenzio Valley.
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	About 10 million liters of fuel
	GHG emissions reduction estimate (total) per emission source sector	23.375 tCO_2
	Total costs and costs by CO_2e unit	7,5 Mln € 320,8 €/tCO_2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
6.7 Action outline	Action name	Last Mile' initiative
	Action type	Physical/ spatial interventions
	Action description	In terms of logistics-related transport, the 'Last Mile' initiative is an important intervention included in the action plan for reducing emissions. Through this initiative, in the area of retail delivery of goods (business supply), the aim is to limit the access of vehicles used for goods transport into the city centre, thus avoiding approximately 84,000 daily trips by 2030 with internal combustion vehicles. In this context, the 'moving boxes' initiative envisages a series of strategies and actions to improve the efficiency and effectiveness of the delivery of goods from the logistics hub to the final consignee. In particular, through the introduction of 'moving boxes' of standard material and size, which can be transported both from one operator to another and from the various operators to the logistics hub in order to optimise the journeys of individual operators. A joint action is planned to introduce an obligation to use electric vehicles for logistics and a rational and sustainable management of logistics through the City Gate project. The latter envisages a preliminary monitoring for the optimisation of transport and an operational phase with a series of vans, managed by specialised companies in the sector, which will be able to provide companies in the district with a transport service for raw materials, allowing detailed tracking of the journey. To optimize logistics management, the Municipality will involve the Prato Interporto, identified as the main logistics hub for the Prato district, financing the various interventions either with its own funds or with contributions from supra-municipal bodies. By concentrating the arrival of goods at the Interporto by rail, for which work is in progress to adapt the existing tunnels to the new European gauge standards for goods transport, it is possible to organize internal storage and warehouse management through the use of vehicles and machinery that use hydrogen for their traction. The production of hydrogen can also take place within the Interport by means of an electrolysis

		plant that can transform the energy produced by the 3 MW photovoltaic plant, currently under construction, into hydrogen to be used for the 'zero impact' operation of the vehicles used in the warehouses and storage centres located in the area. N.B. The potential benefits of green hydrogen fuelled vehicles were not taken into account in the emissions calculation.
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	29% reduction in logistical trips (from 84,000 trips in 2023 to 60,000 remaining trips) 57% reduction in logistics trips (from 84,000 trips in 2023 to 47,700 remaining trips)
Implementation	Responsible bodies/person for implementation	Municipality Mobility Office Urban Planning Office
	Action scale & addressed entities	Logistics companies are the main actors involved in this operation. In addition to them, the internal staff of the administration of the Municipality of Prato will be involved in the drafting of the regulations and in the verifications through the agreement with external entities, such as Interporto, to guarantee a service for the optimisation of goods and the recharging of vehicles that will be obliged to enter the city.
	Involved stakeholders	Municipality of Prato Citizenship Interporto
	Comments on implementation	Starting from 2022, the Interporto della Toscana Centrale spa has promoted a series of innovative projects to accompany the metropolitan district and the whole of Tuscany towards new sustainable solutions in terms of logistics.
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	Approximately 10.5 million litres of fuel
	GHG emissions reduction estimate (total) per emission source sector	26,250 tCO_2
	Total costs and costs by CO2e unit	900.000 € 34.28 €/tCO_2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
6.8 Action outline	Action name	Replacement of internal combustion vehicles by electric vehicles
	Action type	Technical interventions
	Action description	The conversion of private vehicles with internal combustion engines to electric vehicles is an action strategy envisaged in the plan after all possible reduction actions aimed at disincentivizing the use of vehicles by private individuals. In particular, the action envisages by 2030 the conversion of 50 percent of local daily trips made by private cars and motorbikes (evaluated as the residual of trips by private vehicles after the implementation of the planned actions with reference to the strengthening of the LPT and improvement of urban roads) into electric vehicles. In addition, in addition to local travel within the Municipality, by 2030 it is expected that 25% of the total daily extra-urban travel carried out by private cars and motorbikes will also be converted to electric (evaluated as a residue of the actions to strengthen extra-urban transport services). The Municipality will undertake to promote and make citizens aware of sustainable mobility issues through the energy desk and various events in the area and to implement infrastructural interventions in the Prato area based on the widespread distribution of electric recharging points (detailed intervention in the next sheet).
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	Around 1,500 electric vehicles for urban and suburban travel Approximately 11,500 electric vehicles circulating in the Municipality for urban and extra-urban travel
Implementation	Responsible bodies/person for implementation	Municipality Mobility Office Urban Planning Office
	Action scale & addressed entities	Citizens are the main actors involved in this operation. They are joined by the Municipality of Prato, for the definition and management of incentive calls and awareness-raising activities, and the car companies that produce electric vehicles
	Involved stakeholders	Municipality of Prato

		Citizenship Car companies producing electric vehicles
	Comments on implementation	Today there is a nationwide incentive system that finances the purchase of environmentally friendly vehicles.
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	113.456MWh
	GHG emissions reduction estimate (total) per emission source sector	28.988 tCO2
	Total costs and costs by CO2e unit	1.12 billion € 38,908 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
6.9 Action outline	Action name	Construction of electricity columns
	Action type	Technical interventions
	Action description	In support of what is planned in terms of electrification of public and private vehicles, the plan calls for a commitment by the Municipality to set up electric recharging points throughout the territory. In particular, the action aims at the implementation of the territorial infrastructural works foreseen in the Electric Mobility Plan approved by the Municipality of Prato and present in the addresses of the Municipal Administration and foresees the evaluation of a possible adhesion to the convention with the Consorzio Energia Toscana (C.E.T.) to establish a framework agreement. The objective of this agreement will be to identify an entity responsible for the installation, ordinary and extraordinary maintenance, and long-term management of the electric infrastructure dedicated to recharging electric vehicles, making it accessible to the public. The actions will be carried out following the directives provided by the Municipality of Prato. During this transition to electrically powered vehicles, targeted measures are being implemented to guarantee the quality of urban spaces and areas of interaction, adhering to the principle that the introduction of electric vehicles should not compromise accessibility indiscriminately. The goal is to install around 4,000 electric charging stations by 2030 to cover the needs of bus modernisation and the replacement of private combustion cars with electric cars. Once a plan for charging points has been defined, the Municipality will draw up an expression of interest in which, for example, public land will be given free of charge for at least 10 years, so that operators can install the charging stations with their own resources, and the Municipality will not incur any financial outlay.
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	500 electric charging stations installed 1,500 electric charging stations installed
Implementation	Responsible bodies/person for implementation	Municipality Mobility Office Urban Planning Office

		Companies that make and operate electricity collectors
	Action scale & addressed entities	The main actor involved will be the Municipality of Prato, which will encourage this action with indirect measures such as programme agreements with companies managing the electric recharging service.
	Involved stakeholders	Municipality of Prato Citizenship
	Comments on implementation	Prato's PUMS (Plan of Urban Sustainable Mobility) already provides for the installation of electric charging stations
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	/
	Total costs and costs by CO2e unit	132 Mln €

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
6.10 Action outline	Action name	Modernisation of the municipal fleet
	Action type	Technical Interventions
	Action description	In the context of the residual internal combustion vehicle electrification strategy to 2030, a specific action on the municipal car fleet was also planned. The intervention envisages a gradual replacement of internal combustion vehicles, with the aim of achieving total conversion to electric power of the entire fleet by 2030. The costs of the intervention will be borne either by internal municipal resources or by taking advantage of supra-municipal incentives.
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	15% replacement of municipal fleet by 2025 40% replacement of the municipal fleet by 2027
Implementation	Responsible bodies/person for implementation	Provisioning Office
	Action scale & addressed entities	The main stakeholder will be the Municipality of Prato
	Involved stakeholders	Municipality of Prato Citizenship
	Comments on implementation	/
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	464 MWh thermal
	GHG emissions reduction estimate (total) per emission source sector	118 tCO2
	Total costs and costs by CO2e unit	5 Mln € 42,372 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
6.11 Action outline	Action name	Increasing soft mobility by expanding and upgrading the city's cycle network and incentivising the purchase of bicycles.
	Action type	Technical interventions
	Action description	The issue of cycling, as indicated in the PUMS, requires specific treatment in Prato that goes beyond the current view of bicycle use for recreation to establish itself as a mode of transport for everyday mobility. The low modal share of cycling in the city is certainly not consistent with the orographic characteristics and size of the Prato territory. It will therefore be a matter of identifying and completing a bicycle and pedestrian network that makes it convenient in terms of relations served, travel time, comfort and safety to travel by bicycle not only for those who live-work in the city centre, but also for those who reach the poles of attraction of city mobility (places of work and study, public services, etc.) from the hamlets. Alongside the definition of the network scheme, the PUMS is called upon to upgrade existing relations, to recognise the integration between the urban network and the supra-local network on which the Region of Tuscany is committing itself with specific funding. Finally, in addition to the bicycle and bicycle-pedestrian network, the PUMS includes interventions on the front of the development of services and the integration of cycling with other modes of transport: from bicycle stations to the diffusion of bicycle parking points in the vicinity of poles of mobility attraction (public services, banks, shops, etc.). It should be borne in mind that the scarcity of bicycle parking points has been reported as a critical issue by the local community itself (online survey), and that at the same time these are measures that can be implemented in the short term, are certainly low-cost and characterize the commitment of the public administration. The framework of interventions related to cycling is, already in the Reference Scenario (SR) shown in the figure below, very articulated. At present the bicycle network in Prato extends for about 60 km, mainly along nature or leisure routes (along the Bisenzio river, Fosso di Iolo, etc.). The planned linear and punctual interventions, summarized in the table below, concern: ● Bicycle network - The interventions are distributed in different parts of the

municipal territory and mainly concern the strengthening of connections between the centre and the hamlets. In particular, the routes along Via Firenze, Via Ferrucci, Via Roma, Via Galcianese and Via Strozzi-Montalese are included in the Reference Scenario;

- Punctual infrastructures for cycling - This is a cycle-pedestrian footbridge to cross the Bisenzio river at Alcali (Interporto).

CICLABILITÀ	SCEN.	PERIODO
RETE CICLABILE (AREA URBANA)		
Pista ciclabile via Firenze	SR	B
Pista ciclabile via Ferrucci (tratto via Valentini - viale Repubblica)	SR	B
Via Roma	SR	B
Via Galcianese (tratto via S. Giusto - via S. Paolo)	SR	B
Via Giordano - tratto di via Pistoiese	SR	B
Via Strozzi - via Montalese (fino alla Tangenziale Ovest)	SR	B
Recupero e manutenzione straordinaria tratti esistenti (ciclabili Binda, Girardendo, via Ferraris, Bartali, Coppi) e installazione segnaletica informativa	SR	B
INFRASTRUTTURE PUNTUALI PER LA CICLABILITÀ		
Passerella ciclopedonale in località Alcali (zona interporto)	SR	M

Note: B=Breve periodo; M=Medio periodo; L=Lungo periodo

Figure: Details of the cycle networks and related infrastructure planned on the Prato territory.

In addition, it is envisaged that services to cycle mobility will be realised through the construction of:

- A velostation near the Prato Centrale station as part of the reorganisation of the integrated public and private mobility hub;
- An equipped and safe bicycle parking area at the Prato Borgonuovo station to ensure rail-bike integration within the closest station and service to the new hospital in Prato. The intervention integrates and completes the bicycle connection between the hospital and the railway station.
- Installation of racks at urban mobility hubs (schools, social and health services, shopping, leisure and sports facilities, etc.).
- The Municipality will strive to promote the purchase of bicycles through communication and awareness-raising, collaborating with national initiatives such as the bicycle bonus, considering offering a subsidy of up to Euro 800 per bicycle for up to 10,000 bicycles.
- Furthermore, through the energy desk and various events in the area, the Municipality will promote and raise awareness of sustainable mobility issues among citizens.

Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	3,000 bicycles financed by 2025 6,000 bicycles financed to 2027
Implementation	Responsible bodies/person for implementation	Municipality Mobility Office
	Action scale & addressed entities	The main stakeholder will be the Municipality of Prato
	Involved stakeholders	Municipality of Prato Citizenship
	Comments on implementation	/
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	20,569 thermal MWh
	GHG emissions reduction estimate (total) per emission source sector	5,245 tCO_2
	Total costs and costs by CO2e unit	€ 108 Mln 20,591 €/tCO_2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
6.12 Action outline	Action name	Hub Prato
	Action type	Technical interventions
	Action description	On the source of local public transport, the SUMP scenario proposes interventions of particular relevance to the transport offer aimed at integrating the urban and extra-urban dimensions of public mobility services and networks. Public mobility hub at Prato Centrale Hub of public (road-rail) and private mobility to be realised through the reorganisation of the Prato Centrale interchange. The proposed intervention envisages the use of part (about 20 thousand m^2) of the areas no longer used by the freight yard located near the main station. The presence of the Interporto and the interconnection with the railway line have led to an evident weakening of the functions of the central Prato railway yard, leaving a substantial part of areas adjacent to the consolidated city unused, with evident effects of abandonment and degradation. At the same time, the city, due to its demographic size and vocation in the territorial context, has an urgent need to reorganise its public mobility nodes, giving dignity and value to the urban landscape while optimising vehicle flows to and from the station. This option also finds a point of attention and confirmation in the interest manifested within the POR-FESR Regione Toscana 2014-2020, which identifies in the sustainable mobility interventions actions aimed at the realisation and/or enhancement of interchange systems between different modes of movement and their equipment (such as car park-exchangers, velostations, parking areas, etc.). ROP-ERDF Tuscany 2014-2020 ● Specific Objective: Increase sustainable mobility in urban areas ● Creation of infrastructures and interchange nodes aimed at increasing collective mobility and the environmentally friendly distribution of goods and related transport systems. The new Prato 'hub' will have to perform functions: o supporting public mobility: transit and parking of urban and suburban LPT services, bus station (ticketing, information, service to transit users, etc.); o parking area for private vehicles (300 parking spaces), of which 10% are equipped with electric charging stations and 5% near the exits to be allocated to persons with mobility difficulties and 10%,

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also near the exits, to be used as 'pink parking spaces';
velostation with cycle workshop function, etc;
offices for the management of the bike and car sharing service;
complementary (including commercial) activities.

The realization of the public transport hub will allow the station square to be freed from the parking of both public and private vehicles, reorganizing the spaces in such a way as to maintain the proximity of the station:

1.a stop for the embarkation and disembarkation of passengers of public transport services; - a limited number of parking spaces for kiss and ride;
2.the taxi rank;
3.parking spaces for the car sharing service;
4.bike sharing service stations. An outline and dimensioning of the public transport hub is given below

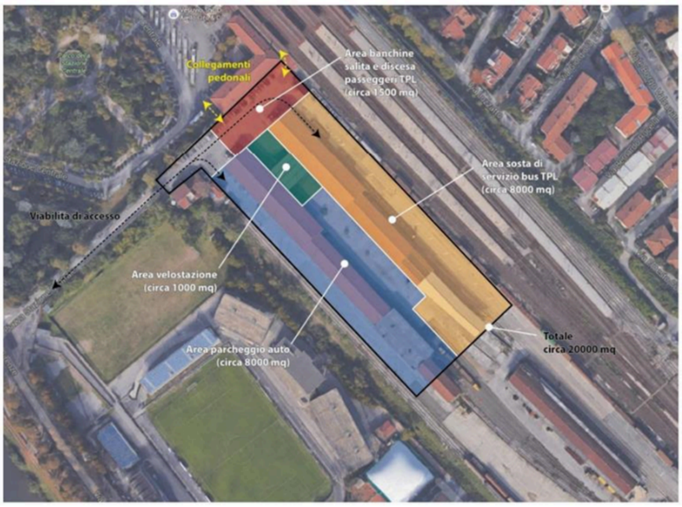

Figure- Prato HUB, project being implemented
</td></tr>
<tr><td>Reference to impact pathway</td><td>Field of action</td><td>Mobility & Transport</td></tr>
<tr><td></td><td>Systemic lever</td><td>Technology/Infrastructure</td></tr>
<tr><td></td><td>Outcome (according to module B-1.1)</td><td>Started in 2025
Realised to 2027</td></tr>
<tr><td>Implementation</td><td>Responsible bodies/person for implementation</td><td>Municipality Mobility Office</td></tr>
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	Action scale & addressed entities	The main stakeholder will be the Municipality of Prato
	Involved stakeholders	Municipality of Prato Citizenship
	Comments on implementation	/
Impact & cost	Generated renewable energy (if applicable)	/
	Removed/substituted energy, volume or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	/
	Total costs and costs by CO2e unit	/

