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of local authorities in energy transition



**Unlocking investment in cities:
ELENA-EIB technical
assistance facility**

Project review in five European local authorities

PARIS *Barcelona*
Bristol Brussels-Capital Malmö

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Supported by



Acknowledgement

Foremost, we express our sincere thanks to Mr Gonzales (Transports Metropolitans de Barcelona), Mrs Grosjean (SLRB), Mr Gyarmati (City of Malmö), Mr Le Bel Hermile (Ville de Paris), Mrs Schmidt (Bristol City Council) and Mr Sokal (SLRB) for the precious information and the kind help they provided us with for the preparation of this review. Their input constitutes the core of the contents of this study and the cornerstone of our analysis.

We would also like to thank Mr Bullier and Mr Doubrava (European Commission) for exchanging with us on the contents of the study.

Finally, we wish to thank the Caisse des Dépôts et Consignations for the kind support provided to this work.

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Publication:

June 2015

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Executive summary

Energy Cities prepared a review of projects undertaken in the cities of Paris, Malmö (in association with Lund and Helsingborg), Barcelona, Bristol and Brussels-Capital that received support from the ELENA-EIB facility. The aim of this study is to identify the ways in which technical assistance programmes such as ELENA-EIB can help unlock investment in cities. The projects we reviewed (developed by Energy Cities' members) cover a wide array of sectors, from public building refurbishment to public transport or renewable energy production.

These five projects illustrate how cities can focus on developing capacity in a long-term perspective, looking at the expected benefits of an investment or a support mechanism beyond that of the project itself. Overall, we found that project development assistance mechanisms such as ELENA can be beneficial to trigger investment for climate action in cities. Cities maximise the benefits of such a programme by looking at how their climate-protection actions can generate benefits for the citizens, or how to systematically integrate climate action in other investment projects.

Project development assistance (PDA) affects cities by allowing them to develop a new vision of the way they prepare an investment programme. The search of synergies and the override of silo mentalities were a core element in the projects we reviewed. Indeed, the support provided by the European Union through ELENA-EIB is used by the local authorities to develop a transversal approach to climate action. The grant provided for PDA and the requirements of the ELENA-EIB facility represent an opportunity for local authorities to set up a new strategy regarding energy efficiency and renewable energy actions. It can be the necessary push for cities and local authorities to change the way they plan their investments, and develop projects to achieve their climate objectives. Besides, the grant is used for building long-term capacity in the development of investment programmes. We notably underline the positive effect of project development assistance on the development of innovative organisational models within city administration and in relation to external partners.

However, in a context of tight public budgets in the aftermath of the economic crisis, unlocking the funds required to undertake new projects may prove difficult, notably for municipalities constrained by debt. While project development assistance provides significant benefits as regards organisational aspects, and while it is a valuable "quality label" to collect money, municipalities that are confronted to issues of debt regulations or investment expenses scattered over time still may have a hard time mobilising funds.

Introduction

European project development assistance programmes

Under the Intelligent Energy Europe programme, the European Commission set up a wide array of facilities of technical or project development assistance (PDA) for renewable energy and energy efficiency investments targeting different types of players. Public authorities, and notably cities, are a key target group. The Juncker Investment Plan also offers a strong focus on project development assistance.

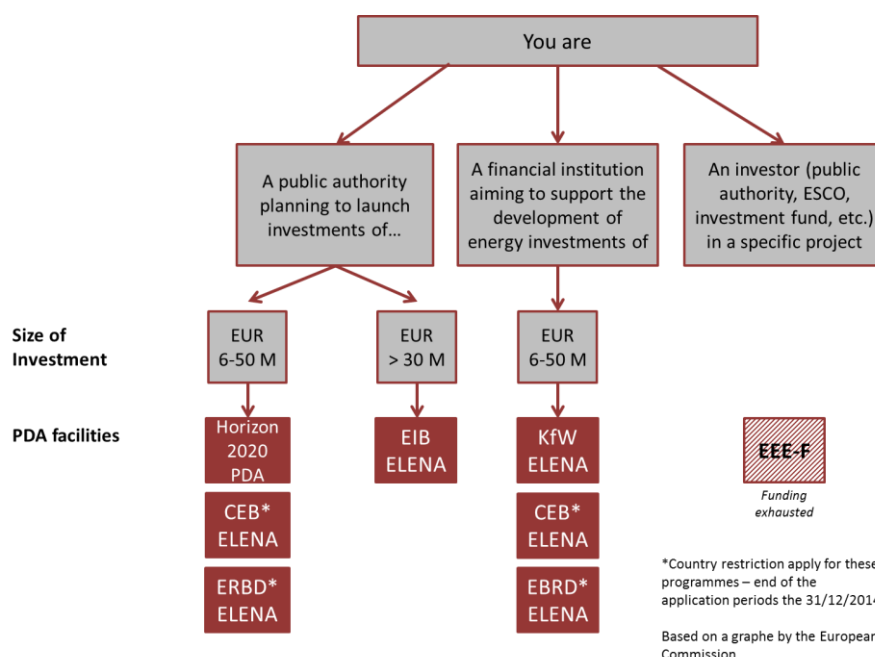
Unlike more traditional forms of financial support, project development assistance programmes do not typically provide their beneficiaries with funding for investment. Instead, they provide grants for a set of specific eligible costs for project development and management. These can include the creation of project manager positions, hiring of technical, financial and legal experts, feasibility and market studies, programme structuring, energy audits, tendering procedure preparation and so on. PDA programmes aim at easing the start of an investment programme by reducing the costs of its early preparatory phases.