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
6.13 Action outline	Action name	Installation of photovoltaic panels for the electricity needs of the mobility sector
	Action type	Technical interventions
	Action description	With regard to self-production from RES related to the mobility sector, a detailed analysis was conducted based on the evaluation of the actual potential of the Prato territory. The analysis revealed an actual potential for the installation of photovoltaic systems on suitable surfaces of mobility-related facilities, in particular car parks and stations, with the goal of achieving a total capacity of about 6 MWp. This strategy not only aims to provide a renewable energy source for the mobility sector, but also contributes to optimising the use of existing and future infrastructure by integrating sustainable solutions into urban development projects. The decision to install photovoltaic panels on these facilities underlines the commitment to a more sustainable energy transition and mobility. Some examples of potential areas identified for the installation of modules include: ● Public area in Via Leonardo da Vinci with disused textile company that can be converted for photovoltaic production, totalling about 69,000 m2 available; ● Exchange car park in the Museum's forecourt, with the potential to install photovoltaic shelters on approximately 6,000 m2; ● Exchange car park in Via Eugenio Barsanti, with potential for installation of photovoltaic shelters on approximately 1,050 m2; ● Interchange car park in Via Udine, with the potential to install photovoltaic shelters on approximately 2,000 m2; ● Autolinee Toscane depot in Via del Lazzaretto 70, with an availability of approximately 15,000 m2 of open area and 2,300 m2 of shed (net of the photovoltaic system already installed). In addition, it is planned to extend this initiative to the new car parks that are being planned.
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Technology/Infrastructure

	Outcome (according to module B-1.1)	2 MWp installed by 2025 4 MWp installed by 2027
Implementation	Responsible bodies/person for implementation	Municipality Mobility Office Urban Planning Office
	Action scale & addressed entities	The main actor involved is the Municipality of Prato, which will encourage this action with indirect measures such as the energy desk, energy annex, energy planning and bureaucratic simplification. The Municipality will also promote the establishment of energy communities in the area.
	Involved stakeholders	Municipality of Prato Citizenship
	Comments on implementation	The Ministry for the Environment and Energy Security is currently defining an incentive system for energy communities. In addition, there are national incentives for the construction of photovoltaic plants in Italy through funds provided by the NRRP.
Impact & cost	Generated renewable energy (if applicable)	7,200 MWh
	Removed/substituted energy, volume or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	2,772 tCO2
	Total costs and costs by CO2e unit	15 Mln€ 5,411 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
6.14 Action outline	Action name	Green electricity purchases for the electricity needs of the mobility sector
	Action type	Technical interventions
	Action description	As a further strategy with a view to neutralising residual emissions related to electricity consumption in the mobility sector by 2030, specific action is planned on the type of supply contracts. In particular, the action provides for the purchase of certified green electricity with Guarantees of Origin (GO) to cover 80 per cent of the energy needs of the mobility sector, for a total of about 55,000 MWh. The Municipality of Prato will incentivise the implementation of this action through agreements with the companies that will provide the electric vehicle recharging service by supplying certified green energy to customers and accounting to the Municipality for the energy sold to customers. It will also encourage this action with indirect information and awareness-raising measures such as energy counters and communication campaigns. The Municipality undertakes, through dialogue with specialised operators, to assess the feasibility of purchasing Guarantees of Origin to cover the electricity used by third parties in order to guarantee the eventual achievement of the 2030 target.
Reference to impact pathway	Field of action	Mobility & Transport
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	5,000 MWh of purchases from green energy 19,000 MWh of purchases from green energy
Implementation	Responsible bodies/person for implementation	Municipality Mobility Office Urban Planning Office
	Action scale & addressed entities	The main actor involved will be the Municipality of Prato will encourage this action with indirect measures such as programme agreements with the companies managing the electric recharging service. The concession will include an obligation on the part of the concessionaire to supply customers only with green energy.
	Involved stakeholders	Municipality of Prato Citizenship
	Comments on implementation	After consulting an energy supplier in the area, it was found that by 2022, green electricity out of the total energy sold by the supplier was about 50 per cent.

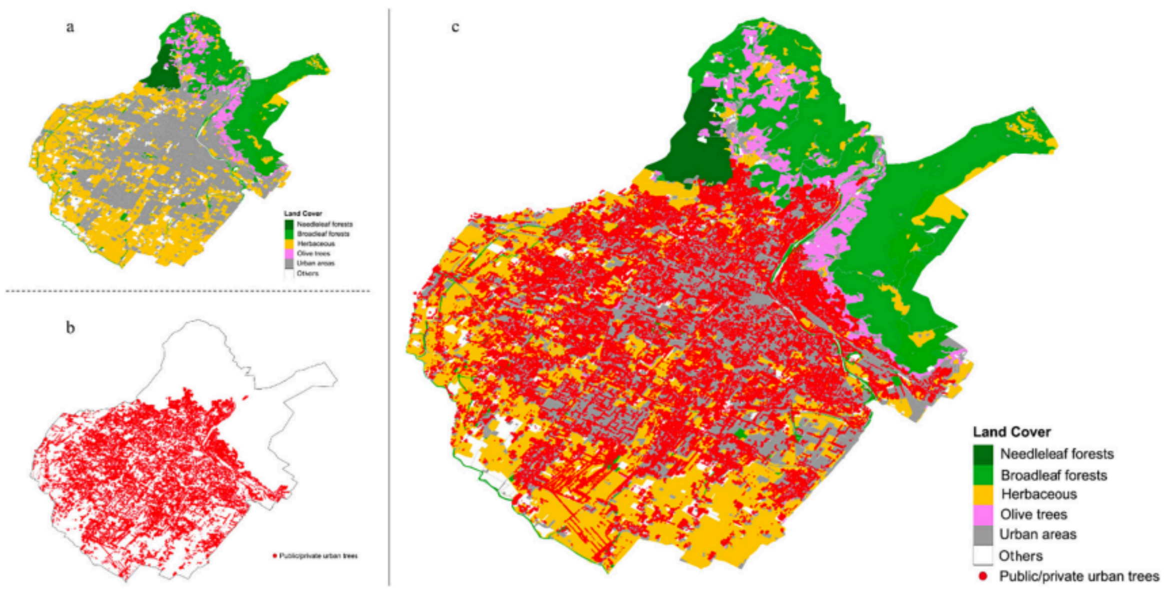
Impact & cost	Generated renewable energy (if applicable)	55.260 MWh
	Removed/substituted energy, volume or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	21.275 tCO_2
	Total costs and costs by CO_2e unit	28 Mln € 1.316 €/tCO_2

WASTE

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
7.1 Action outline	Action name	Installation of photovoltaic panels for waste electrical needs
	Action type	Technical interventions
	Action description	Based on the information gathered by the two groups, photovoltaic panels with a total capacity of around 1.5 MWp are expected to be installed by 2030, with an expected output of around 1,800 MWh. In the short term, two photovoltaic plants will be built by Alia S.p.A. on the Texile Hub plant (a new plant for the recovery of textile fractions located in the Municipality of Prato in Via di Baciacavallo) and on the roofs of the new TM Paronese plant in Via Paronese 110. The expected production of these plants will be about 750,000 kWh. The Municipality of Prato will encourage the implementation of these actions by talking with the two companies in order to sign a series of agreements to maximise the installable photovoltaic power.
Reference to impact pathway	Field of action	Waste
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	0.5 MWp to 2025 1 MWp to 2027
Implementation	Responsible bodies/person for implementation	Municipality Office Urban Planning Office Agreements with investee companies
	Action scale & addressed entities	/
	Involved stakeholders	Municipality of Prato Citizenship Alia S.p.A G.I.D.A.
	Comments on implementation	/
Impact & cost	Generated renewable energy (if applicable)	1.800
	Removed/substituted energy, volume or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	693 tCO2
	Total costs and costs by CO2e unit	3,7 Mln € 5.339 €/tCO2

B-2.2: Individual action outlines		
(fill out one sheet per intervention/project)		
7.2 Action outline	Action name	Purchases of green electricity for the electricity needs of the waste sector
	Action type	Technical interventions
	Action description	Certified green electricity with Guarantees of Origin (GO) is expected to meet all energy consumption in the waste sector by 2030. This would mean a commitment by the two companies Alia S.p.A. and G.I.D.A. to purchase certified green energy. In order to encourage the implementation of this action, the Municipality of Prato will realise agreements with the two investee companies. The agreements will have to provide for the use of certified green energy for all the facilities and installations managed by the two companies in the Prato territory and the reporting to the Municipality of the green electricity used.
Reference to impact pathway	Field of action	Waste
	Systemic lever	Technology/Infrastructure
	Outcome (according to module B-1.1)	10,000 MWh of green energy purchased 20,000 MWh of green energy purchased
Implementation	Responsible bodies/person for implementation	Municipality Office Urban Planning Office Agreements with investee companies
	Action scale & addressed entities	
	Involved stakeholders	Municipality of Prato Citizenship Alia S.p.A G.I.D.A.
	Comments on implementation	After consulting an energy supplier in the area, it was found that by 2022, green electricity out of the total energy sold by the supplier was about 50 per cent.
Impact & cost	Generated renewable energy (if applicable)	31.900 MWh
	Removed/substituted energy, volume or fuel type	/
	GHG emissions reduction estimate (total) per emission source sector	12.282 tCO_2
	Total costs and costs by CO2e unit	18 Mln € 977 €/tCO_2

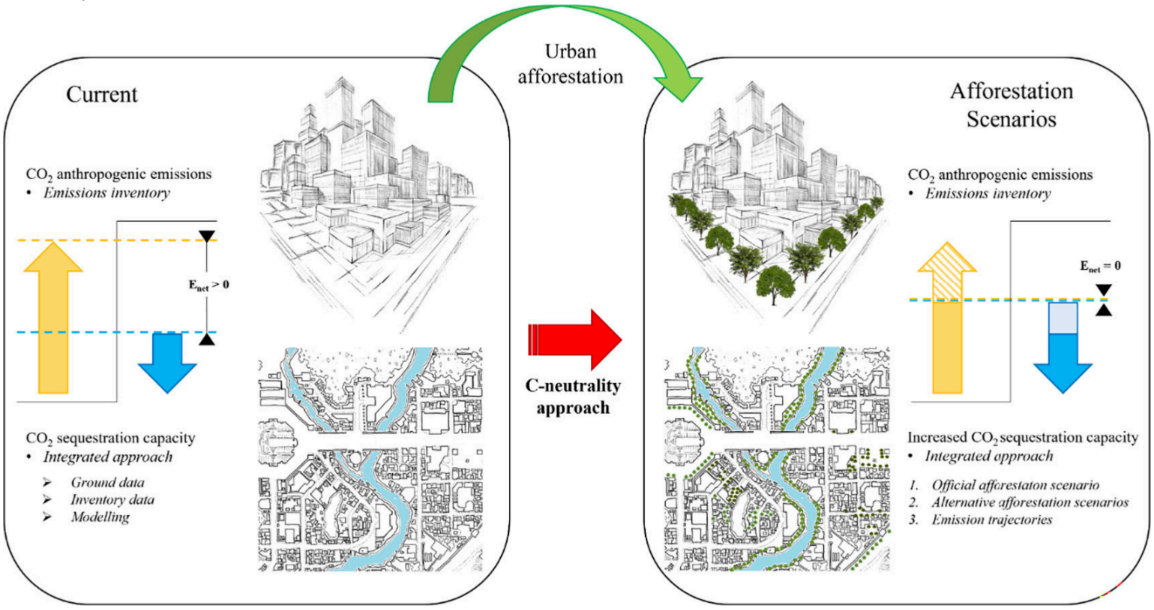
B-2.3: Summary strategy for residual emissions
A land use (LU) analysis of the Municipality was performed based on available 2016 data extracted from the land use map of the Tuscany region. This database included 44 classes that were used to identify the type and extent of forest areas present within the Municipality. All the classes surveyed were aggregated into six main classes: broadleaf forests, needle forests, olive groves and herbaceous areas, the latter including meadows and annual herbaceous crops. The fifth class consisted of urban areas and the sixth of all the other classes (e.g. cemeteries, greenhouses, sports areas, etc.) An additional layer containing information on both public and private trees located in the urban area of Prato was developed by coupling a georeferenced inventory of urban trees (UTI) owned by the Municipality with the photographic interpretation of the distribution of private trees (Fig. 2b), in order to have a realistic number of urban trees within the Municipality, excluding extra-urban forest areas. High spatial resolution aerial images (20 cm) from GEOscope,[2]



Land use classification of the Municipality of Prato according to seven classes: needle forests (light green); broadleaf forests (dark green); herbaceous areas (yellow); olive groves (pink); urban areas (grey). Other areas (white) included cemeteries, greenhouses

[2] **Source: Tuscany Region's open-source geoportal (http://www502.regione.toscana.it/geoscopio/fototeca.html), were used for photographic interpretation.**

Based on the study carried out by the CNR (National Council for Research), the Prato area offers the possibility of planting around 190,000 trees with an annual absorption of 33,000 tCO_2 by 2030.
For the reduction of residual emissions, the Municipality of Prato, assuming it can realise all 190,000 trees, will foresee a series of interventions in the existing and projected public green areas, identified by the Operational Plan, also implementing the strategies of the Urban Forestation Action Plan, owned by the Municipal Administration.



It should be noted that the Municipality has already made provision within the Urban Forestation Plan, adopted in 2018, for the planting of approximately 1,500 trees/year, on public and private areas, through specific calls for tenders and private resources.
Planting activities include:
- Direct planting in municipally owned areas
- Plantations in areas owned by other public bodies, with whom to develop special agreements
- Planting in municipal areas promoted by private funding
- Planting in private areas with private funding

In particular, the urban forestation intervention in Santo Stefano Park envisages the creation of a mixed tree and shrub stand through the transformation of an area with an extension of about 3.5 ha, located in a peri-urban area near the New Hospital of Prato - Santo Stefano.
The project stems from the desire of the area's owner to provide the health facility with a green space appropriate to the importance and function of the site. The area identified covers two areas, one adjacent to the Santo Stefano Hospital and one belonging to the Municipality of Prato. This area is considered at high risk of flooding, with a return time of less than 30 years, as demonstrated by the flooding event of the Vella torrent on 4/5 October 2010.
In addition to contributing to the mitigation of heat islands and increasing biodiversity, the intervention will have a significant visual impact on the landscape. This intervention will transform the landscape of this portion of the city's peri-urban belt, characterised by the contrast between densely urbanised and cultivated areas.
The total cost of the action is €22,050,000.00 net of the costs of processing and preparing the land .

3.3 Module B-3 Indicators for Monitoring, Evaluation and Learning

Module B-3 "Indicators for Monitoring, Evaluation and Learning" should contain a selection of indicators taken from the Comprehensive Indicator Sets developed by NZC. The following should be provided: An overview table listing the indicators selected per outcome and impact including targets and evaluation points (B-3.1); and a metadata table for each indicator selected, as specified in the Comprehensive Indicator Sets (B-3.2).