As a condition to the attribution of a project development assistance or technical assistance subsidy, the European Commission requires that the total invested amount of money be 15 to 20 times higher than the funds granted under the ELENA facility.

For the European Union, this is a way to unlock large amounts of private investment while committing smaller amounts of European public money. For the benefitting public authorities, such mechanisms represent an opportunity to develop more innovative and ambitious investment programmes than they would have otherwise, thanks to the possibility of financing a team working full-time on the development of a large investment programme – as well as other project development expenditures.

The PDA programmes are however not limited to the attribution of a subsidy to beneficiaries. Beyond the grant component, the institutions charged with the PDA management provide their financial expertise to the beneficiaries. They can greatly increase the chances of a project to succeed by making sure that it is investment-worthy. This type of support scheme proceeds in a bottom-up manner. Local players are encouraged to exploit their territorial resources and design tailor-made investment programmes. As the underlying objective of PDA programmes is to encourage the replication of successful projects in other local authorities through experience sharing (which is often a contractual requirement for the cities), they have a keen interest in supporting innovative solutions in order to prove their scalability.

*European Project Development Assistance Programmes
(Energy Cities, based on a graph prepared by the European Commission)*



European Local Energy Assistance (ELENA) managed by the European Investment Bank

The ELENA programme set up by the European Commission and managed by the European Investment Bank (EIB) is the very first European technical assistance facility supporting large investment projects which is led by local authorities. The ELENA facility was created in 2009 as a response of the EU institutions to the Covenant of Mayors¹ movement, that mobilised at that time hundreds of mayors voluntarily committed to achieving the EU 3x20% energy and climate objectives. The facility is funded under the Intelligent Energy Europe programme, with an initial budget of EUR 40 million. So far the EIB-ELENA facility has provided EUR 70 million to around 40 projects, which should yield EUR 3.8 billion as city-led investment.

The eligibility requirements² for obtaining ELENA-EIB technical assistance are:

- Identified investment programme contributing to the 3x20 objectives of the European Commission in terms of energy efficiency, renewable energy production or greenhouse gas reduction;
- Investment programme of more than EUR 35 million, according to a condition of additionality of the investment;
- Leverage ratio of at least 20 between the total investment costs of the investment programme supported and the total cost of the ELENA grant assistance.

Ideally, local authorities requesting an ELENA grant should also be signatory of the Covenant of Mayors, as the Energy Intelligent Europe programme supports the initiative. Besides, smaller projects can be integrated in a larger investment programme that meets the EIB requirements if it significantly improves its energy efficiency and renewable energy production prospects.

Besides, investment programmes have to focus on the following sectors:

- Public and private buildings (however commercial buildings are excluded);
- Integration of renewable energy sources (RES) into the built environment;
- District heating expansion, retrofitting to renewable energy sources and/or development, as well as cogeneration;
- Urban transport to increase the energy efficiency and decrease the GHG emissions of the city's transport sector;
- Local infrastructure such as smart grids.

Local authorities can benefit from the grant funding covering up to 90% of the technical support cost needed to prepare, implement and finance the investment programme.

Energy Cities' review of ELENA-EIB projects implemented by five member cities

As European technical assistance programmes can only support a limited number of beneficiaries, it is important that the latter share their knowledge and innovative solutions with other cities around Europe, thus increasing even more the impact of the EU funds. Energy Cities - the European association of cities in energy transition - therefore decided to review and disseminate innovative financial and organisational models that were developed and implemented by five of its members that are beneficiaries of such programmes. We also wanted to assess and highlight the benefits of support schemes such as ELENA-EIB by discussing with our members their experiences with PDA implementation and cooperation with the European Investment Bank as a PDA manager.

Specifically, we decided to focus on the ELENA-EIB facility since it is the main facility for project development assistance in terms of sponsored projects and mobilised investment. This choice was also motivated by the increasingly important role that the EIB will play in the matter as it shall manage the massive European Investment Advisory Hub (EIAH), set up as part of the Juncker Investment Plan³.

Out of 39 beneficiaries of the ELENA-EIB technical assistance, 6 are members of Energy Cities: Barcelona (Spain), Bristol (United-Kingdom), Brussels-Capital Region (Belgium), Malmö (Sweden) and Paris (France), as

¹ www.eumayors.eu

² For further information on the eligibility criteria to the ELENA-EIB facility, see: http://www.eib.org/attachments/documents/elena_faq_en.pdf

³ The EIAH "should provide guidance on delivering quality projects and investments, using EU funds more efficiently, in particular through reinforced use of financial instruments, and improving access to finance" (EIB).

well as Vila Nova de Gaia (Portugal). Overall, local authorities of the Energy Cities network received EUR 11,150,994 under the ELENA-EIB facility, in order to leverage some EUR 872 million.

This document presents five case studies resulting from detailed interviews with project managers responsible for ELENA-EIB implementation in local authorities. The programmes are presented in this review in the chronological order of the signature of their ELENA project:

- **Paris**⁴: retrofitting public school buildings through energy performance contracting (2010);
- **Barcelona ELECTROBUS**⁵: retrofitting of buses into hybrid vehicles and redrawing of the city's urban transport network (2011);
- Tramways in Skåne⁶, with the cities of **Malmö**, Lund and Helsingborg: development of three tramway networks thanks to joint procurement and experience-sharing (2011);
- **Bristol** Retrofitting – Innovative Technologies for Everyone⁷: establishment of a municipal energy company to transform the city's energy sector (2012);
- **Brussels-Capital VAMOS**⁸: mainstreaming renewable energy production in public housing projects (2012).

Each case study is structured around seven axes:

1. **Business model** - and financing mechanisms used to mobilise investment;
2. **Organisation & Partnerships** - focusing on the internal organisational structure of the team of experts implementing the investment programme and relevant external partners and organisations;
3. **Beneficiaries** - assessing the impact of the investment programme on the stakeholders;
4. **Results** - assessing the tangible results as well as success factors or challenges that may have been encountered during the implementation of the project;
5. **Promotion** - identifying the extent to which the local authorities communicate on and promote these programmes;
6. **ELENA-EIB technical assistance** - relation with the European Investment Bank, assessing the level of collaboration between the EIB and the beneficiary cities;
7. **Takeaways for other public authorities** - underlining the key recommendations for cities interested in undertaking similar initiatives.

Main findings: Benefits and impact of ELENA-EIB

The projects that subscribed to ELENA-EIB in five of our member local authorities give an interesting glimpse of cities' capacity to innovate and design an investment plan. Indeed, they have a diversified portfolio of projects, some of which were initiated in the early phases of the programme. For instance, Paris' project started in 2010, and others were only recently signed. Moreover, the projects encompass different sectors of climate action from public buildings retrofitting to renewable energy production or urban transportation.

We were notably interested in exploring the possibilities offered by the ELENA programme in terms of developing innovative financing schemes. We found out, thanks to our members' feedback on their experience of collaboration with the European Investment Bank, that the ELENA-EIB assistance had strong positive effects in terms of:

- Internal organisation with trans-sectorial approach: setting up a team designing an investment programme for energy efficiency and renewable energy production, often provides the opportunity to have a transversal approach to the public authority's energy and climate action. We found out that support under ELENA-EIB can provide public authorities with the opportunity to think "outside the box" of their traditional approach to investment projects with the aim to efficiently integrate – and not merely add – energy efficiency and renewable energy production into their programmes.
- Internal capacities and skills: preparing and managing vast investment programmes and innovative financing schemes requires building internal capacity that will stay within the municipality on the long term.

⁴ http://www.eib.org/attachments/documents/paris_project_factsheet_en.pdf

⁵ http://www.eib.org/attachments/documents/electrobus_project_factsheet_en.pdf

⁶ http://www.eib.org/attachments/documents/spis_project_factsheet_en.pdf

⁷ http://www.eib.org/attachments/documents/brite_project_factsheet_en.pdf

⁸ http://www.eib.org/attachments/documents/vamos_project_factsheet_en.pdf

- Political support: ELENA projects give political momentum to local climate action also thanks to the EIB support. Indeed, the support provided by the European Investment Bank is a valuable label for the teams in charge of the projects to obtain investment or defend the value of the project to their local authority. Besides, the monitoring provides a precise time-scale that raises accountability for the local authorities subscribing to ELENA. This further reinforces the public authority in the implementation of these projects.

Overall, we found that our members have a very pragmatic approach to the ELENA mechanism and use it thoroughly to get benefits on the long term. In Brussels-Capital for instance, the *Société du Logement de la Région Bruxelles-Capitale* undertook the development of a pole of expertise in renewable energy production in public housing that is expected to keep on intervening on the public authority's projects well after the end of the period of the ELENA support.

The main finding of this review is that the ELENA programme produces great results in terms of new organisational model. The grant for project development assistance allows local authorities to best exploit their capacities, develop new ones, and rethink their services to have an optimal approach to climate action. We found that this facility can provide the resources necessary for the cities to change the way they conceive climate action. Although all the programmes we have reviewed here embody this aspect, the BRITE programme in Bristol arguably is the most significant in this regard. Bristol City Council indeed uses EIB-ELENA to leverage a dramatic change of its energy sector as a whole, targeting energy poverty, energy efficiency, ownership of the energy system and renewable energy production.

Regarding the interaction between the European Investment Bank and the local authorities, we found that the Bank developed an understanding of the cities' and public authorities' imperatives and constraints while supporting them. Indeed, although the projects undertaken at the creation of ELENA may have experienced a form of rigidity in their interaction with the Bank, our exchange with the managers of more recent programmes have quite an enthusiastic opinion on the assistance provided by the EIB. The Bank notably provided helpful comments in the early phases of the setting of the ELENA projects, and later on proved to adapt rather well at the specific needs of cities, granting delays or extensions when necessary to the beneficiaries facing unforeseen difficulties – the most important of which being the impact of the economic slowdown on the local authorities' capacity for action.

This review also allowed us to identify some major challenges for cities undertaking investments in greenhouse gas emission reduction. The local authorities expressed their difficulties in mobilising investment for these actions – despite the support of ELENA - due to the economic crisis and its impact on public budgets. As a result, project implementation was often delayed. Besides, regulation on instruments such as energy performance contracting (EPC) may be a strong deterrent to their use. The typical motivation of a local authority to use a complex tool such as EPC is the possibility to account for energy efficiency actions off their balance sheet. This is an imperative that is increasingly important for a number of municipalities that are simultaneously facing increasing energy expenditure, growing engagement for greenhouse gases reduction and budget cuts. Yet, local authorities are often forced to account these contracts as debt in their balance sheets, thus EPC appear much less attractive. In the context of this study, this regulatory issue around energy performance contracting played a role in Paris' decision to change the contractual organisation of its school retrofitting from EPCs to conception, realisation and maintenance contracts. Moreover, barriers created by other services or coming from other levels of governance can also have dire effects on the viability of a programme. For instance, the programme "Tramways" in Skåne, in which Malmö participates, is delayed because of the time-lag between the Swedish government's announcement that it would support local urban transport and the actual delivery of the funds.