B-3.1: Impact Pathways						
Outcomes/ impacts addressed	Action/ project	**Indicator No.** (unique identified)	Indicator name	Target values		
				2025	2027	2030
reduced tCO2 in the residential building sector	**1. Residential buildings**	IN.1	tCO2/inhabitants	0,30	0,60	1,06
Private condominiums undergoing energy requalification	1.1 Energy requalification of private residential buildings	IN.1.1	No. of private condominiums upgraded	450	900	1650
Boilers replaced with heat pumps	1.2 Replacing boilers with heat pumps	IN.1.2	No. of boilers replaced	5.000	15.000	30.000
Gas hobs replaced by induction hobs	1.3 Replacing gas hobs with induction hobs	IN.1.3	No. of gas hobs replaced	10.000	30.000	78.000
Obsolete appliances replaced for low-income households	1.4 Replacing an obsolete household appliance for low-income households	IN.1.4	No. of obsolete appliances replaced	1.000	3.000	7.800
Fluorescent lamps replaced with LED lamps	1.5 Replacing fluorescent lamps with LED lamps in residential buildings	IN.1.5	No. of fluorescent lamps replaced	10.000	27.000	60.000
Introduction of municipal regulations for the optimal management of heating systems	1.6 Introduction of a permanent municipal ordinance for the optimal management of air conditioning	IN.1.6	Realised or not realised	initiated	made	made

	systems in residential buildings					
Installed power from photovoltaic panels on residential buildings	1.7 Photovoltaic panel installation on residential buildings	IN.1.7	MW of installed capacity from photovoltaic panels on residential buildings	10 MWp	27 MWp	58 MWp
Green Energy Purchases with Guarantees of Origin in the Residential Sector	1.8 Purchases of green electricity to cover residential electricity needs	IN.1.8	MWh of purchases from green energy	50,000 MWh	130,000 MWh	275,104 MWh
Reduced tCO2 in the Industrial sector	**1. Industrial Sector**	IN.2	tCO2/inhabitants	0,32	0,64	1,11
Reduced tCO2 in the Industrial sector	**2. Industrial Sector**	IN.2.a	tCO2/manufacturing activities	1,30	2,70	4,72
Power installed by photovoltaic panels on buildings in the industrial district	2.1 Ecological transition of the industrial district (Macrolotto 1, Macrolotto 2 and Artisan Areas)	IN 2.1	MWp of installed power from photovoltaic panels in the industrial district	34 MWp	69 MWp	119 MWp
Production from RES under the two-year ministerial call for energy efficiency.	2.2 Production from RES in other industrial areas.	IN. 2.2	MWp of installed capacity from photovoltaic panels in other industrial areas	3 MWp	6 MWp	10 MWp
Financed textile district projects related to efficiency actions in terms of electricity and thermal energy consumption	2.3 Energy efficiency of textile district companies	IN. 2.3	No. of funded projects	85	170	300
Textile district companies involved in Net Zero initiatives to reduce thermal and electrical consumption	2.4 Textile District's adherence to specific programmes in line with Net Zero initiatives to reduce thermal and electrical	IN. 2.4	Total thermal and electrical MWh of the companies involved	50,000 MWh thermal e 25,000 MWh electricity	135,000 MWh thermal and 60,000 MWh electrical	322,000 thermal MWh and 138,000 electrical MWh

	consumption excluding RES					
Realisation of feasibility studies for the realisation of Positive Energy District	2.5 "Positive Energy District' at consortium level	IN. 2.5	Realised/ initiated/ not realised	initiated	made	made
Green Energy Purchases with Guarantees of Origin in Industry	2.6 Green electricity purchases in the industrial sector	IN.2.6	MWh of purchases from green energy	50,000 MWh	100,000 MWh	157,000 MWh
Reduced tCO2 in the municipal sector	**3.Municipal buildings, equipment/facilities Municipal Public Lighting**	IN.3	tCO2/inhabitants	0,03	0,06	0,10
Savings in thermal consumption due to technological improvements and building and plant energy upgrading	3.1 New Energy Service	IN.3.1	Thermal MWh of methane gas saved	1,500 MWh	3,000 MWh	5,445 MWh
Electrical and thermal energy saved through the replacement of old **thermal energy** production systems with more efficient systems in **sports facilities**	3.2 Efficiency enhancement of sports facilities	IN.3.2	% reduction in thermal energy consumption	-35% on consumption	-70% on consumption	Maximum efficiency
Electricity saved as a result of efficiency enhancement/re-lamping of **lighting** systems in outdoor **sports fields.**	3.3 Re-lamping of lighting systems of outdoor and outdoor sports fields	IN. 3.3	MWh electricity saved	Not defined	Not defined	Not defined
Electricity saved as a result of **lighting** in **swimming pools and indoor spaces**	3.4 Re-lamping of swimming pool and indoor lighting systems	IN. 3.4	% reduction in electricity consumption	-25% on consumption	-45% on consumption	Maximum efficiency-
Electricity saved as a result of the energy upgrading of ordinary lighting installations	3.5.1 Energy requalification of ordinary lighting systems serving public buildings:	IN.3.5.1	% reduction in electricity consumption	-25% on consumption	-45% on consumption	in 2026 complete replacement

serving public buildings	Palazzo Benassai and Palazzo Comunale					
Electricity saved as a result of the energy upgrading of ordinary lighting installations serving public buildings	3.5.2 Energy requalification of ordinary lighting installations serving other public buildings	IN.3.5.2	MWh electricity saved	850 MWh electricity	1,730 MWh electricity	3,057 MWh electricity
Electricity saved as a result of external envelope upgrades on municipal buildings	3.6.1 Redevelopment of Public Residential Housing (ERP) carried out	IN.3.6.1	No. of boilers replaced	made	made	made
Electricity saved as a result of external envelope upgrades on municipal buildings	3.6.2 Redevelopment of Planned Public Residential Housing (ERP)	IN.3.6.2	Realised/started/ not realised	initiated	made	made
Installation of photovoltaic systems in the public sector	3.7 Installation of photovoltaic systems	IN.3.7	MWp of installed photovoltaic capacity	0.5 MWp	1 MWp	3 MWp
Green Energy Procurement with Guarantees of Origin in the Public Sector	3.8 Purchases of green electricity to cover the energy needs of municipal buildings and public lighting	IN.3.8	MWh of purchases from green energy	7400 MWh	made	made
Reduced tCO2 in the tertiary sector	**4.Tertiary (non-municipal) buildings, equipment/facilities**	IN.4	tCO2/inhabitants	0,20	0,40	0,69
Reduced tCO2 in the tertiary sector	**4.Tertiary (non-municipal) buildings, equipment/facilities**	IN.4.a	tCO2 reduced in the tertiary sector/number of employees in the tertiary sector	0,90	1,80	2,63
Thermal savings from replacing boilers with heat pumps	4.1 Replacing boilers with heat pumps in tertiary buildings	IN.4.1	Total thermal MWh for heating	2,500 MWh	7.200 MWh	18.828 MWh
Introduction of a municipal	4.2	IN.4.2	Realised/started/ not realised	made	made	made

ordinance aimed at the optimal management of heating systems in **tertiary activities**	Introduction of a municipal ordinance aimed at the optimal management of heating systems in tertiary activities					
Installation of photovoltaic systems in the tertiary sector	4.3 Installation of photovoltaic panels to cover the electrical needs of the tertiary sector	IN.4.3	MWp of installed photovoltaic capacity	10 MWp	25 MWp	57 MWp
Green Energy Purchases with Guarantees of Origin in the Tertiary Sector	4.4 Purchases of green electricity to cover the electricity needs of the tertiary sector	IN.4.4	MWh of purchases from green energy	40,000 MWh	110,000 MWh	273,422 MWh
Reduced tCO2 in the agricultural sector	**5. Agriculture, Fisheries and Forestry**	IN. 5	tCO2/agricultural activities	95,00	175,00	319,55
Diesel agricultural tractors replaced by biodiesel tractors	5.1 Replacing diesel agricultural tractors with biodiesel tractors	IN.5.1	No. of diesel tractors replaced	90	120	170
Replacement of agricultural machinery and vehicle fleet with conversion of obsolete vehicles to more efficient ones	5.2 Modernisation of agricultural machinery and vehicle fleet	IN. 5.2	Reduced total thermal MWh	500 MWh	1,250 MWh	2845 MWh
Installation of photovoltaic systems in the agricultural sector	5.3 Agrivoltaic	IN.5.3	MWp of installed agri-voltaic capacity	55 MWp	110 MWp	185 MWp
Green Energy Purchases with Guarantees of Origin in the Agricultural Sector	5.4 Purchases of green electricity to cover the electricity needs of the agricultural sector	IN.5.4	MWh of green electricity purchased	500 MWh	1,250 MWh	2,766 MWh

reduced tCO2 in the transport sector	**6.Transport**	IN.6	tCO2/inhabitants	0,30	0,70	1,09
Increase % LPT utilisation	6.1 Strengthening the local public transport system	IN.6.1	% of daily trips by LPT	18,2%	31%	50%
Reduction in % of trips by private vehicles with internal combustion engine compared to baseline	6.2 Infrastructure enhancement to facilitate access to LPT	IN.6.2	% reduction in travel by private means	16%	31%	48%
Daily trips by pedibus and urban school transport	6.3 Strengthening the pedibus and enhancing urban school transport	IN. 6.3	No. Daily trips by pedibus and urban school transport	2.800	5.600	10.000
Daily travel by car pooling and car sharing services	6.4 Introduction of car pooling, car sharing, bike sharing and electric scooters	IN.6.4	No. Daily trips via car pooling, car sharing and bike sharing services	1.400	2.800	5.000
Daily travel by train FI-PO and Valbisenzio	6.5 Strengthening railway transport FI-PO and Valbisenzio	IN. 6.5	No. Daily journeys by rail FI-PO and Valbisenzio	42.800	85.600	150.000
Daily journeys by suburban bus and suburban school transport	6.6 Enhancing suburban transport	IN. 6.6	No. Daily journeys by suburban transport	85.000	169.000	305.000
Reduction in % of journeys for logistics as a result of the 'Last Mile' initiative	6.7 Last Mile' initiative	IN. 6.7	% reduction in travel for logistics	29%	57%	100%
Internal combustion cars replaced by electric cars	6.8 Replacement of internal combustion vehicles by electric vehicles	IN. 6.8	No. of electric vehicles for local/extra-urban travel	About 1,500	About 11,500	About 42,000
Electricity columns installed	6.9 Construction of electricity columns	IN. 6.9	No. of installed electricity columns	500	1.500	4.000

Municipal fleet cars	6.10 Modernisation of the municipal fleet	IN. 6.10	% municipal fleet replacement	15%	40%	100%
Soft mobility	6.11 Increasing soft mobility by expanding and improving the city's cycle network and incentivising the purchase of bicycles.	IN. 6.11	No. of bicycles financed and total km of cycle routes constructed	3,000 bicycles Undefined km	6,000 bicycles Undefine d km	10,000 bicycles Undefined km
Interventions to integrate urban and suburban dimensions of public mobility services and networks	6.12 Hub Prato	IN. 6.12	Realised/started/ not realised	Started	Made	Made
Installation of photovoltaic systems in the transport sector	6.13 Installation of photovoltaic panels for the electricity needs of the mobility sector	IN.6.13	MWp of installed photovoltaic capacity	2 MWp	4 MWp	6 MWp
Green Energy Procurement with Guarantees of Origin in the Transport Sector	6.14 Green electricity purchases for the electricity needs of the mobility sector	IN.6.14	MWh of purchases from green electricity	5,000 MWh	19,000 MWh	55,260 MWh
	7.Waste	IN.7	tCO2/inhabitants			
Installation of photovoltaic systems in the waste sector	7.1 Installation of photovoltaic panels for waste electrical needs	IN.7.1	MWp installed by photovoltaic systems	0.5 MWp	1 MWp	1.5 MWp
Green Energy Purchases with Guarantees of Origin in the Waste Sector	7.2 Purchases of green electricity for the electricity needs of the waste sector	IN.7.2	MWh of green energy purchased	8,000 MWh	16,000 MWh	31,900 MWh

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.1** tCO2/inhabitants
Indicator Unit	tCO2/inhabitants
Definition	Ratio of tonnes of CO2 related to the residential sector divided by the total number of inhabitants of the Municipality of Prato
Calculation	We want to relate the tonnes of CO2 related to the residential sector divided by the total number of inhabitants of the Municipality of Prato
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Thermal and electrical consumption of Residential Buildings and related CO2 emissions
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the Residential Buildings sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• Source Istat for the demographic trend of the inhabitants of the Municipality of Prato; • CO2 emissions for the residential sector calculated from consumption data collected by: municipal electricity distributor 'e-distribuzione S.p.A.'; municipal natural gas distributor 'Toscana Energia'; oil bulletin of the Ministry of Economic Development.
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	

Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the residential sector, as a result of the implementation of the actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC (Sustainable Energy and Climate Action Plan)

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.1.1** No. of private condominiums upgraded
Indicator Unit	Number of private apartment buildings undergoing energy upgrading
Definition	The aim is to monitor the number of private apartment buildings that will undergo a complete energy upgrading of private buildings (building envelope+installations)
Calculation	The indicator is calculated from the applications received by the Municipality to start energy upgrading work (e.g. CILA, CILAS,...)
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Thermal consumption of residential buildings
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the Residential Buildings sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Requests received by the Municipality to carry out energy upgrading works (CILA, CILAS,...)
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the progress of building upgrades in the residential sector in order to reduce emissions from thermal consumption
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.1.2** No. of boilers replaced
Indicator Unit	Number of gas boilers replaced by heat pumps in residential buildings
Definition	We want to monitor the number of gas boilers being replaced by heat pumps in residential buildings
Calculation	The indicator is calculated from the data received from ENEA that the Municipality will request and from any data that the Municipality may retrieve from the authorisation titles
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Thermal consumption of residential buildings
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the Residential Buildings sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Data received from ENEA (National Agency for New Technologies, Energy and Sustainable Economic Development) that the Municipality will request and from any data that the Municipality may retrieve from the authorisation titles.
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the progress of the replacement of gas boilers with heat pumps in the residential sector in order to promote electrification of consumption and reduce emissions from heat consumption
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**N.1.3 No.** of gas hobs replaced

Indicator Unit	Number of gas hobs replaced with induction hobs of energy class at least A+
Definition	The aim is to monitor the number of Number of replacements of gas hobs with induction hobs of energy class at least A+ in residential buildings
Calculation	The indicator is calculated from the applications received by the Municipality to take advantage of the funds provided by the municipal call for tenders to encourage replacement
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Thermal consumption of residential buildings
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the Residential Buildings sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Applications received by the Municipality to benefit from the funds provided by the municipal call for tenders to incentivise replacement work
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the progress of the replacement of gas cookers with induction hobs in the residential sector in order to promote electrification of consumption and reduce emissions from thermal consumption
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**N.1.4 No.** of obsolete appliances replaced
Indicator Unit	Number of obsolete appliances replaced in low-income households
Definition	The aim is to monitor the number of replacements of an obsolete household appliance (chosen from ovens, fridges, dishwashers and washing machines) with a household of at least A+ class

Calculation	The indicator is calculated from the applications received by the Municipality to take advantage of the funds provided by the municipal call for tenders to encourage replacement
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electrical consumption of residential buildings
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the Residential Buildings sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Applications received by the Municipality benefit from the funds provided by the municipal call for tenders to incentivise replacement work
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the progress of the replacement of obsolete household appliances in the residential sector in order to reduce electricity consumption in the residential sector
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**No. 1.5** No. fluorescent lamps replaced
Indicator Unit	Number of fluorescent lamps replaced by LED lamps in residential buildings
Definition	We want to monitor the number of replacements of fluorescent lamps with LED lamps in residential buildings
Calculation	The indicator is calculated from the applications received by the Municipality to benefit from the funds provided by the municipal call for tenders to encourage replacement
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes

If yes, which emission source sectors does it impact?	Electrical consumption of residential buildings
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the Residential Buildings sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Applications received by the Municipality to take advantage of the funds provided by the municipal call for tenders to incentivise replacement work
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the progress of the replacement of fluorescent lamps with LED lamps in the residential sector in order to reduce electricity consumption
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**N.1.6 Realised** not realised (municipal ordinance)
Indicator Unit	Implementation of the municipal ordinance for the optimal management of air conditioning systems in residential buildings
Definition	The implementation of the municipal ordinance on the optimal management of air conditioning systems in residential buildings is to be monitored
Calculation	The action is considered to have been implemented as of the implementation and entry into force of the ordinance
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electrical/heat consumption of residential buildings
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes

If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the Residential Buildings sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Implementation of the Municipal Regulations
Expected availability	Source Municipality of Prato
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the implementation of the municipal regulation aimed at the optimal management of heating systems in residential buildings
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.1.7** MW installed capacity from photovoltaic panels
Indicator Unit	MWp installed by photovoltaic panels to cover the electricity needs of residential buildings
Definition	The aim is to monitor the installed capacity in MW of photovoltaic panels to cover the residual needs of residential buildings, and considering the surplus resulting from electrification measures
Calculation	Total installed MWp
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electricity consumption
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions related to electricity consumption in residential buildings
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• MWp installed in the Municipality of Prato Source Atlaimpianti GSE • Requests from the Municipality to the energy distributor

Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the power of photovoltaic systems built in the Municipality of Prato to cover the electricity needs of the residential sector, in order to ensure the use of renewable energy
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.1.8** MWh of purchases from green electricity
Indicator Unit	MWh of purchased green electricity certified with Guarantees of Origin (GO) to cover residential electricity needs
Definition	You want to monitor the amount of purchased green electricity certified with Guarantees of Origin (GO) to cover residential electricity needs
Calculation	Total amount of green electricity purchased with Guarantees of Origin (GO)
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electricity consumption
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions related to electricity consumption in residential buildings
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• MWh of green energy covered by GO purchased and consumed in the Municipality of Prato • Source Municipality of Prato and GSE/GME or Arera suppliers
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the amount of green energy purchased with Guarantees of Origin (GO) to cover the electricity needs of the residential sector

Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.2** tCO2/inhabitants
Indicator Unit	tCO2/inhabitants
Definition	Ratio of tonnes of CO2 related to the industrial sector divided by the total number of inhabitants of the Municipality of Prato
Calculation	We want to relate the tonnes of CO2 related to the industrial sector divided by the total number of inhabitants of the Municipality of Prato
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Thermal and electrical consumption in the industrial sector and related CO2 emissions
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to Reduce Emissions in the Industrial Sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• municipal electricity distributor 'e-distribuzione S.p.A.'. • municipal methane distributor 'Toscana Energia • oil bulletin of the Ministry of Economic Development
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the industrial sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.2.a** tCO2/manufacturing employees
Indicator Unit	tCO2/manufacturing activities