PARIS: Refurbishment of municipal schools via Energy Performance Contracting

Population: 2,2 million inhabitants	Project signed on 15 December 2010	Grant from ELENA-EIB: EUR 1,377,000
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In its 2007 Climate Plan, the city of Paris commits to reduce energy consumption and GHG emissions in public buildings by 30% by 2020. Accounting for 20% of the municipal building stock and providing one of the best cost-benefit ratios in terms of energy savings, schools were chosen to benefit from a vast retrofitting programme.

In the framework of this programme, organised in the form of Energy Performance Contracts, 600 kindergartens and elementary schools are to be refurbished in successive lots that allow for learning and iteration. Beyond its climate action goals, the project aims at achieving financial savings, notably thanks to contractual guarantees related to final energy savings. The project benefits from the European ELENA-EIB technical assistance.

1. Business model: How the programme is implemented

School retrofitting programme:

- Objectives: **30% of energy savings** and a 30% CO₂-emission reduction in public buildings by 2020, compared to 2004⁹.
- Schools are the most important category of the municipal building stock with 660 out of 2,500 buildings, representing over 20% of the municipal building stock. They yield one of the best cost-benefit ratios in terms of energy savings. Only some **600 schools** are however included in the retrofitting scheme, the others being either in need of deeper renovations or already show good energy performance.
- The 600 schools are divided in lots and are thus retrofitted in several phases. This allows learning and iteration throughout the process. The overall expected investment to be raised in the context of the technical assistance provided by the EIB (which covers 300 schools) for this project amounts to **EUR 180 million**, which corresponds to a leverage ratio of 131 for the ELENA grant awarded to the city of Paris – much higher than the minimal ratio of 20 required by the EIB.
- The retrofitting programme has been implemented through **Energy Performance Contracting¹⁰ (EPC)**. This type of contract provides a guarantee on the final energy savings achieved and includes actions that vary from one school to another (from installing thermostats to heavy insulation).

Table 1.1: A repartition of Paris' municipal schools per energy performance label (source: Paris City Council)

Etiquette	A	B	C-	C+	D-	D+	E	F	G
Consommation énergétique En kWh _{EP} /m ² /an	< 50	51 – 110	111 – 160	161 - 210	211 – 280	281 - 350	351 – 540	541 – 750	> 751
Proportion d'écoles à Paris	0%	3%	19%	27%	34%	9%	6%	2%	0%

⁹ Set by the *Plan Climat de la Ville de Paris*, 2007

¹⁰ Energy Performance Contracting is a financing tool set by the directive CE 2006/32 of the 5 April 2006, which aims at easing energy efficiency actions for local authorities. Under an energy performance contract, "an external organisation (ESCO) implements a project to deliver energy efficiency, or a renewable energy project, and uses the stream of income from the cost savings, or the renewable energy produced, to repay the costs of the project, including the costs of the investment."

Table 1.2: The first two Energy Performance Contracts organised by the city of Paris as of December 2014

CPPE - “Energy Performance Partnership Contract”	CREM - “Conception, Implementation, Exploitation and Maintenance”
<ul style="list-style-type: none"> - Type of contract: <i>Contrat de Partenariat et de Performance Energétique</i>, Energy Performance Public-Private Partnership contract - Signed in 2011 for a duration of 20 years - 1st lot: 100 schools (representative sample of all schools) - Initial refurbishment phase: EUR 34 million - Total cost: EUR 80million over 20 years. 	<ul style="list-style-type: none"> - Type of contract: <i>Marché Public Global</i>¹¹ (global procurement contract) - To be signed at the beginning of 2016 - 2nd lot: 140 schools - Total investment: <i>not known at the time this document was prepared.</i>
<p>Financing:</p> <ul style="list-style-type: none"> - In this contractual form, the contractor, NOV’ECOLES Paris, pre-finances the retrofitting of the buildings to deliver a minimum 30% reduction in energy savings and emissions. - Services provided by NOV’ECOLES include: <ul style="list-style-type: none"> o Feasibility studies and conception o Improvement of the building envelop o Modernisation of the heating system o Installation of RES production units when suitable - Upon completion of the initial refurbishment phase, the municipality pays a quarterly license fee, amounting to a yearly EUR 4.15 million payment to NOV’ECOLES Paris. - The penalty in case these savings are not delivered is equal to the additional costs for the city in terms of energy consumption (compared to what they would be if the savings were delivered), and of EUR 15 per tonne of CO₂ emitted beyond the 30% emission reduction threshold. 	<p>Financing:</p> <ul style="list-style-type: none"> - The municipality is to pay upfront the investment needed to undertake the retrofitting work. - The money comes from the global municipal budget. There was no specific borrowing campaign for the CREM contract. - The contractor must get financial guarantees on the behalf of Paris municipality in case of underperformance.
<p>External resources mobilised: <i>Marchés publics d’assistance à personne publique:</i> legal, financial and technical assistance (during the consultation phase and the first two years).</p>	<p>External resources mobilised: <i>Marché public d’assistance à la maîtrise d’ouvrage:</i> legal and technical assistance (during the consultation phase).</p>

A third EPC will be set up for the remaining 60 schools.

The first Energy Performance Contract, designated as CPPE, was signed in 2011, and takes the form of a Public-Private Partnership. It regards the first lot of 100 schools. The second one (CREM), which should be signed early 2016, takes the form of a global procurement contract, a tool that was not available in the frame of the French legislation back in 2011, when the CPPE was signed.

If for the CPPE the private contractor brought the initial capital, in the case of CREM, it is the city that pays the investment upfront. However, the contracts include the guarantees on delivered energy savings. The reasons behind the switch from one contractual form to another are that the private pre-financing of the actions cannot be presented as an asset in terms of accounting¹². Besides, financial engineering is more complex for contracts such as CPPE.

¹¹ This contractual form allows the public authority to issue a single public procurement contract for all the steps (or less) to implement energy efficiency actions.

¹² Due to the *Arrêté du 16 décembre 2010* which states that the sum owed to the contractor by the public authority must be listed as debt in its books, decreasing the accounting benefit the Partnership Contract previously had in a context of tight public finances.
<http://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000023274344>

For the CPPE contract, which is the only one tested so far, the process goes as follows:

- **Conception phase:** energy audits in schools, identification of the needed measures, etc.
- **Realisation phase:** the first lot finalised in 2012 regarded a representative sample of 45 schools and aimed at increasing their energy efficiency by at least 30%. Their energy consumption was reduced by about 33% for an investment of EUR 14.5 million. There are not definitive results for all the 100 schools yet.
- **Exploitation and Maintenance phase:** the private entity leading the works has a contractual obligation to organise awareness-raising campaigns for employees in every retrofitted school on the issue of energy savings (a measure designed to avoid rebound effect). During this phase, the contractor is entitled to maintain the installed equipment so that energy savings are actually delivered.

For the second contract, it is likely that the implementation process will slightly differ from the first one, notably because of the lessons learnt during the first phase of the programme. In the consultation phase for example, the city is now doing more to take into account the feedback from the school users.

Figure 1.1: Organisational chart of the CPPE contract (Energy Cities)

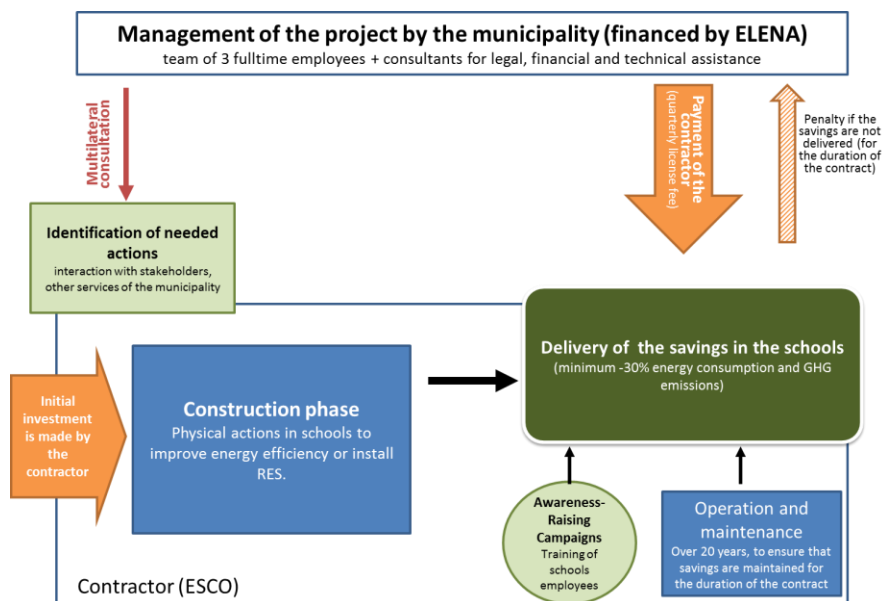
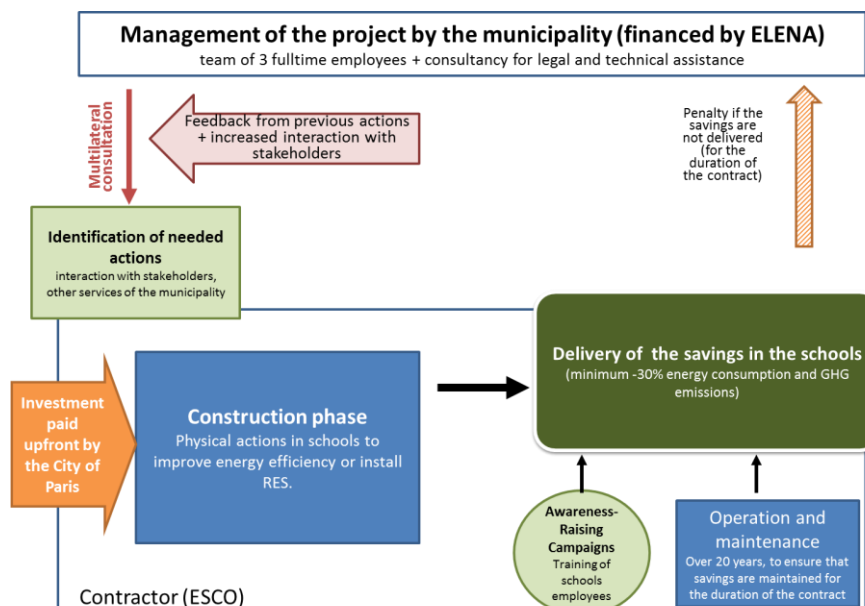


Figure 1.2: Organisational chart of the CREM Contract (Energy Cities)



2. Organisation & partnerships

The implementation of the programme is organised around a project management team within Paris municipality (*Mairie de Paris*), composed of three full-time municipal civil servants. This team is in charge of liaising with the city's external partners which include:

- The ESCO that implements the retrofitting programme - NOV'ECOLES Paris was specifically created to serve the purpose of the project and its shareholders are the *Caisse des Dépôts et Consignations*, EDF Optimal Solution and Atlante Gestion. The conception, implementation and exploitation phases of the retrofitting of the schools is made by EDF Optimal Solution and the local business it is associated with (small and medium local enterprises develop 34% of the actions implemented within this project);
- The European Investment Bank that provides the ELENA technical assistance;
- Schools, to collect their feedback (notably teachers and parents' associations).