Definition	Ratio of tonnes of CO_2 related to the industrial sector divided by the total number of employees in the local units of manufacturing activities in the Municipality of Prato
Calculation	This is the ratio of the tonnes of CO_2 related to the industrial sector divided by the total number of employees in the local units of manufacturing activities in the Municipality of Prato (45 712.77 average value of employees as of 2019)
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Thermal and electrical consumption of the industrial sector and related CO_2 emissions
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to Reduce Emissions in the Industrial Sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• municipal electricity distributor 'e-distribuzione S.p.A.'. • municipal methane distributor 'Toscana Energia • oil bulletin of the Ministry of Economic Development • Istat for the number of manufacturing activities in the territory
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the industrial sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.2.1** MW of installed PV power in the areas of Industrial Macrolotto 1, Macrolotto 2 and Artisan Areas

Indicator Unit	MWp installed by photovoltaic panels to cover the electricity needs of the industrial sector in the areas of Industrial Macrolotto 1, Macrolotto 2 and Artisan Areas
Definition	The aim is to monitor the installed capacity in MW of photovoltaic panels to cover the needs of the industrial sector for the district companies in the Industrial Macrolotto 1, Macrolotto 2 and Artisan Areas
Calculation	Total installed MWp
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Industrial sector electricity consumption and related CO2 emissions
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to Reduce Emissions in the Industrial Sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• Prato Municipal Structural Plan • Study University of Rome 'La Sapienza'
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the power of photovoltaic plants built in the industrial districts of Industrial Macrolotto 1, Macrolotto 2 and Artisan Areas, to cover the electricity needs of the industrial sector, in order to ensure the use of renewable energy
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.2.2** MW of installed capacity from photovoltaics in companies in the textile district
Indicator Unit	MWp installed by photovoltaic panels to cover the electricity needs of the industrial sector in other industrial areas in the Prato area
Definition	Production from RES under the two-year ministerial call for energy efficiency.
Calculation	The indicator is calculated from the MWp of photovoltaics installed in the textile sector

Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electricity consumption in the industrial sector
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to Reduce Emissions in the Industrial Sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Allocated funds from the municipal call for tenders to encourage companies in the textile district to install photovoltaics
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the power of photovoltaic plants built in other industrial areas in the Prato territory
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.2.3** Number of textile district projects financed
Indicator Unit	Number of textile district projects financed, related to efficiency actions in terms of electricity and thermal energy consumption
Definition	The aim is to monitor funded textile district projects related to efficiency actions in terms of electricity and thermal energy consumption
Calculation	The indicator is calculated starting from the companies assigned funds by the specific municipal notice for the financing of energy efficiency measures aimed at reducing electricity consumption and thermal consumption, in addition to the ministerial notice prepared for the Prato textile district (DM 5/8/22),
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electricity and heat consumption in the industrial sector

Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to Reduce Emissions in the Industrial Sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Allocated funds from the municipal call for tenders to incentivise companies in the textile district to carry out electrical and thermal consumption efficiency measures
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the number of funded projects in the textile district for electrical and thermal consumption efficiency measures
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.2.4** Total thermal MWh of companies involved in Net Zero initiatives Total MWh of electricity of companies involved in Net Zero initiatives
Indicator Unit	Total thermal MWh of companies involved in Net Zero initiatives Total MWh of electricity of companies involved in Net Zero initiatives
Definition	The aim is to monitor the overall heat and electricity consumption of large companies and energy-intensive enterprises in the textile district involved in specific programmes in line with Net Zero initiatives.
Calculation	The indicators are calculated as the sum of the thermal consumption and the sum of the electrical consumption reported by the companies awarded funding under the programme.
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Thermal and electrical consumption in the industrial sector

Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to Reduce Emissions in the Industrial Sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Data in the sustainability reports/reports/reports produced for Net Zero programmes, published by the companies awarded the grants. The companies awarded the programme grant will be obliged to report annually to the Municipality the energy and emission savings achieved.
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicators monitor the progress of the overall thermal and electrical consumption of the companies in the textile district that will carry out Net zero interventions
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.2.5** Realised/started/not realised
Indicator Unit	Realisation of feasibility studies for the realisation of Positive Energy District
Definition	Feasibility studies with the aim of assessing the potential and necessary actions to realise 'Positive Energy District' at consortium level.
Calculation	The indicator is calculated according to the level of progress of the activity in three possible scenarios; started, realised and not realised.
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electricity consumption in the industrial sector
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes

If yes, which NZC impact pathway is it relevant for?	Actions to Reduce Emissions in the Industrial Sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Municipal regulations for monitoring activities at consortia level
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the progress of feasibility studies for the realisation of the 'Positive Energy District'.
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.2.6** MWh of purchases from green energy
Indicator Unit	MWh of green energy purchased with Guarantees of Origin (GO) to cover the electricity needs of the industrial sector
Definition	You want to monitor the amount of green energy purchased with Guarantees of Origin (GO) to cover the electricity needs of the industrial sector
Calculation	Total amount of green energy purchased with Guarantees of Origin (GO)
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electricity consumption
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions related to electricity consumption
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Municipality of Prato GSE/GME or Arera suppliers
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030

References	
Deliverables describing the indicator	The indicator monitors the amount of green energy purchased with Guarantees of Origin (GO) to cover the electricity needs of the industrial sector
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.3** tCO2 reduced in the public sector/inhabitants
Indicator Unit	tCO2reduced in the public sector/n. inhabitants
Definition	Ratio of tonnes of CO2 related to the public sector divided by the total number of inhabitants of the Municipality of Prato
Calculation	This is the ratio of tonnes of CO2 related to the public sector divided by the total number of inhabitants of the Municipality of Prato
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Thermal and electrical consumption of the public sector and related CO2 emissions
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the public sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• municipal electricity distributor 'e-distribuzione S.p.A.'. • municipal methane distributor 'Toscana Energia • oil bulletin of the Ministry of Economic Development • Energy Manager of the Municipality of Prato • Competent offices
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the public sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.3.1** Thermal MWh of methane gas saved
Indicator Unit	Thermal MWh of methane gas saved
Definition	Savings in thermal consumption due to technological improvements and building and plant energy upgrading
Calculation	Entrusting the management and maintenance service of the **thermal** power plants of **municipal buildings** with technological improvement and building and plant energy upgrading.
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Thermal and electrical consumption of the public sector and related CO2 emissions
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the public sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• Energy Manager of the Municipality of Prato • Competent offices
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the public sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.3.2** % reduction in thermal energy consumption
Indicator Unit	% reduction in thermal energy consumption in sports facilities

Definition	Thermal energy saved through the replacement of old **thermal energy** production systems with more efficient systems in **sports facilities**
Calculation	Replacement of old **thermal energy** production systems with more efficient systems in **sports facilities**
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Public sector thermal consumption and related CO2 emissions
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the public sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• Energy Manager of the Municipality of Prato • Competent offices
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the public sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.3.3** MWh electricity saved
Indicator Unit	MWh electricity saved on outdoor sports fields
Definition	Electricity saved as a result of efficiency enhancement/re-lamping of **lighting** systems on outdoor **sports fields**
Calculation	Efficiency enhancement / re-lamping of **lighting** systems of outdoor **sports fields.**
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Public sector electricity consumption and related CO2 emissions
Does the indicator measure indirect impacts (i.e. co- benefits)?	no

If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the public sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• Energy Manager of the Municipality of Prato • Competent offices
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the public sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.3.4** % reduction in electricity consumption
Indicator Unit	% reduction in electricity consumption in swimming pools and indoor premises
Definition	Electricity saved as a result of **lighting** in **swimming pools and indoor spaces**
Calculation	Efficiency enhancement / re-lamping of **lighting** systems in **swimming pools and indoor rooms**
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Public sector electricity consumption and related CO2 emissions
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the public sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• Energy Manager of the Municipality of Prato • Competent offices
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030

References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the public sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.3.5.1** % reduction in electricity consumption
Indicator Unit	% reduction in electricity consumption of public buildings: Palazzo Benassai and Palazzo Comunale
Definition	Electricity saved following energy upgrading of ordinary lighting installations serving public buildings: Palazzo Benassai and Palazzo Comunale
Calculation	Reduction of electricity consumption in the public buildings of Palazzo Benassai and Palazzo Comunale as a result of energy-efficient upgrading of lighting systems.
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Public sector electricity consumption and related CO_2 emissions
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the public sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• Energy Manager of the Municipality of Prato • Competent offices
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the progress in terms of reduction of electricity consumption in the public buildings of Palazzo Benassai and Palazzo Comunale following the energy upgrading of the lighting systems (as a result of the implementation of the actions in the Climate Neutrality Plan).
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.3.5.2** MWh electricity saved
Indicator Unit	MWh electricity saved
Definition	Electricity saved as a result of the energy upgrading of ordinary lighting installations serving other public buildings
Calculation	Calculation of electrical MWh saved as a result of energy upgrades to ordinary lighting installations serving other public buildings
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Public sector electricity consumption and related CO2 emissions
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the public sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• Energy Manager of the Municipality of Prato • Competent offices
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the public sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.3.6.1** No. of boilers replaced
Indicator Unit	Number of efficiency measures carried out Number of gas boilers replaced with heat pumps in residential buildings through measures already carried out
Definition	The aim is to monitor the number of efficiency interventions carried out and the number of boilers replaced with condensing boilers in Public Residential Housing (ERP) through interventions already implemented

Calculation	Number of efficiency measures carried out Number of boilers replaced as a result of measures already carried out through Public Residential Energy Housing (ERP) strategies.
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Thermal and electrical consumption of the public sector and related CO2 emissions
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the public sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• Energy Manager of the Municipality of Prato • Competent offices
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the progress of the implementation of boiler replacement interventions in Public Residential Housing (ERP), as a consequence of the implementation of the actions foreseen by the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.3.6.2** initiated/implemented/not implemented
Indicator Unit	Implementation of further efficiency measures in Public Residential Buildings (ERP)
Definition	Implementation of further energy efficiency and energy upgrading measures in Public Residential Buildings (ERP) through an energy upgrading programme
Calculation	The indicator is calculated according to the level of progress of the activity in three possible scenarios; started, realised and not realised.
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Thermal and electrical consumption of the public sector and related CO2 emissions

Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the public sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• Energy Manager of the Municipality of Prato • Competent offices
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the progress of energy efficiency and energy upgrading interventions in Public Residential Buildings
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.3.7** MW installed capacity from photovoltaic panels
Indicator Unit	MWp installed by photovoltaic panels to cover the electricity needs of the public sector
Definition	The aim is to monitor the installed capacity in MW of photovoltaic panels to cover the residual needs of the public sector and considering the surplus resulting from electrification measures
Calculation	Total installed MWp of the public sector
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electricity consumption
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce public sector emissions related to electricity consumption
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	

Expected data source	• MWp installed in the Municipality of Prato Source Atlaimpianti GSE • Requests from the Municipality to the energy distributor
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the power of photovoltaic systems built in the Municipality of Prato to cover the electricity needs of the public sector, in order to ensure the use of renewable energy
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.3.8** MWh of purchases from green electricity
Indicator Unit	MWh of green electricity purchased with Guarantees of Origin (GO) to cover the energy needs of the public sector
Definition	You want to monitor the amount of green electricity purchased with Guarantees of Origin (GO) to cover the energy needs of the public sector
Calculation	Total amount of green energy purchased with Guarantees of Origin (GO)
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electricity consumption
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce public sector emissions related to electricity consumption
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Municipality of Prato GSE/GME or Arera suppliers
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	

Deliverables describing the indicator	The indicator monitors the amount of green energy purchased with Guarantees of Origin (GO) to cover electricity needs in the public sector
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.4.** tCO2 reduced in the tertiary sector/n. inhabitants
Indicator Unit	tCO2/inhabitants
Definition	Ratio of tonnes of CO2 related to the public sector divided by the total number of inhabitants of the Municipality of Prato
Calculation	We want to relate the tonnes of CO2 related to the tertiary sector divided by the total number of inhabitants of the Municipality of Prato
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Tertiary sector heat and electricity consumption and related CO2 emissions
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the tertiary sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• - municipal electricity distributor 'e-distribuzione S.p.A.'; • - municipal natural gas distributor 'Toscana Energia'; • - oil bulletin of the Ministry of Economic Development.
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the tertiary sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.4.a** tCO2 reduced in the tertiary sector/employees in the tertiary sector
Indicator Unit	tCO2/inhabitants
Definition	Ratio of tonnes of CO2 related to the public sector divided by the total number of inhabitants of the Municipality of Prato
Calculation	This is the ratio of the tonnes of CO2 related to the tertiary sector divided by the total number of employees in the local units of tertiary sector activities in the Municipality of Prato (51,448.31 average value of employees as of 2019)
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Tertiary sector heat and electricity consumption and related CO2 emissions
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the tertiary sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• - municipal electricity distributor 'e-distribuzione S.p.A.'; • - municipal natural gas distributor 'Toscana Energia'; • - oil bulletin of the Ministry of Economic Development.
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the tertiary sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	IN.4.1 Total thermal MWh for heating
Indicator Unit	Total heating MWh reduced by replacing boilers with heat pumps
Definition	Total heating MWh reduced by replacing boilers with heat pumps
Calculation	We want to monitor the total heating MWh reduced by replacing boilers with heat pumps
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Tertiary sector thermal consumption and related CO2 emissions
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the tertiary sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• Enea thermal consumption data and Municipality data
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the tertiary sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.4.2** Realised/ initiated/ not realised
Indicator Unit	Introduction of a municipal ordinance
Definition	Introduction of a municipal ordinance aimed at the optimal management of air conditioning systems in **tertiary activities**

Calculation	The indicator is calculated according to the level of progress of the activity in three possible scenarios; started, realised and not realised.
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Tertiary sector thermal consumption
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the tertiary sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	no
Data requirements	
Expected data source	Municipal regulations for monitoring activities.
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	-
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.4.3** MW installed capacity from photovoltaic panels
Indicator Unit	MWp installed by photovoltaic panels to cover the electricity needs of the tertiary sector
Definition	The aim is to monitor the installed capacity in MW of photovoltaic panels to cover the residual needs of the tertiary sector, and considering the surplus resulting from electrification measures
Calculation	Total MWp installed for the tertiary sector
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electricity consumption
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes

If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions related to electricity consumption
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• MWp installed in the Municipality of Prato Source Atlaimpianti GSE • Requests from the Municipality to the energy distributor
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the power of photovoltaic systems built in the Municipality of Prato to cover the electricity needs of the tertiary sector, in order to ensure the use of renewable energy
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.4.4** MWh of purchases from green electricity
Indicator Unit	MWh of green energy purchased with Guarantees of Origin (GO) to cover the needs of the tertiary sector
Definition	You want to monitor the amount of green energy purchased with Guarantees of Origin (GO) to cover the needs of the tertiary sector
Calculation	Total amount of green energy purchased with Guarantees of Origin (GO)
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electricity consumption
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions related to electricity consumption
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Municipality of Prato GSE/GME or Arera suppliers

Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the amount of green energy purchased with Guarantees of Origin (GO) to cover the electricity needs of the tertiary sector
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.5** Reduced tCO2 in agricultural activities
Indicator Unit	tCO2/agricultural activities
Definition	Ratio of tonnes of CO2 related to the agricultural sector divided by the total number of activities involved
Calculation	We want to relate the tonnes of CO2 related to the agricultural sector divided by the total number of activities within the Municipality of Prato (279 enterprises as of 2019).
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Diesel consumption
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the agricultural sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• Tuscany Region Business Register Data • Istat data • Municipality data • Ministry data

	• Energy distributor data
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the agricultural sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.5.1** Replaced diesel tractors
Indicator Unit	No. of diesel tractors replaced
Definition	60% replacement of diesel agricultural tractors with biodiesel tractors
Calculation	Number of tractors replaced by farms
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Diesel consumption
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the agricultural sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data	INAIL data

source	ISTAT data Tuscany Region Business Register Data
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the agricultural sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.5.2** Reduced thermal MWh through modernisation of agricultural machinery and vehicle fleet
Indicator Unit	Reduced thermal MWh through modernisation of agricultural machinery and vehicle fleet
Definition	Replacement of agricultural machinery and vehicle fleet with conversion of obsolete vehicles to more efficient ones
Calculation	Modernisation of agricultural machinery and vehicle fleet with conversion of obsolete vehicles to more efficient ones.
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Diesel consumption
Does the indicator measure indirect impacts (i.e. co- benefits)?	no

If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the agricultural sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	The indicator is calculated from the number of replacement interventions registered by the Municipality of Prato within the Calls for Proposals INAIL data ISTAT data
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the agricultural sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.5.3** MW installed capacity of agrovoltaic modules
Indicator Unit	MWp installed of agri-voltaic modules to cover the electricity needs of the agricultural sector
Definition	The aim is to monitor the installed capacity in MW of photovoltaic panels to cover the residual needs of the agricultural sector, and considering the surplus resulting from electrification measures
Calculation	Total installed MWp for the agricultural sector
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electricity consumption

Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions related to electricity consumption
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• MWp installed in the Municipality of Prato Source Atlaimpianti GSE • Requests from the Municipality to the energy distributor
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the power of photovoltaic plants built in the Municipality of Prato to cover the electricity needs of the agricultural sector, in order to ensure the use of renewable energy
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.5.4** MWh of purchases from green energy
Indicator Unit	MWh of green energy purchased with Guarantees of Origin (GO) to cover the electricity needs of the agricultural sector
Definition	We want to monitor the amount of green energy purchased with Guarantees of Origin (GO) to cover the electricity needs of the agricultural sector
Calculation	Total amount of green energy purchased with Guarantees of Origin (GO)
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electricity consumption
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions related to electricity consumption

Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Municipality of Prato GSE/GME or Arera suppliers
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the amount of green energy purchased with Guarantees of Origin (GO) to cover the electricity needs of the agricultural sector
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.6** Reduced tCO2 in the transport sector
Indicator Unit	tCO2/inhabitants
Definition	Ratio of tonnes of CO2 related to the transport sector divided by the total number of inhabitants of the Municipality of Prato
Calculation	We want to relate the tonnes of CO2 related to the transport sector divided by the total number of inhabitants of the Municipality of Prato
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Reducing the number of total trips in the Municipality of Prato
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the transport sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Automobile Club D'Italia (ACI) Postal code Istat for demographic data Data from the Ministry
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	

Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the transport sector as a result of the implementation of the actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.6.1** Percentage of daily trips by LPT
Indicator Unit	% of daily trips by LPT
Definition	Strengthening the local public transport system
Calculation	Ratio of LPT trips compared to private transport
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Reducing the number of total trips in the Municipality of Prato
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the transport sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Municipality data
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the transport sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.6.2** Percentage of reduction in travel by private vehicles with internal combustion engine
Indicator Unit	% reduction in travel by private vehicles with internal combustion engine
Definition	Upgrading of urban road infrastructure related to the main road system

Calculation	Reduction in % of journeys by private vehicles with internal combustion engine
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Reducing the number of total trips by private internal combustion vehicles in the Municipality of Prato.
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the transport sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Municipality data
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the transport sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.6.3** No. Daily trips by pedibus and urban school transport
Indicator Unit	Total share of daily journeys by piedibus and urban school transport
Definition	Strengthening the pedibus service and urban school transport
Calculation	Percentage increase of the piedibus and urban school transport service in relation to the share of journeys by internal combustion vehicles.
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Reducing the number of total trips by private internal combustion vehicles in the Municipality of Prato.
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-

Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the transport sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Municipality data identify the pedibus routes implemented and thus the users who use them
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the transport sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.6.4** No. Daily trips by car pooling, bike sharing, car sharing and electric scooters
Indicator Unit	Total share of daily trips by car pooling, bike sharing, car sharing and electric scooters
Definition	Introduction and expansion of daily commuting through car pooling, bike sharing, car sharing and electric scooters
Calculation	Percentage increase in car pooling, bike sharing, car sharing and electric scooters compared to the share of individual trips.
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Reducing the number of total trips by private internal combustion vehicles in the Municipality of Prato.
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the transport sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Municipality data
Expected availability	Expected annual availability of data

Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the transport sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	SECAP

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.6.5** No. of daily trips by rail transport FI-PO and Valbisenzio
Indicator Unit	Daily travel by train FI-PO and Valbisenzio
Definition	Railway service enhancement
Calculation	Increase in the number of journeys by the FI-PO and Valbisenzio train service
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Reducing the number of total trips by private internal combustion vehicles in the Municipality of Prato.
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the transport sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Municipality data
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the transport sector as a result of the implementation of the actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.6.6** No. Daily trips by suburban transport
Indicator Unit	Daily journeys by suburban transport

Definition	Expansion of suburban bus and suburban school transport
Calculation	Increase in the number of journeys by the suburban bus and suburban school transport service
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Reducing the number of total trips by private internal combustion vehicles in the Municipality of Prato.
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the transport sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Municipality data
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the transport sector as a result of the implementation of the actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.6.7** % Reduction in travel for logistics
Indicator Unit	Last Mile' initiative
Definition	Reduction in % of journeys for logistics as a result of the 'Last Mile' initiative and number of electric commercial vehicles
Calculation	Calculation of travel reduction as a result of the 'last mile' initiative
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Reducing the number of total trips by private internal combustion vehicles in the Municipality of Prato.
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-

Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the transport sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Municipality data Aci data
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the transport sector as a result of the implementation of the actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.6.8** No. of electric vehicles for local/extra-urban travel
Indicator Unit	Internal combustion cars replaced by electric cars
Definition	Replacing combustion cars with electric cars.
Calculation	Calculation of the number of internal combustion vehicles replaced by electric vehicles by counting the incentives required
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Reducing the number of total trips by private internal combustion vehicles in the Municipality of Prato.
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the transport sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data	

source	Municipal data: incentive for the purchase of electric citycars or electric scooters Aci data
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors progress in terms of emission reductions in the transport sector, as a result of the implementation of actions in the Climate Neutrality Plan
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.6.9** No. of installed electricity columns
Indicator Unit	Number of electricity columns installed
Definition	Number of electricity columns installed in the territory of the Municipality of Prato
Calculation	Total number of electricity columns installed on the territory of the Municipality of Prato
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	no
If yes, which emission source sectors does it impact?	-
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the transport sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Data Municipality Data from the electricity column operator
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the number of columns that are installed on the territory of the Municipality of Prato to cover the electricity needs from the modernisation of private cars

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.6.10** % municipal fleet replacement
Indicator Unit	% of internal combustion cars replaced in the municipal fleet
Definition	The aim is to monitor the number of cars in the municipal combustion fleet replaced with plug-in electric/hybrid cars
Calculation	Ratio of replaced cars to total cars in the municipal fleet
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	no
If yes, which emission source sectors does it impact?	-
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the transport sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Data Municipality
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the number of cars in the municipal combustion fleet replaced with plug-in electric/hybrid cars
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.6.11** Number of bicycles financed and total km of cycle routes constructed
Indicator Unit	Number of bicycles financed and total km of cycle routes constructed
Definition	To monitor the number of bicycles financed and the total number of kilometres of cycle routes constructed
Calculation	The indicator monitors the total number of bicycles financed and the total number of kilometres of cycle routes constructed

Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	no
If yes, which emission source sectors does it impact?	-
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions in the transport sector
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Data Municipality
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the number of bicycles financed and the total amount of kilometres of cycle routes constructed
Other indicator systems using this indicator	PAESC

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.6.12** Initiated/implemented/not implemented
Indicator Unit	Implementation of interventions for the integration of the urban and extra-urban dimensions of public mobility services and networks (Hub Prato)
Definition	Implementation of interventions for the integration of the urban and extra-urban dimensions of public mobility services and networks (Hub Prato)
Calculation	The indicator is calculated according to the level of progress of the activity in three possible scenarios; started, realised and not realised.
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	-
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes

If yes, which NZC impact pathway is it relevant for?	-
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• SUMP (Urban Sustainable Mobility Plan)
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the progress of interventions for the integration of services and public mobility networks (Hub Prato)
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.6.13** MW installed capacity from photovoltaic panels
Indicator Unit	MWp installed by photovoltaic panels to cover the electricity needs of the mobility sector
Definition	The aim is to monitor the installed capacity in MW of photovoltaic panels to cover the residual needs of the mobility sector and considering the surplus resulting from electrification measures
Calculation	Total installed MWp for the mobility sector
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electricity consumption
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions related to electricity consumption
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• MWp installed in the Municipality of Prato Source Atlaimpianti GSE

	• Requests from the Municipality to the energy distributor
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the power of photovoltaic systems built in the Municipality of Prato to cover the electricity needs of the mobility sector, in order to ensure the use of renewable energy
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.6.14** MWh of purchases from green electricity
Indicator Unit	MWh of green energy purchased with Guarantees of Origin (GO) to cover the electricity needs of the mobility sector
Definition	You want to monitor the amount of green energy purchased with Guarantees of Origin (GO) to cover the electricity needs of the mobility sector
Calculation	Total amount of green energy purchased with Guarantees of Origin (GO)
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electricity consumption
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions related to electricity consumption
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Municipality of Prato GSE/GME or Arera suppliers
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the amount of green energy purchased with Guarantees of Origin (GO) to cover the electricity needs of the mobility sector
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.7.1** MW installed capacity from photovoltaic panels
Indicator Unit	MWp installed by photovoltaic panels to cover the electricity needs of the waste sector
Definition	The aim is to monitor the installed capacity in MW of photovoltaic panels to cover the residual needs of the waste sector and considering the surplus resulting from electrification measures
Calculation	Total MWp installed for the waste sector
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electricity consumption
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions related to electricity consumption
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	• MWp installed in the Municipality of Prato Source Atlaimpianti GSE • Requests from the Municipality to the energy distributor
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the power of photovoltaic plants built in the Municipality of Prato to cover the electricity needs of the waste sector, in order to ensure the use of renewable energy
Other indicator systems using this indicator	-

B-3.2: Indicator Metadata	
(for each indicator selected – take from Comprehensive Indicator Sets)	
Indicator Name	**IN.7.2** MWh of purchases from green electricity

Indicator Unit	MWh of green energy purchased with Guarantees of Origin (GO) to cover the electricity needs of the waste sector
Definition	You want to monitor the amount of green energy purchased with Guarantees of Origin (GO) to cover the electricity needs of the waste sector
Calculation	Total amount of green energy purchased with Guarantees of Origin (GO)
Indicator Context	
Does the indicator measure direct impacts (i.e. reduction in greenhouse gas emissions?)	yes
If yes, which emission source sectors does it impact?	Electricity consumption
Does the indicator measure indirect impacts (i.e. co- benefits)?	no
If yes, which co-benefit does it measure?	-
Can the indicator be used for monitoring impact pathways?	yes
If yes, which NZC impact pathway is it relevant for?	Actions to reduce emissions related to electricity consumption
Is the indicator captured by the existing CDP/ SCIS/ Covenant of Mayors platforms?	yes
Data requirements	
Expected data source	Municipality of Prato GSE/GME or Arera suppliers
Expected availability	Expected annual availability of data
Suggested collection interval	2023-2030
References	
Deliverables describing the indicator	The indicator monitors the amount of green energy purchased with Guarantees of Origin (GO) to cover the electricity needs of the waste sector
Other indicator systems using this indicator	-

4 Part C – Enabling Climate Neutrality by 2030

Part C "Enabling Climate Neutrality by 2030" aims to outline any enabling interventions, i.e. with regard to organizational setting or collaborative governance models, or related to social innovations – designed to support and enable the climate action portfolios described in Module B-2 as well as aiming to achieve co-benefits outlined in the impact pathway (Module B-1).

4.1 Module C-1 Organisational and Governance Innovation Interventions

Module C-1 "Organisational and Governance Innovation Interventions" consists of a summary table, listing organizational and governance interventions and describing their impact (C-1.1) and a section for more detailed descriptions and comments (C-1.2).

C.1.1: Enabling organisational and governance interventions					
Intervention name	Description	Responsible entity/ dept./ person	Involved stakeholder	Enabling impact	Co-benefits
(indicate name of intervention)	(describe the substance of the intervention)	(indicate responsible)	(list all stakeholder involved and affected)	(describe how intervention enables climate neutrality)	(indicate how intervention helps achieve impact listed in Module B-1)
Internal governance constitution to meet the 2030 climate neutrality challenge	Within the city government, a team was established to establish strategically strong relationships between key departments (e.g. energy, mobility, public building);	Municipality of Prato	The internal governance involves the following stakeholders: the Mayor, the Councillors for the Environment, Economic Development, Mobility and Circular Economy and for Budget and Innovation, which will be supported by the Planning and Circular Economy Office as Technical Secretariat, and by a and scientific coordination to be carried out by UNIFI DIDA/DAGRI, CNR IBE/INO	The dedicated transition team coordinates the different skills and perspectives from various disciplines within the city, involving representatives from the various sectors of Prato's society, aims to promote collaboration, innovation and joint investment	
External governance constitutions to meet the 2030 climate neutrality challenge	By promoting the stipulation of a **memorandum of understanding (i.e., DGC no. 20 of 04/02/2022)** with the relevant figures for citizenship (e.g., trade	Municipality of Prato	Pistoia-Prato Chamber of Commerce, Confindustria Toscana Nord, CNA Toscana Centro, Confartigianato Prato, Confesercenti Prato, Confcommercio Prato, Confcooperative, LEGACOOP, CGIL Prato, CISL, UIL,	External governance is a tool facilitating dialogue between the municipal administration and stakeholders in the area within the	

	associations, social partners, public and private bodies) the aim is to functionalise the planning and design of calls for proposals and financing opportunities that will arise in the context of the NRRP. This protocol constitutes a coordination table formed by the subjects identified by the signatory parties, coordinated by the Municipality of Prato, which meets periodically, at least once every two months.		investee companies (ALIA Servizi Ambientali, REVET, GIDA, Interporto della Toscana Centrale, Toscana Energie, ESTRA, Consiag, Autolinee Toscane), social partners (Società della Salute di Prato, USL Toscana Centro, Consulta del Terzo Settore), research bodies and universities (PIN - Polo Universitario Città di Prato, CNR, UNIFI, ENEA, ISPRA).	Mission of the Cities and also with higher levels of government (regional, national, European).	
Bureaucratic simplification actions	It is planned to plan bureaucratic simplification actions and the increase of internal resources necessary for the management and implementation of the Plan's actions. This is to reduce organisational obstacles and decision-making processes.	Municipality of Prato	Municipality of Prato	Bureaucratic simplification may speed up the implementation of emission reduction actions: reducing delays in decision-making processes and project approvals, provided for in the plan enabling faster adaptation to new opportunities, including access to national funding, and emerging energy challenges encouraging greater community participation, making procedures more accessible and understandable,	

				thus involving more stakeholders in the actions of the Plan Ensuring, through an acceleration of the timing of procedures, a saving of financial resources Ensuring the right internal resources to manage all processes to be implemented	
Control Room	A Cabina di Regia (or CoR) is a crucial municipal coordination body for the formulation of targeted operational plans in different thematic areas. Within the framework of the objectives outlined by the National Recovery and Resilience Plan (NRP), a specific CoR dedicated to the drafting of the strategic plan for 'Next Generation Prato' has already been set up in the Prato area. The CoR, when drafting the strategic plan for the Next Generation Meadow, undertakes to coordinate the different components involved in the decision-making process. This includes the definition of clear objectives, the constant monitoring of activities and the periodic evaluation of the results obtained.	Municipality of Prato	Municipality of Prato	This entity would thus play a major role in the synergetic management of collaborative efforts for the implementation of planned projects in the tertiary sector, which include energy efficiency actions (e.g. electrification and management optimisation of thermal consumption) and actions aimed at self-production and purchase of green electricity. In particular, three Steering Cabins will be set up: Cabina di Regia for actions in the public service sector **(State Institutions, Tuscany Region,**	

	From this point of view, the Municipality intends to set up a **steering committee** to coordinate the activities planned in the context of the plan to reduce emissions **in the tertiary sector.** Within the CoR for the tertiary sector, it is intended to involve **local authorities and actors** (e.g. the **diocese**), **Local Health Authorities (ASL)**, **private contracted entities** and **Large-scale Retailers (GDO)**.			**Province of Prato, ASL Toscana Centro, University of Florence, etc.);** Cabina di Regia for actions in the field of private services of public interest **(Diocese of Prato, ETS, Third Sector, Associations, etc.);** Steering committee for private sector actions **(large-scale retail trade, trade and service associations, etc.).**	

C-1.2: Description of organisation and governance interventions – textual and visual elements
(Please provide here any further detail on listed interventions)

4.2 Module C-2 Social and Other Innovation Interventions

Module C-2 “Social and Other Innovation Interventions” consists of a summary table, listing organizational and collaborative governance interventions and describing their impact (C-2.1) and a section for more detailed descriptions and comments (C-2.2).