Internally, the team also deals with different partners and municipal services such as:

- "*Mairies d'Arrondissement*" (City Boroughs Councils),
- Financial department,
- Education department, usually in charge of school-related matters.

This programme contributed to the **development of a cross-sectorial vision of energy efficiency actions within the municipality**. The experience acquired during the first phase of the programme allowed for overcoming the strict division of tasks and the silo mentality that prevailed in the internal organisation of the city.

Improved knowledge on energy efficiency issues determines the actions to be initiated under the following Energy Performance Contracts, especially better consideration of the input from the schools (e.g. accounting winter and summer comfort will lead to improving insulation).

As regards replicability, the city now has the technical knowledge to independently develop its own energy efficiency projects and assist other cities in doing so.

3. Beneficiaries

Table 3.1: Beneficiaries of the CPPE contract

Players	Impact of the programme
Municipality	Financial savings in the form of reduced operational costs related to lower energy bills for municipal school buildings.
Schools	Schools benefit from improved infrastructure and better heating systems but not financial savings, as they do not have their own budget.
School employees	Experience disruptions during the construction phase. They may also have to change their behaviour once the actions are implemented (for instance monitoring thermostats). In a few schools, the users complained about some measures (notably when reducing inefficiencies such as excessive heating of the premises during winter time).
Pupils	They may experience improved school infrastructure. The works are carried out during the holiday period, which limits the negative consequences for the pupils (and employees).

4. Results

- The initial phase of energy retrofitting actions involving 45 schools in 2012 resulted in average in **33% of energy savings**.
- There is not definitive result yet as regards the savings obtained for the 100 schools under the CPPE contract but they are expected to be of about **10,000 MWh and 2,300 tCO₂**.
- Very few complaints were expressed by the first 45 schools, which can be seen as a sign of success.
- Within the CPPE, the city expects to save **EUR 750,000/year** (after the payment of the contractor) which means an expected profit of **EUR 15 million** over 20 years.

5. Promotion

- Promotional notably activities included a introducing the programme during conferences or seminars and inviting journalists to schools during the early stages of the first Energy Performance Contract.
- 250 awareness-raising sessions targeting school children are to be carried out every year in order to make them more receptive to energy-saving issues.

6. ELENA-EIB technical assistance

The city has been benefitting from an ELENA-EIB technical assistance – a grant of EUR 1.37 million - covering 90% of the operational costs which include:

- Internal team - three full-time municipal agents in newly-created jobs¹³;
- External consultancy:
 - CPPE - public procurement for legal, financial and technical assistance (consultation phase and first two years);
 - CREM - legal and technical assistance in the CREM (consultation phase).

For a EUR 180 million project, this subsidy only represents a small share of total costs (the municipality expects a leverage factor of 131 from the ELENA grant). The City of Paris would therefore most likely have conducted the retrofitting programme without the ELENA support. However, in a context of tight public finances, the funding provided by the EIB proved helpful.

The process of applying for the subsidy was not so easy, notably because Paris was among the first cities to apply to ELENA. Some difficulties arose during the translation of legal documents and led to different interpretations by the city and the EIB (for instance regarding eligible expenditures). The relative novelty of the ELENA tool for both parties – the city and the EIB – caused some misunderstandings which progressively disappeared as the learning process went on.

Overall, the experience of the Paris with ELENA and the EIB is positive. Indeed, the management of the technical assistance (monitoring reports, interaction with the EIB) does not consume much the city's resources. Besides, the EIB proposed two *addenda* that allowed Paris to get an extension of the grant contract, showing flexibility and a will to actively assist municipalities.

7. Key takeaways for other public authorities

- It is important to develop a **transversal approach** to energy-saving action. Cooperation between municipal services is crucial.
- **Involving all players** having a stake in the programme facilitates its implementation and makes actions more in line with the respective priorities of the different parties.
- Municipalities should identify which forms of financing **best suit their purpose** and favour actions that will **strengthen learning**.

Contact - City of Paris

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¹³ These are the conditions for a cost to be eligible for funding from ELENA.

BARCELONA: ELECTROBUS - Upgrading the urban transport system

Population: 1.6 million inhabitants	Project signed on 8 April 2011	Grant from ELENA-EIB: EUR 1,921,000
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The city of Barcelona is at the heart of a densely populated metropolitan area between mountains and sea. With 1.6 million inhabitants, it is the core of the largest metropolitan area of the Mediterranean coast of five million inhabitants. It is also a key economic area in Spain. Barcelona is committed to climate change action: the city has set itself the objective to reduce its CO₂ emissions by 23% by 2020 on the basis of its Sustainable Energy Action Plan (SEAP). One key action aims at decarbonising urban transportation, which is what the ELECTROBUS programme is about.

1. Business model: How the programme is implemented

ELECTROBUS is led by the city's public transport authority TMB (Transports Metropolitans de Barcelona). The goal is to convert the city's buses into hybrid vehicles and to redesign the entire urban transport network.