C.2.1: Enabling social innovation interventions					
Intervention name	Description	Responsible entity/ dept./ person	Involved stakeholder	Enabling impact	Co-benefits
(indicate name of intervention)	(describe the substance of the intervention)	(indicate responsible)	(list all stakeholder involved and affected)	(describe how intervention enables climate neutrality)	(indicate how intervention helps achieve impact listed in Module B-1)
Opening of an Energy Desk	Through the opening of a Help Desk, information and advice will be provided on issues related to energy, energy efficiency and renewable energy sources and renewable energy communities (RECs).	Energy Office of the Municipality of Prato	Municipality of Prato Citizenship Energy Consultants	The Energy Desk is a point of reference for citizens, businesses and public bodies wishing to obtain advice and support for implementing energy efficiency measures. In addition to the Energy Desk, a series of physical and online events, a training programme in schools and a permanent communication campaign will be carried out. Indirect initiatives aim to: - facilitate the authorisation process - make known all the possible incentives that can be accessed to finance the type of intervention concerned	-

				- raising awareness among stakeholders for change	
Introduction of a permanent municipal ordinance aimed at the optimal management of heating systems	It is planned to introduce a new municipal regulation that will define restrictions concerning the use of heating systems. According to this regulation, a maximum heating temperature of 19°C will be set, with a tolerance of ±2°C. In addition, the operating period of the systems will be reduced by 15 days compared to the current regulation. This will result in a delayed start of 8 days compared to the usual date and an earlier end of operation of 7 days compared to the traditional end date. The daily operating time of the plants will be reduced by 1 hour.	Town Planning Office of the Municipality of Prato	Municipality of Prato and Citizenship, Economic Activities	The regulation is a fundamental lever to push citizens and economic actors on the territory of the Municipality of Prato in the conscious use of heating systems, and allowing an important reduction in energy savings. The objective is to better manage the plants and also change the behavioural and cultural model of citizens.	
Building regulations	The revision of the building regulations includes the introduction of stricter limits in terms of energy efficiency and production, anticipating current regulations in Italy. These updates aim to promote sustainability in construction and reduce CO2 emissions.	Energy Office of the Municipality of Prato	Energy Office of the Municipality of Prato Energy distributors in the Municipality of Prato	The Building Regulations will allow for an improvement of the building-installation system in terms of environmental sustainability and reduction of CO2 emissions	

	In line with this direction, public housing in Prato has already launched projects for new '*near* zero energy buildings' (*NZEB),* such as the Piazza Gelli project for 29 public housing dwellings, completed in 2019, or the building *nearing* completion in Via Ferraris, with 32 E.R.P. dwellings (which will achieve energy class A4).				
Plan to define the potential of the electricity grid in relation to both energy fed in and energy withdrawn	A plan is envisaged to define the potential of the electricity grid in relation to both the energy fed in and the energy withdrawn. Barriers to electrification will also have to be highlighted and overcome by means of specific actions (e.g. more internal staff, inter-authorisation simplification, agreements with the distributor to optimise the electricity grid and to open up facilitated channels for those who want to produce energy)	Energy Office of the Municipality of Prato	Energy Office of the Municipality of Prato Energy distributors in the Municipality of Prato Energy consultants	The drafting of the Plan, in order to define the potential of the electricity network, is fundamental for the implementation of the Municipality of Prato's Climate Neutrality Plan, since, in line with the National and European strategic guidelines, it identifies the electrification of consumption as one of the fundamental strategic pillars. This makes it possible to overcome the infrastructural barriers related to the electricity distribution network.	
Public awareness and education events	Education events, both physical and online, will also be organised in schools to raise awareness among citizens about adopting a more sustainable lifestyle with less impact on the environment	Energy Policy Office	Municipality Citizenship Companies	Cultural change is a fundamental and necessary lever for the implementation of the actions envisaged in the Municipality of Prato's Neutrality Plan.	

Mobility Management	Mobility management actions in medium-sized cities like Prato are generally managed by the mobility manager identified in three professional figures: -Mobility managers for companies with more than 300 employees or employing more than 800 people; - Area mobility managers, for local authorities, with coordination functions supporting company mobility managers; - School mobility manager whose actions cover: -organising and coordinating the home-school-home travel of school staff and pupils; -maintaining links with municipal facilities and transport companies; - coordinate with other schools in the same Municipality; -to verify solutions, with the support of the companies operating local road and rail transport services, for the improvement of services and their integration; - ensure intermodality and interchange;	Mobility Office	Municipality Citizenship	**Traffic reduction**: Promoting alternatives to the private car, such as carpooling, public transport and cycling, not only reduces road congestion, but also travel time and the risk of accidents. This improves traffic flow and makes travelling more efficient for all citizens. **Improved air quality**: By reducing the number of vehicles on the road, especially those powered by fossil fuels, air pollution is significantly reduced. This leads to cleaner, healthier air for all residents, with direct benefits on health and quality of life. **Reducing carbon emissions**: Promoting low-carbon means of transport, such as public transport and cycling, actively contributes to the reduction of greenhouse gas emissions. This is essential to tackle the climate crisis and to achieve the emission reduction targets set at international level.	

	promote the use of bicycles and rental services for electric or environmentally friendly vehicles; - report any problems related to the transport of disabled people to the regional school office.				
Purchasing Groups	Purchasing Groups represent communities of citizens united in a wide range of initiatives to promote an ecological and responsible lifestyle. The primary objective of Purchasing Groups is often to obtain discounts or advantageous conditions through collaboration and group strength. One example is the Solidarity Purchasing Groups (GAS) whose peculiarity lies in the fundamental principle of solidarity, which materialises through close collaboration with small local producers sharing values of respect for the environment and for people. This movement, rooted in environmental and social awareness, obtains increasing support from municipal administrations that promote its spread through patronage and active support. Within this initiative, other categories of	Municipality	Municipality Citizens Companies Tertiary activities	Promotion of sustainable energy: Purchasing Groups allow citizens to access sustainable technologies, such as photovoltaic systems and electric cars, at more affordable prices through the negotiation of group discounts. This promotes the widespread adoption of renewable energy sources, contributing to the transition to a more sustainable, low-carbon energy system. Reduced energy costs: By working together and negotiating discounted tariffs, members of Purchasing Groups can save on energy costs, whether through the purchase of certified green energy or the installation of photovoltaic systems. This allows households and small businesses to reduce their energy bills in the long run, while	

	Purchasing Groups have been defined in recent years, which aim to extend their action beyond the traditional procurement of foodstuffs. In particular, focusing on the Parto area, the objective is to create the conditions to form citizens' purchasing groups for the realisation of photovoltaic/solar thermal systems, replacement of boilers, insulation, purchase of certified green energy and purchase of electric cars. The phases of the initiative are subdivided as follows: -Communication campaign : within six months of launch; -collecting pre-applications from households or small businesses; -defining an agreement with installers and banks; -assistance to households and businesses by means of on-site inspection and feasibility; -appointing each customer with a trio of approved installers; -free adherence to the proposals of the partner banks by users. In the context of green electricity, Purchasing			increasing their economic resilience. Encouraging the adoption of eco-friendly technologies: By facilitating access to electric vehicles and sustainable energy solutions at more affordable prices, buying groups encourage the adoption of environmentally friendly practices and technologies. This contributes to reducing air pollution and greenhouse gas emissions, improving air quality and mitigating climate change locally and globally.	

	Groups are now widespread throughout the country, especially with regard to the construction and installation of photovoltaic systems on roofs and small privately owned land. One example is the GASEnergia Association, the association's main objectives are: -promotion of savings and efficiency as the main renewable sources; -purchase of certified green electricity; -promotion of self-production by individuals and territories; -promotion of projects of particular significance. GAs can negotiate with energy suppliers to obtain discounted rates or special conditions for group members. This can be done through the collective purchase of large quantities of energy, which allows members to benefit from lower prices than they could obtain individually. In the case of PV installation, GAs can negotiate with suppliers and installers to obtain group discounts on the purchase and installation of solar				

	panels. This collective approach allows members to access sustainable technologies at a more affordable cost, promoting the widespread adoption of renewable energy solutions. With regard to the purchase of electric cars, GAs can negotiate with dealers or directly with manufacturers to obtain group discounts on the purchase of zero-emission vehicles. This type of collaboration gives members access to cheaper automotive technology, while encouraging the adoption of environmentally friendly vehicles.				

C-2.2: Description of social innovation interventions – textual and visual elements
(Please provide here any further detail on listed interventions)

4.3 Module C-3 Financing of Action Portfolio

Module C-3 "Financing of Action Portfolio" should contain the list of action portfolios and interventions outlined in Modules B-2, and those from C-1 and C-2 with cost implication to provide a summary list of interventions that need to be unpacked in the Investment Plan.

		C-3.1: Summary of interventions with cost implication (to be unpacked in Investment Plan)					
		Action/ intervention name	Responsible entity and person	Start/end date	Field of action	Impact	Total cost estimated
1.1	**Residential buildings**	Energy requalification of private residential buildings	Energy Policy Office, Private Building Office	2023-2030	Residential buildings	- GHG reduction of 8,166.18 tCO2 - Increased energy efficiency or rate of retrofit - Reduced energy demand, needs, or consumption	777.850.000 €
1.2		Replacing boilers with heat pumps	Energy Policy Office, Private Building Office	2023-2030	Residential buildings	- GHG reduction of 44,194.77 tCO2 - Increased energy efficiency or rate of retrofit - Enhanced stability of urban infrastructure	207.000.000 €
1.3		Replacing gas hobs with induction hobs	Energy Policy Office, Private Building Office	2023-2030	Residential buildings	- GHG reduction of 11,343.88 tCO2 - Increased energy efficiency or rate of retrofit - Enhanced stability of urban infrastructure	56.000.000 €
1.4		Replacing an obsolete household appliance for low-income households	Energy Policy Office, Private Building Office	2023-2030	Residential buildings	- GHG reduction of 261.42 tCO2 - Increased energy efficiency or rate of retrofit - Reduced energy demand, needs, or consumption	5.470.000 €

1.5		Replacement of fluorescent lamps with LED lamps in residential buildings	Energy Policy Office, Private Building Office	2023-2030	Residential buildings	- GHG reduction of 450.72 tCO_2 - Increased energy efficiency or rate of retrofit - Enhanced stability of urban infrastructure	374.386 €
1.6		Introduction of a permanent municipal ordinance aimed at the optimal management of air conditioning systems in residential buildings	Energy Policy Office, Private Building Office	2023-2030	Residential buildings	- GHG reduction of 10,445.00 tCO_2 - Local economic activity & global connectivity - Reduced energy demand, needs, or consumption ● Improved air quality ● Enhanced livability in the home environmentù ● Increased technological readiness & rate of adoption ● Reduced energy demand, needs, or consumption	50.000,00 €
1.7		Installation of photovoltaic panels on residential buildings	Energy Policy Office, Private Building Office	2023-2030	Residential buildings	- GHG reduction of 26,478.76 tCO_2 - Increased energy efficiency or rate of retrofit - Reduced energy demand, needs, or consumption	145.000.000 €
1.8		Purchases of green electricity to cover residential electricity needs	Energy Policy Office, Private Building Office	2023-2030	Residential buildings	- GHG reduction of 105,915.04 tCO_2 - Increased energy efficiency or rate of retrofit - Reduced energy demand, needs, or consumption	180.000.000,00 €

2.1	**Industries**	Ecological transition of the industrial district (Macrolotto 1, Macrolotto 2 and Artisan Areas)	Economic Development Office	2023-2030	Industrial sector	- Reduced greenhouse gas emissions by 49,329.18 tCO2 - Increased energy efficiency or rate of retrofit - Reduced energy demand, needs, or consumption	238.000.000,00 €
2.2		Production from RES in other industrial areas.	Economic Development Office	2023-2030	Industrial sector	- Reduction of greenhouse gas emissions by 4,620 tCO2 - Increased energy efficiency or rate of retrofit - Reduced energy demand, needs, or consumption	20.000.000,00 €
2.3		Energy efficiency of companies in the textile district	Economic Development Office	2023-2030	Industrial sector	- Reduced greenhouse gas emissions by 63,002 tCO2 - Increased energy efficiency or rate of retrofit - Reduced energy demand, needs, or consumption	105.000.000,00 €

2.4		Adhesion of the Textile District to specific programmes in line with Net Zero initiatives for the reduction of thermal and electrical consumption excluding RES	Economic Development Office	2023-2030	Industrial sector	- Reduction of greenhouse gas emissions by 38,233 tCO2 - Local economic activity & global connectivity - Reduced energy demand, needs, or consumption	64.000.000,00 €
2.5		"Positive Energy District' at consortium level	Economic Development Office	2023-2030	Industrial sector	- Greenhouse gas emission reduction *not defined* - Local economic activity & global connectivity - Reduced energy demand, needs, or consumption	150.000,00 €
2.6		Green electricity procurement in the industrial sector	Economic Development Office, Energy Policy Office	2023-2030	Industrial sector	- Reduction of greenhouse gas emissions by 60,663 tCO2 - Increased energy efficiency - Reduced energy demand, needs, or consumption	109.000.000,00 €
3.1	**Public Buildings**	New Energy Service	Energy Policy Office	2023-2030	Public Buildings & Public Lighting	- Reduction of greenhouse gas emissions by 1,100 tCO2 -Enhanced stability of urban infrastructure -Reduced energy demand, needs, or consumption	22.255.407,00 €
3.2		Efficiency enhancement of sports facilities	Sports Building Office	2023-2030	Public Buildings & Public Lighting	- Reduction of greenhouse gas emissions by 225 tCO2 - Enhanced stability of urban infrastructure - Reduced energy	2.000.000,00 €

							demand, needs, or consumption	
3.3		Re-lamping of lighting systems of outdoor and otudoor sports fields	Sports Building Office	2023-2030	Public Buildings & Public Lighting	- Reduction of greenhouse gas emissions *not defined* - Increased access to clean, stable, affordable energy - Reduced energy demand, needs, or consumption	900.000,00 €
3.4		Re-lamping of swimming pool and indoor lighting systems	Sports Building Office	2023-2030	Public Buildings & Public Lighting	- Reduced greenhouse gas emissions by 2,310 tCO2 - Increased access to clean, stable, affordable energy - Reduced energy demand, needs, or consumption	500.000,00 €
3.5.1		Energy requalification of ordinary lighting systems serving public buildings: Palazzo Benassai and Palazzo Comunale	Energy Policy Office	2023-2030	Public Buildings & Public Lighting	- Reduction of greenhouse gas emissions by 31.76 tCO2 - Increased energy efficiency - Reduced energy demand, needs, or consumption	200.000,00 €
3.5.2		Energy requalification of ordinary lighting installations serving other public buildings	Energy Policy Office	2023-2030	Public Buildings & Public Lighting	- Reduction of greenhouse gas emissions by 1,177 tCO2 - Increased energy efficiency - Reduced energy demand, needs, or consumption	4.000.000,00 €

3.6.1		Redevelopment of Public Residential Housing (ERP) carried out	Building Office	2023-2030	Public Buildings & Public Lighting	- Reduction of greenhouse gas emissions by 124 tCO2 - Enhanced stability of urban infrastructure - Reduced energy demand, needs, or consumption	125.000,00 €
3.6.2		Redevelopment of Public Residential Housing for Housing Assistance (ERP) planned	Building Office	2023-2030	Public Buildings & Public Lighting	- Reduction of greenhouse gas emissions by 139 tCO2 - Enhanced stability of urban infrastructure - Reduced energy demand, needs, or consumption	4.500.000,00 €
3.7		Installation of photovoltaic systems	Energy Policy Office	2023-2030	Public Buildings & Public Lighting	- Reduction of greenhouse gas emissions by 1,386 tCO2 - Increased energy efficiency - Reduced energy demand, needs, or consumption	8.200.000,00 €
3.8		Purchases of green electricity to cover the energy needs of municipal buildings and public lighting	Public Lighting Offices	2023-2023	Public Buildings & Public Lighting	- Reduction of greenhouse gas emissions by 2,839 tCO2 - Increased energy efficiency - Reduced energy demand, needs, or consumption	12.000.000,00 €
4.1	**Buildings, equipment /tertiary installations (non-municipal)**	Replacing boilers with heat pumps in tertiary buildings	Energy Policy Office, Private Building Office	2023-2030	Tertiary Sector	- Reduction of greenhouse gas emissions by 3803.48 tCO2 - Increased energy efficiency - Reduced energy demand, needs, or consumption	225.000.000,00 €