TMB started the ELECTROBUS programme thanks to funding from the ELENA-EIB facility. The programme is expected to allow for energy savings that amount to 61.4 GWh over the duration of the project and an annual CO₂ reduction of 16,400 t. TMB has planned to revamp its bus network to increase its efficiency and the service quality. The programme is not driven by financial benefits. TMB does not count on making profits during the 20-year 'life-cycle' of the project.

The ELECTROBUS programme consists of two strands of action:

- The conversion of the bus fleet into hybrid vehicles and the purchase of new commercial hybrid vehicles;
- The redesign of the bus network for higher efficiency and clarity.

Of these two complementary sets of action, developing the hybrid bus fleet will require the biggest share of the EUR 164 million expected investment over the 20 years of the programme. The EUR 35-40 million of investment mobilised between 2011 and 2015 are also primarily dedicated to the conversion of the bus fleet.

Strand 1: Converting buses

Converting existing buses into hybrid vehicles is expected to yield energy and CO₂ savings of 25-30% per vehicle. The engineering part of the program - designing the buses' conversion process - is made by TMB as part of the project. It is one of the innovative aspects of ELECTROBUS that can be replicated in other cities:

- TMB has an objective of deploying 230 hybrid and electric buses between 2010 and 2015;
- As part of this process, 40 CNG¹⁴ buses will be converted into hybrids. It notably focuses on the development of the engineering process for converting CNG buses and the physical conversion of the units.

However, the cost of retrofitting a single bus unit is high and requires subsidy from the Spanish government: EUR 50,000 are required per unit to get return on investment over the 10 years lifespan¹⁵ of each unit. TMB cannot invest in a single unit if it cannot expect to earn back its investment on a life-cycle cost basis.

As a public transport authority, TMB must respect strict rules for financing its operations. As such, 50% of its budget must come from the sales of travel tickets, and further 50% is subsidised by public authorities such as the city council or regional and national government (e.g. by the *Instituto para la Diversificación y el Ahorro de la Energía*¹⁶). In addition, due to the economic crisis, Spanish public authorities face difficulties in accessing financing and TMB cannot access loans for investing. These factors impeded the implementation of ELECTROBUS. TMB had to generate cash out of its budget, which delayed the delivery of the project.

¹⁴ CNG: Compressed natural gas.

¹⁵ For security reasons, buses typically have a 12-15 years lifespan. Typically, units that undergo conversion into hybrid typically are 2 or 3 years old, and thus are expected to stay in use for another 10 years.

¹⁶ <http://www.idae.es/>



Retrofitted CNG bus transformed into a hybrid vehicle (picture: courtesy of TMB)

Strand 2: A new bus network

The redesign of Barcelona’s bus network aims at making the bus system more user-friendly and thus easing and increasing the use of public transport:

- The new routes of the network cover the same total distance as before, but they are more evenly distributed over the metropolitan area;
- Special efforts are made to make the new network easier to understand, both for citizens and tourists;
- The new network should allow passengers to change buses maximum once during most of their trips;
- Buses will not run the same route twice (notably thanks to a reduction in redundant routes between the centre and the outskirts) and linkages between peripheral areas will be increased.



Map of the old bus network in Barcelona (Courtesy of TMB)

The result is a simpler bus network made of orthogonal lanes¹⁷. The new network is composed of 28 routes of three different kinds:

- 17 sea-mountain routes that run perpendicular to the sea front,
- 8 parallel-to-the-sea routes,
- 3 diagonal routes that run through large avenues that do not correspond to the orthogonal scheme.

¹⁷ For more information on Barcelona’s orthogonal bus network: www.tmb.cat/en/nova-xarxa-de-bus



Map of the "Orthogonal routes" bus network in Barcelona (Courtesy of TMB)

2. Organisation & partnerships

Behind the ELECTROBUS project is a team of four employees (technicians and engineers) which is financed via the ELENA grant. It manages the retrofitting of the buses and the revamping of the bus network.

This team closely cooperates with other TMB services such as the unit in charge of other bus conversion programs (ten engineers). Through the cooperation between different TMB units, the learning process and the benefits of the ELENA programme are shared across the company. It also allows TMB to develop an extremely robust expertise on bus retrofitting for both diesel and CNG engines.

To undertake the physical transformation of the CNG buses into hybrid vehicles, TMB worked with several partners. It built on the territorial resources, in particular the broad expertise in car manufacturing of the Barcelona region. TMB was thus assisted by a local engineering firm, Gesmon, during the design process. The physical transformation was made by local independent repair shops.

For the network redesign, *Transports Metropolitans de Barcelona* benefited from the support of the city council. The council saw this project as a chance to make its Covenant of Mayors commitments a reality. The municipal mobility department provided support to the redesign of the lines. Previous technical studies were provided by the technical centre of Barcelona University. The municipality also provided financial support for adapting the urban infrastructure to the newly designed network. It notably helped finance the changes in bus stops or the ground-marking of bus lines.