4.2		Introduction of a municipal ordinance aimed at the optimal management of heating systems in tertiary activities	Energy Policy Office, Private Building Office	2023-2030	Tertiary Sector	- Reduction of greenhouse gas emissions by 863.76 tCO2 - Increased energy efficiency - Reduced energy demand, needs, or consumption	50.000,00 €
4.3		Installation of photovoltaic panels to cover the electrical needs of the tertiary sector	Energy Policy Office, Private Building Office	2023-2030	Tertiary Sector	- Reduction of greenhouse gas emissions by 26,318.60 tCO2 - Increased energy efficiency - Reduced energy demand, needs, or consumption	115.000.000,00 €
4.4		Purchases of green electricity to cover the electricity needs of the tertiary sector	Energy Policy Office, Private Building Office	2023-2030	Tertiary Sector	- Reduction of greenhouse gas emissions by 104,929 tCO2 - Increased energy efficiency - Reduced energy demand, needs, or consumption	130.000.000,00 €
5.1	**Agriculture**	Replacing diesel agricultural tractors with biodiesel tractors	Municipality of Prato	2023-2030	Agricultural Sector	- Reduced greenhouse gas emissions by 1,519.7 tCO2 - Increased technological readiness & rate of adoption - Reduced energy demand, needs, or consumption	11.970.000,00 €

5.2		Modernisation of agricultural machinery and vehicle fleet	Municipality of Prato	2023-2030	Agricultural Sector	- Reduced greenhouse gas emissions by 759.9 tCO2 - Increased energy efficiency or rate of retrofit (including district heating) - Increased technological readiness & rate of adoption	2.280.000,00 €
5.3		Agrivoltaic	Municipality of Prato	2023-2030	Agricultural Sector	- Reduced greenhouse gas emissions by 85,811 tCO2 -Increased technological readiness & rate of adoption -Reduced energy demand, needs, or consumption	380.000.000,00 €
5.4		Purchases of green electricity to cover the electricity needs of the agricultural sector	Municipality of Prato	2023-2030	Agricultural Sector	- Reduced greenhouse gas emissions by 1064.8 tCO2 - Decreased modal share of private vehicles) - Reduced energy demand, needs, or consumption	1.800.000,00 €
6.1	**Transport**	Strengthening the local public transport system	Mobility Office Municipality of Prato	2023-2030	Mobility and Transport Sector	- Reduced greenhouse gas emissions by 68,750 tCO2 - Decreased modal share of private vehicles - Reduced energy demand, needs, or consumption	245.000.000 €

6.2		Infrastructure enhancement to facilitate access to LPT	Mobility Office Municipality of Prato	2023-2030	Mobility and Transport Sector	- Reduced greenhouse gas emissions by 11,931.82 tCO2 - Decreased modal share of private vehicles - Reduced energy demand, needs, or consumption	105.000.000 €
6.3		Strengthening the pedibus and enhancing urban school transport	Mobility Office Municipality of Prato Urban Planning Office	2023-2030	Mobility and Transport Sector	- Reduced greenhouse gas emissions by 1,875 tCO2 - Decreased modal share of private vehicles - Reduced energy demand, needs, or consumption	4.200.000 €
6.4		Introduction of car pooling, car sharing, bike sharing and electric scooters	Mobility Office Municipality of Prato Urban Planning Office	2023-2030	Mobility and Transport Sector	- Reduced greenhouse gas emissions by 937.50 tCO2 - Increased energy efficiency or rate of retrofit (including district heating) - Reduced energy demand, needs, or consumption	2.000.000 €
6.5		Strengthening railway transport FI-PO and Valbisenzio	Mobility Office Municipality of Prato Urban Planning Office	2023-2030	Mobility and Transport Sector	- Reduced greenhouse gas emissions by 20,531 tCO2 - Increased energy efficiency or rate of retrofit (including district heating) - Reduced energy demand, needs, or consumption	28.000.000,00 €

6.6		Enhancing suburban transport	Mobility Office Municipality of Prato Urban Planning Office	2023-2030	Mobility and Transport Sector	- Reduced greenhouse gas emissions by 23,375 tCO2 - Decreased modal share of private vehicles - Reduced energy demand, needs, or consumption	7.500.000,00 €
6.7		Last Mile' initiative	Mobility Office Municipality of Prato Urban Planning Office	2023-2030	Mobility and Transport Sector	- Reduced greenhouse gas emissions by 26,250 tCO2 - Decreased modal share of private vehicles - Reduced energy demand, needs, or consumption	900.000,00 €
6.8		Replacement of internal combustion vehicles by electric vehicles	Mobility Office Municipality of Prato Urban Planning Office	2023-2030	Mobility and Transport Sector	- Reduced greenhouse gas emissions by 28,987.92 tCO2 - Decreased modal share of private vehicles - Reduced energy demand, needs, or consumption	1.127.850.000 €
6.9		Construction of electricity columns	Mobility Office Municipality of Prato Urban Planning Office Companies that build and operate electricity columns	2023-2030	Mobility and Transport Sector	- Greenhouse gas emission reduction *not defined* - Decreased modal share of private vehicles - Reduced energy demand, needs, or consumption	132.000.000,00 €

6.10		Modernisation of the municipal fleet	Provisioning Office	2023-2030	Mobility and Transport Sector	- Reduced greenhouse gas emissions by 118 tCO2 - Decreased modal share of private vehicles - Reduced energy demand, needs, or consumption	5.000.000,00 €
6.11		Increasing soft mobility by expanding and improving the city's cycle network and encouraging the purchase of bicycles.	Mobility Office Municipality of Prato	2023-2030	Mobility and Transport Sector	- Reduced greenhouse gas emissions by 5,245 tCO2 - Decreased modal share of private vehicles - Reduced energy demand, needs, or consumption	122.000.000,00 €
6.12		Hub Prato	Mobility Office Municipality of Prato	2023-2030	Mobility and Transport Sector	- Greenhouse gas emission reduction *not defined* - Decreased modal share of private vehicles - Reduced energy demand, needs, or consumption	*2.186.000,00 €*
6.13		Installation of photovoltaic panels for the electricity needs of the mobility sector	Mobility Office Municipality of Prato Urban Planning Office	2023-2030	Mobility and Transport Sector	- Reduced greenhouse gas emissions by 2,772 tCO2 - Decreased modal share of private vehicles - Reduced energy demand, needs, or consumption	15.000.000,00 €

6.14		Green electricity purchases for the electricity needs of the mobility sector	Mobility Office Municipality of Prato Urban Planning Office	2023-2030	Mobility and Transport Sector	- Reduced greenhouse gas emissions by 21,275 tCO2 - Decreased modal share of private vehicles - Reduced energy demand, needs, or consumption	28.000.000,00 €
7.1	**Waste**	Installation of photovoltaic panels for waste electrical needs	Municipality Office Urban Planning Office Agreements with investee companies	2023-2030	Waste sector	- Reduced GHG emissions by 693 tCO2 - Reduced GHG emissions - Reduced energy demand, needs, or consumption	3.000.000,00 €
7.2		Purchases of green electricity for the electricity needs of the waste sector	Municipality Office Urban Planning Office Agreements with investee companies	2023-2030	Waste sector	- Reduced GHG emissions of 12,282 tCO2 - Reduced GHG emissions - Reduced energy demand, needs, or consumption	19.000.000,00 €

5 Outlook and next steps

This section should draw any necessary conclusions on the Action Plan above and highlight next steps and plans for further refining the Action Plan as part of the Climate City Contract.

Plans for next CCC and Action Plan iteration – textual elements
(please add your text here)

6 Annexes

Add any textual or **visual material** to the 2030 Climate Neutrality Action Plan in the ANNEX as necessary.

NET ZERO CITIES
EU MISSION PLATFORM | CLIMATE NEUTRAL AND SMART CITIES

Climate City Contract

2030 Climate Neutrality Commitments

of the City of Prato

Disclaimer

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Table of contents

1 Introduction

Explain your city's motivation to join the EU Mission '100 climate-neutral and smart cities by 2030' and highlight your city's present commitments to climate action. You may also want to include the aims of this document.

Your text
"Prato is a vibrant, contradictory, innovative, conflictual city: a city that, since the beginning of the 20th century and particularly after the Second World War, has been a formidable urban, social, cultural and economic laboratory in which new models have often been experimented. Today, compared to international metropolises, it is a small city, but within it has all their complexity. In fact, it is part of those medium-sized cities in which new social models of coexistence, new forms of production, and innovative ways of educating the younger generations are being experimented globally: medium-sized cities that are endowed with that flexibility, capacity to absorb change, and readiness for innovation necessary to verify the effects of these transformations in a short time and indicate new possible scenarios towards which to set out on the difficult path of overcoming the international economic crisis. Prato is an ever-changing reality. Prato aims to increasingly characterise itself as a place of contemporaneity, a place where its important signs of the past and those of today find new forms of dialogue. Prato then shall be understood as the city of fashion, of visual and performing arts, of coexistence and multiculturalism, of new economic sectors, of experimentation in the circular economy and urban practices of re cycling, of innovation in youth training, as a sustainable and young city, of participation and openness in civic practices related to the commons, a city of innovation and social inclusion, a city of solidarity. Prato with its 196,277 inhabitants is the second largest city in Tuscany and the third largest in Central Italy in terms of number of residents. It is world-famous for its textile district, with more than 3.500 SMEs, which account for about 3% of European textile production, making it the most important district in Europe. The textile district's strategies over the years have led to choices aimed at sustainability and the strengthening in research and development of the traditional sector, i.e. that based on the regeneration of fibres from used clothes, which has made Prato a forerunner of circular economy practices in the past and which today can count on the great professionalism of its workers. Alongside the textile district, since the 1990s the fast fashion district has grown, which, with more than 4,000 clothing companies, makes Prato a leader in Europe and a reference point for large-scale organised distribution. Tradition and innovation come together to form a strong combination that has transformed Prato in recent years into a city that has based its wealth on a lively cultural *melting pot* with more than 130 nations from around the world, integrating different cultures, knowledge and lifestyles. Prato plays a strategic role in the regional context and in the metropolitan area Florence – Prato - Pistoia, and with respect to this assumption the municipal administration has elaborated a medium-long term vision, based on a perspective of Sustainable Development, as a strategic prerogative on which to concentrate planning and towards which to converge the actions of both public and private sectors. Prato also has a great tradition in innovation not only in its manufacturing production but also in the local government's ability to experiment in services to citizens, thanks to the possibilities offered by information technology and new organisational methods. In recent years, the municipality has worked intensively to equip itself with a number of strategic planning tools with the aim of efficiently orienting its actions, especially on the themes of digital, ecological and circular transition. It is in this direction that the City of Prato's adhesion to the EU Mission '100 Climate Neutral & Smart Cities' and thus its commitment to achieve climate neutrality by 2030 should be read.

2 Goal: Climate neutrality by 2030

Articulate your 2030 climate neutrality ambition, as expressed and defined in your Cities Mission Expression of Interest (EoI). This should include your ambition and commitment to a 2030 horizon as a whole city, as well as describe any exclusion areas and summarise how these areas would be addressed beyond 2030. (A more detailed plan for exclusion areas should be included in the 2030 Climate Neutrality Action Plan.) Your 2030 ambition should be supported at a minimum by a Council decision, and it is recommended that it is also supported by a wider stakeholder group. We also recommend you to list other co-benefits you aim to achieve when working towards the climate neutrality goal, like well-being, health, equity, justice, financial savings.

Your text

Prato is recognized as housing Europe's largest textile district and is a global leader in sustainable textile practices. The city launched the **Prato Green Deal** in 2014, a comprehensive approach aimed at integrating environmental policies to achieve climate neutrality. This initiative focuses on ecological transition, circular urban metabolism, and smart city concepts, employing various planning and governance tools to address environmental, sustainable mobility, energy, and circularity issues. These tools include plans and projects like the **Municipal Operational Plan**, **Sustainable Energy Action Plan** (SEAP), **Sustainable Energy and Climate Action Plan** (SECAP), **Prato Forest City, Prato Urban Jungle**, **Riversibility**, **Sustainable Urban Mobility Plan** (SUMP), and initiatives for energy efficiency and circular urban development funded by the **European Regional Development Fund** (ERDF).
In April 2014, Prato joined the Covenant of Mayors, committing to a 20% reduction in CO_2 emissions by 2020 alongside the European Commission. The SEAP, adopted in December 2015, aimed to better integrate environmental policies within Prato, focusing on the energy renovation of public assets, reducing consumption, enhancing energy efficiency across various sectors, and promoting renewable energy and energy-saving practices among residents and businesses.
Continuing these efforts, Prato reaffirmed its commitment in 2019 by joining the Covenant of Mayors for Climate and Energy, targeting a 40% reduction in CO_2 emissions by 2030 and enhancing climate change resilience. The city's strategy towards climate neutrality, initiated in 2019, links urban, environmental, forestry, and health planning in collaboration with the Tuscany Region, unfolding in three phases:

Phase 1: Analysis of Environmental Data, Trees, and CO_2 Emissions (completed)
Through a collaboration with CNR IBE, we conducted a comprehensive analysis of the city's climatic and environmental conditions, leveraging:

a) Sentinel satellite and hyperspectral flight data for monitoring summer surface temperatures, urban heat island effects, vegetation indices, land use, tree canopy, surface reflectivity, sky view factor, and carbon sequestration capabilities;
b) The deployment of 45 AirQuino sensors across the city for continuous monitoring of temperature, humidity, particulate matter (PM10, PM2.5), CO_2 levels, and other pollutants;
c) The installation of an Eddy Covariance super-station in June 2021 to track CO_2 levels and gas exchanges, providing high-frequency urban flux measurements to evaluate seasonal dynamics and the impact of mitigation efforts;
d) The creation of a Digital Twin system in partnership with CNR IBE, integrating sensor network data, satellite observations, climate and atmospheric information, socioeconomic data, and models to describe inter-variable relationships (https://dev.airqino.it/digital_twin/);
e) For the Structural Plan, we correlated environmental data from the Digital Twin with demographic and socioeconomic indicators in the Social Vulnerability Index (SoVI) to identify areas where lower-income and vulnerable populations face higher risks from heatwaves and lack access to public green spaces, by using data such as:

- Population density segmented by census area, with specific attention to vulnerable groups aged 0-5, 6-11, and over 65;

- Deprivation index, comprising four indicators of socio-economic hardship: low education levels, unemployment rates, the proportion of rented homes, and household density per census area;
- Prevalence of single-person households, referred to as the density of 'lone persons';
- Built-up area ratio, calculated as the proportion of developed land to the total area of each census section;
- Income levels, analysed by dividing the average household income into deciles within each census section.

The integrated mapping of environmental, demographic and socioeconomic data has made it possible on the city of Prato to quantitatively highlight how the weakest groups, with lower income, are also those subject to greater risks of heat waves, and characterised by greater distance from public green infrastructures. This integrated analysis has highlighted the need for policy development that considers social, economic, and environmental factors simultaneously. The Diffuse Forestation project identifies priority areas for mitigating environmental issues affecting vulnerable groups.
f) Within the general framework of the SECAP, an update of all emission data of the city was carried out.

Step 2: Assessment of the maximum CO2 storage capacity achievable through forestation (completed).

a) Percentage increases in green areas, to assess mitigation capacity.
b) Wood volume increases to assess carbon storage capacity in relation to the plants used and their size/age.
c) A modeling approach to determine mitigation contributions from various species sizes and types.

Step 3: Definition of actions to be developed in different areas to achieve climate neutrality, based on data from Step 2 and related to

- Sustainable mobility, through the implementation of further strategies dedicated to the private and public sector;
- Existing buildings, through retrofitting and energy efficiency of public and private buildings, to be defined in the SECAP;
- Industrial production and public services, with the implementation of *carbon neutral* strategies by private and public companies, working together in the city's governance model for Prato's circular and green transition.

Joining the EU Mission '100 Climate Neutral and Smart Cities', Prato aims for climate neutrality by 2030, targeting an 83% reduction in CO2 emissions from 2019 levels, used as the reference year, throughout the entire municipal territory. The remaining part of the emissions will be compensated through specific carbon storage/absorption actions implemented on a municipal scale. This orientation was also reaffirmed in the Sustainable Energy and Climate Action Plan (SECAP), approved by City Council Resolution No. 8 of 22 February 2024.

3 Key priorities and strategic interventions

This is the core section of the Commitments document that should summarise **at least 3 or 4 systemic strategic priorities** that need to be implemented for your city to become climate neutral by 2030. These should be meaningful changes that will have a profound impact on reducing GHG emissions in your city, like decarbonising the heating system in the city or generating 100% energy from renewables. The individual commitments between your city and other stakeholders should address these key priorities and contribute to reaching them. The annexed 2030 Climate Neutrality Action Plan should describe all interventions, including those to reach your priorities as well as all further actions, in detail and describe how your city plans to implement them.

Your text

In line with Prato's goal to reach climate neutrality by 2030, the development of the Climate City Contract's strategic directions was informed by an evaluation of existing planning tools, insights from thematic discussions, and key national strategies (National Recovery and Resilience Plan, Integrated National Energy and Climate Plan). Based on an assessment of these planning resources, the local and national objectives, and the current state of technology, we propose initial overarching guidelines to shape the forthcoming specific interventions:

- Decarbonize heating and electricity usage through demand reduction and enhancing the efficiency of systems in both the civil and industrial sectors;
- Advance the shift towards electric power for civil energy use and transportation;
- Boost local generation of renewable energy, with a focus on solar photovoltaic systems;
- Encourage the use of renewable energy sources, whether locally produced or not;
- Foster sustainable consumption habits that minimize raw material use and maximize their reuse and recycling;
- Support the adoption of sustainable and low-impact transportation options;
- Enhance the capacity for carbon sequestration.

By adopting these measures, the Municipality of Prato aims to fulfill its ambitious objective of climate neutrality by 2030, cutting CO_2 emissions by 83% and compensating for the remaining emissions through carbon sequestration efforts.

4 Principles and process

Highlight the key principles that will guide your city as it implements its Climate City Contract, like accountability, transparency, or an open attitude to new approaches. The process should encompass principles like **co-creation, innovation, multi-actor and citizen engagement,** and should be **systemic and demand-driven in nature.** It should also be based on **monitoring** and **joint learning**. The Commitments Guidance document provides more specific guidance on how to integrate these principles into your own process.

Your text

Climate Governance. Urban areas are among the main contributors to the ongoing climate crisis. In our vision, the city system, understood as the interconnection between inhabited areas, commercial and industrial zones, green and agricultural areas, must be at the center of new strategies for sustainable development and of the paradigm shift in the economic, environmental, and social logics. Urban policies must therefore integrate health, urban planning, environmental, mobility and innovation policies into a single integrated sustainable urban development strategy aiming at building more resilient and healthier cities. With the Urban Agenda 2050, Prato commits to a bold, future-oriented vision emphasizing human health and a renewed collaboration across economic, social, and cultural policies, which prioritizes digital and circular transitions, the social impact of economic practices, local supply chains, environmental initiatives, urban forestry, nature-based solutions, and sustainable mobility as key drivers of sustainable growth, resilience, and community well-being. Climate governance will then be based on two main pillars:

- **Next Generation Prato,** which is the result of an intense process of reflection, sharing and dialogue with the main stakeholders on the strategy that the city intends to adopt for the implementation of the National Recovery and Resilience Plan, addressing issues and proposing a portfolio of projects that ensure the ecological transition and new economic models capable of producing positive impacts in the territories, promotes a new concept of urban governance, which brings together public administrations, enterprises, the third sector, universities and citizens, emphasizing the centrality of environmental and nature issues in Prato's urban policies. The signatories of the 'Memorandum of Understanding for the Governance of the Next Generation Prato' include the Municipality of Prato and a number of significant entities in the area: the PIN - Polo Universitario Città di Prato, the

Pistoia-Prato Chamber of Commerce, Confindustria Toscana Nord, Cna Toscana Centro, Confartigianato Prato, Confesercenti Prato, Confcommercio Prato, Confcooperative, Legacoop, Cgil Prato, Cisl and Uil. The parties have agreed to work closely with the city administration, with the aim to enhance the exchange of information about funding opportunities in sectors considered priority and strategic, and share human resources and expertise to ensure the success of the funded projects.

- **Prato Circular City,** which since 2020 has been the strategic initiative led by the city government to enhance Prato's reputation as a "circular city", set up a permanent table with local stakeholders to promote shared, integrated and participatory circular economy actions and build a circular city governance. Prato Circular City proposes four main areas of focus: revitalizing the textile sector, urban resource management, managing urban resources, encouraging circular consumption, and promoting sustainable urban farming practices, with governance as a cross-cutting theme reflecting the most important aspects in the city's transition to the circular economy. In the context of "Prato Circular City", special emphasis has been placed on the sustainability of the textile and fashion industry's products and processes, which in the recent years has become a crucial concern. Many companies in the district stand out for their commitment to the environment and quality, achieving various Oeko-Tex and Global Recycled Standard (GRS) certifications, alongside adherence to the DETOX protocol, which underlines the ever-increasing commitment to sustainability as a fundamental value within the district's operations. To tackle these challenges and effectively progress towards a circular economy, specific working groups have been established in collaboration with economic and social sectors, including:

- An observatory on the end-of-waste regulation, to monitor and influence regulatory development related to the end-of-life of products;
- An observatory on labour and training needs, dedicated to analysing the sector's labour and training needs to support the adaptation of skills to new market demands;
- A cross-disciplinary working group on environmental and digital transition to explore and implement digital solutions that can support sustainability and efficiency in the sector.

These working groups represent a strategic and coordinated approach to address environmental, economic and social challenges in the district, while promoting innovation and sustainability in line with the goals of "Prato Circular City".

A key initiative focused on promoting a range of activities to enhance energy efficiency within the textile sector through to 2030. In this regard, during 2023, 38 businesses within the Prato textile district started implementing energy efficiency projects, facilitated by a funding initiative managed collaboratively by the Municipality of Prato and the Chamber of Commerce of Pistoia-Prato, working closely with local economic and social groups. These initiatives, which aim to reduce thermal and electrical consumption, especially in SMEs, are part of a wider programme that aims to finance around 300 projects by 2030. Funded projects fall into two categories: those aimed at reducing thermal energy consumption, through the adoption of technologies such as the replacement of steam generators, the reuse of thermal waste, insulation and the installation of energy monitoring systems; and those aimed at improving electricity consumption, through the replacement of motors and compressors with more efficient solutions, the modernisation of lighting systems and rational energy management. This initiative seeks to build upon the existing success of the funding program, motivating businesses to switch to renewable electricity sources and promoting energy awareness campaigns.

Participatory co-design and involvement of stakeholders and citizens. The co-design process of the Climate City Contract in Prato was carried out following the systemic approach proposed by Net Zero Cities, based on a collaborative action aimed at understanding the interdependencies between local actors and their actions. This made it possible to identify and address the barriers to

change (Understand the system - Phase 1) and subsequently co-create a set of actions (Co-design a portfolio - Phase 2) to overcome them. During this process, characterised by a strong dependence on the city context, efforts were made to create synergies between public administration, stakeholders and citizenship. The aim was to actively involve collective intelligence in a transition process that led to the implementation of meaningful initiatives to achieve climate neutrality. The result was a systemic transformation, crossing different sectors and spheres of the city, working on technical solutions, democratic participation, capacity building, economic sustainability and social innovation. This process required collaborative, flexible, and adaptable governance over time, capable of involving all actors at different levels of commitment, to work together actively towards a more sustainable city. This involved engaging economic categories (Pistoia-Prato Chamber of Commerce, Confindustria Toscana Nord, CNA Toscana Centro, Confartigianato Prato, Confesercenti Prato, Confcommercio Prato, Confcommercio Prato, Confcooperative, LEGACOOP, CGIL Prato, CISL, UIL), public companies (ALIA Servizi Ambientali, REVET, GIDA, Interporto della Toscana Centrale, Toscana Energie, ESTRA, Consiag, Autolinee Toscane), social partners (Società della Salute di Prato, USL Toscana Centro, Consulta del Terzo Settore), research bodies and universities (PIN - Polo Universitario Città di Prato, CNR, UNIFI, ENEA, ISPRA) in a series of co-participatory planning workshops.
The first phase of the co-design process (Understand the system) took place between October and December 2022 and was characterised by 8 meetings involving 15 categories of stakeholders on the topics of energy efficiency, sustainable mobility, circular economy, urban forestry, agriculture and land use.
The first stakeholder group consisted of the municipal companies (5), category associations (6), research institutes, large retail organizations (1), companies (20), agricultural associations linked to the short supply chain (6), farms (4), professionals (6), environmental associations (2), bodies linked to mobility (3) and public administration (land government, roads service, town planning, agriculture and environment); the second group by trade associations (6), companies and start-ups (6), sports clubs (2), businesses (5), public administration; the third group by third sector bodies (8) and the fourth consisted of the City Council of boys and girls.
The second phase of the co-design pathway (Co-design a portfolio) was articulated in four workshops that took place in January 2023, engaging stakeholders across energy efficiency, sustainable mobility, circular economy, and urban afforestation, agriculture, and land use, supported by experts in the various thematic areas of the University of Florence, with the aim of co-creating impact pathways, through the definition of concrete and radical actions, expected medium and long-term results and direct and indirect co-benefits.

- workshop on energy efficiency ->15 participants
- workshop on sustainable mobility ->10 participants
- workshop on circular economy ->10 participants
- workshop on urban forestry, agriculture and land use ->10 participants

The municipal administration played a crucial role, promoting public debate through general planning, development of specific projects, implementation of actions, adaptation of regulations and involvement of stakeholders. This daily commitment has made it possible to transform environmental strategies from a public administration initiative to a project shared at all levels of the city, with the active participation of all citizens.

Economic development based on the principles of the SDGs. Prato is one of the largest textile centres in Europe and a global leader in yarn and woollen fabric production. With over 7,000 businesses, the Prato district is renowned for its fabrics for the clothing industry, furnishing textiles, knitting yarns, knitted products and garments, non-wovens and special fabrics for industrial uses. The district of Prato has historically based its fortunes on the reuse of textile waste from production and clothing waste from all over the world. This activity was made possible in the past thanks to the support of the district's innovative mechanical-textile industry, which was able to design machineries to recycle these fractions that would otherwise have been considered waste. The issue of product and process sustainability in the textile & clothing supply chain has become strategic in recent years. The city administration has promoted a series of initiatives, projects and recently a series of calls for proposals to promote the digital and ecological transition of the district thanks to an extraordinary contribution of EUR 10 million from the state's 2021 budget law, to support the digital and ecological transformation of the district. These projects align with several strategic actions:

- Socio-environmental sustainability in production, including energy efficiency improvements, ecological company transitions, circular economy solutions, and enhancements in workplace health, safety, and prevention culture, all within the framework of a just transition.
- Technological and digital evolution, emphasizing the digital advancement of small and medium-sized enterprises, the incorporation of key enabling technologies, and the introduction of product or process innovations.

Thanks to its participation in the Cities Mission, Prato can accelerate the dynamics of ecological and circular transition through targeted policies aimed at operationally supporting the territorial production system in this transition to climate neutrality, in which a special attention is paid to the involvement of vulnerable groups to ensure a just transition. In fact, in addition to the aforementioned urban forestation measures in areas with the highest risk of environmental and socio-economic vulnerability, the Action Plan provides specific incentives for low-income households, such as facilitating the replacement of obsolete household appliances, and promoting the energy upgrading of public social housing buildings to improve the quality of housing assistance.

Monitoring and joint learning. During the monitoring phase, the Municipality of Prato will focus on assessing the progress and effectiveness of the actions undertaken in achieving climate neutrality goals. Every two years, a comprehensive review will be conducted to assess the progress towards climate neutrality. Special attention will be paid to data analysis and accountability of each stakeholder, thus ensuring that monitoring results in a continuous learning process. It will be crucial to identify early signs in the results that indicate progress in the right direction. The aim of monitoring extends beyond merely measuring the outcomes of actions; it also involves discerning the additional adjustments required for success, which may include modifications in policies, regulations, and behaviors.
In this evaluation process, the Municipality of Prato will employ a range of quantitative indicators to monitor the different actions undertaken. However, it will also value qualitative indicators of change, such as citizens' growing awareness of environmental issues. This approach will help to strengthen a collective understanding of the ongoing transformations and facilitate the transition towards climate neutrality. Through monitoring, there will be a continuous acquisition data and knowledge in relation to the efficacy of the actions implemented and their impact across different urban settings and key areas of emissions.
An adaptive approach to portfolio actions and objectives will also be adopted. We will continuously work to align actions and objectives with the changing urban context and new insights emerging from stakeholders, making changes and improvements where necessary. The implementation strategy will also be frequently updated to adjust the trajectory towards optimal results and an overall positive impact.
Over time, the commitment of the Municipality of Prato could stand as a model and reference point for other municipalities and cities aiming to pursue similar pathways towards climate neutrality.

5 Signatories

Include a list of stakeholders who have committed to help your city achieve its goal to reach climate neutrality by 2030. Detailed commitments and agreements between individuals or groups of stakeholders should be appended to this Commitments document. This list will likely increase over time.

Name of the institution	Sector/Area	Legal form	Name of the responsible person	Position of the responsible person
Prato Province Authority	Local institution	Public authority	Simone Calamai	President
Municipality of Cantagallo	Municipality	Public authority	Guglielmo Bongiorno	Mayor
Municipality of Montemurlo	Municipality	Public authority	Simone Calamai	Mayor
Municipality of Vaiano	Municipality	Public authority	Primo Bosi	Mayor
Municipality of Vernio	Municipality	Public authority	Giovanni Morganti	Mayor
Chamber of Commerce Pistoia-Prato	Business	Public authority	Dalila Mazzi	President
SDS Pratese Area Public Health Company	Health	Public authority	Simone Faggi	President
Alia Servizi Ambientali S.p.A.	Environment	Public company	Nicola Ciolini	Vice President
Consiag Servizi Comuni	Environment	Public company	Filadelfo Spinella	CEO
Consorzio Progetto Acqua SpA	Environment	Public company	Ivo Vignali	President
Edilizia Pubblica Pratese Spa	Social	Public company	Marzia De Marzi	President
Estra spa	Environment	Public company	Francesco Macrì	President
G.I.D.A. Water Purification Plant Management	Environment	Public company	Alessandro Brogi	President
Interporto della Toscana Centrale	Mobility	Public company	Francesco Querci	President
PARSEC Foundation - Natural Science Centre	Environment	Public company	Antonella Fioravanti	President
Prato Hospital - S. Stefano	Health	Public company	Maria Teresa Mechi	Director
Confartigianato Imprese Prato	Business	Business representation organisation	Luca Giusti	President

Name of the institution	Sector/Area	Legal form	Name of the responsible person	Position of the responsible person
Prato Province Authority	Local institution	Public authority	Simone Calamai	President
Municipality of Cantagallo	Municipality	Public authority	Guglielmo Bongiorno	Mayor
Municipality of Montemurlo	Municipality	Public authority	Simone Calamai	Mayor
Confcommercio Pistoia and Prato	Business	Business representation organisation	Gianluca Spampani	President
Confesercenti	Business	Business representation organisation	Stefano Bonfanti	President
Confindustria Toscana Nord	Business	Business representation organisation	Fabia Romagnoli	Vice president
CIA Toscana Centro	Business	Business representation organisation	Sandro Orlandini	President
CNA Toscana Centro	Business	Business representation organisation	Claudio Bettazzi	President
Palazzo delle professioni	Business	Business representation organisation	Marco Dominici	President
Camera del Lavoro CGIL Prato	Trade union	Trade union organisation	Lorenzo Pancini	General secretary
CISL Florence Prato	Trade union	Trade union organisation	Marco Bucci	Confederal secretary
UIL Prato	Trade Union	Trade union	Rodolfo Zanieri	Local coordinator
PIN - Polo Universitario Città di Prato	Higher Education	University	Daniela Toccafondi	President
Metastasio Theatre Foundation of Prato	Culture	Cultural institution	Massimo Bressan	President
Politeama Theatre Foundation	Culture	Cultural institution	Beatrice Magnolfi	President
Prato Textile Museum Foundation	Culture	Cultural institution	Fabia Romagnoli	President
Abitare Toscana srl	Social	Social housing company	Stefano Tossani	Legal representative
Alice Società Cooperativa Sociale	Social	Social cooperative	Gianna Mura	President
AMI Foundation	Social	Association	Claudio Sarti	President

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Municipality of Montemurlo	Municipality	Public authority	Simone Calamai	Mayor
ARCI	Social	Association	Ilaria Testa	President
Cooperativa Pane e Rose onlus	Social	Social cooperative	Tommaso Rindi	President
MCL	Social	Association	Dario Ercoli	President
Save The Children	Social	Association	Paolo Lattanzio	Head of Territorial Development Social Innovation Structure
Opera Santa Rita Foundation	Social	Association	Renza Sanesi	President
UrbanHousingCoop.net	Social	Social housing network	Tancredi Attinà	Legal representative
CAI Prato	Environment	Association	Paola Fanfani	President
Legambiente Prato	Environment	Association	Giacomo Agabio	President
F.I.M.M.G. Toscana	Health	Association	Niccolò Biancalani	Regional secretary
Ordine Provinciale dei Medici Chirurghi e degli Odontoiatri di Prato	Health	Association	Guido Moradei	President
Autolinee Toscane	Mobility	Company	Gianni Bechelli	President
Automobile Club Prato - ACI	Mobility	Association	Federico Mazzoni	President
FIAB onlus, Italian Federation of Friends of the Bicycle	Mobility	Association	Danilo Presentini	President
Conad Prato	Large-scale retail	Company	Tommaso Signorini	Vice president
Colzi Paolo Azienda Agricola	Agriculture	Company	Paolo Colzi	CEO
Gran Prato Association	Agriculture	Association	Paolo Colzi	President