3. Beneficiaries

Players	Impact of the programme
Citizens, passengers	<ul style="list-style-type: none"> - Easier-to-use network - More comfortable buses and more convenient routes (which have been optimised to fit their purpose of public transportation) - Less noise around the new hybrid buses
<i>Transports Metropolitans de Barcelona</i> (bus operator)	<ul style="list-style-type: none"> - Improvement in the service quality - A new expertise in bus retrofitting that can be exported to other cities - Reduced greenhouse gas emissions and energy consumption
Municipality of Barcelona	<ul style="list-style-type: none"> - The implementation of a project listed in the Sustainable Energy Action Plan of Barcelona - A new organisational model for Barcelona's bus network with the potential to be exported to other cities - Improvement of the city's image: the city is more attractive to citizens and foreigners

4. Results

The ELECTROBUS programme was set up in difficult economic times. The economic crisis of 2008 and its consequences on Spain's economy delayed the project implementation, as TMB was not able to trigger the investment as planned. TMB was however granted a 1-year programme extension by the EIB. Even though the project was not quite scaled up in 2015, the Barcelona City Council provided the necessary political support. The political commitment of the city to the Covenant of Mayors gave good reasons to carry out this action which is in line with Barcelona's Sustainable Energy Action Plan¹⁸.

Some preliminary results:

- For the year 2014, there is an average **26% reduction in GHG emissions and energy savings** thanks to the retrofitting of the bus fleet. This result fits with the forecast made for the ELENA application.
- **13 out of the 28 lines** of the new orthogonal network have been deployed in the metropolitan area. They proved to be more satisfying for users than those of the old network. According to a survey conducted during the early phase of the network deployment, passenger satisfaction was rated considerably higher than with the old network.

5. Promotion

Promotional activities differed significantly between the two action modules of the project:

- Retrofitting the buses into hybrids was rather scarcely promoted with press releases sent out whenever a new lot of retrofitted buses were put into circulation. The goal was to inform citizens of where TMB is investing public money.
- The promotion of the new network was much stronger. Indeed, all travellers needed to be aware of the changes to ensure a smooth transition. Citizens were informed about the new bus lines through the press, TV, radio, etc.

6. ELENA-EIB technical assistance

The ELENA grant awarded by the European Investment Bank to *Transports Metropolitans of Barcelona* for the ELECTROBUS project was of great help for the public bus operator. Although the company might have been able to carry out this programme with other means, the EUR 1.9 million grant was crucial to bring the project forward. Notably, the EIB's seal of approval made it much easier to convince corporate directors and political leaders of the project.

The cooperation between TMB and the EIB was productive. Although the EIB did not intervene in the contents or the objectives of the project, it did provide some helpful insight. In the preparatory phase of the project, the EIB experts helped TMB draft the project and provided them with advice on the organisation. Besides, the EIB also granted an extension when it became clear that the programme could not be completed on time due to the economic crisis in Spain.

7. Key takeaways for other public authorities

- The **economic crisis** had severe consequences on the project implementation.
- ELECTROBUS was well incorporated within TMB's existing hybrid programme and helped create **significant synergies between units**.
- Beyond the technological aspects, the ELECTROBUS programme shows how the public transport authority can **influence citizens** to opt for the bus when it offers a transport service which is **more adapted to their needs**.

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¹⁸ www.eumayors.eu

MALMÖ: Spårvagnar i Skåne - Improving urban transport by developing synergies between local authorities

Population: Malmö 283,000 inhabitants Lund 83, 00 inhabitants Helsingborg 97,000 inhabitants	Project signed on 6 May 2011	Grant from ELENA-EIB: EUR 2,970,472
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The city of Malmö is regularly cited as exemplary in terms of climate action: it aims at becoming a “leading climate city” at global level. Malmö is part of a dynamic area, at the crossroad between Denmark and the rest of Sweden. In 2012, the city engaged in the Energy Cities network, joined forces with two other municipalities of the Skåne region - Lund and Helsingborg - to develop tramway networks. This was the beginning of the project, named *Spårvagnar i Skåne* (SPIS or Tramways in Skåne).

1. Business model: How the programme is implemented

Spårvagnar i Skåne aims at introducing tramway networks in the cities of Malmö, Lund and Helsingborg. The goal of this initiative is to reduce car traffic and subsequently to reduce greenhouse gas emissions from the transport sector. As Sweden’s electricity mix is largely decarbonised¹⁹, the tramway is a very low-carbon mode of transportation. The three cities of the Skåne region expect to have reached overall savings of 25,000 tonnes of CO₂/year and of 82,000 MWh/year at the end of the SPIS project.

Table 1.1: The tramway networks infrastructure of SPIS

	Malmö	Lund	Helsingborg
Tramway network	- 2 lines - Length: respectively 10.8 km and 9.6 km, for a total of 18.9 km (part of the lines are shared) - Total number of stops: 35 - 23 new trams will be procured	- 1 line - Length: 9.5 km - Total number of stops: 13 - 11 new trams will be procured	- 1 line - Length: 7 km - Total number of stops: 9 - 8 new trams will be procured
Expected investment in infrastructure	- EUR 170 million	- EUR 60 million	- EUR 80 million
Tramways (rolling stock)	EUR 110 million for 42 tramways		
Expected start (at the inception of the project)	2016	2014	2018
CO ₂ and energy savings (2020)	- 14,602 tCO ₂ /year - 45,685 MWh/year	- 5,412 tCO ₂ /year - 17,635 MWh/year	- 6,297 tCO ₂ /year - 18,806 MWh/year

The overall investment for the three tram networks is estimated at EUR 421 million (including the infrastructure work in the three cities and procurement of the rolling stock). **In the framework of the ELENA-EIB support scheme, between 2012 and 2015, the planned investment amounts to EUR 170.5 million.** This represents a leverage factor of 57 compared to the EUR 2.97-million grant from the ELENA-EIB facility.

The grant pays the purchase of rolling stock and the new infrastructure for Lund, the first of three cities:

- Procurement of 42 trams by the Region Skåne: EUR 110 million - Delivery of 11 units for Lund in 2014²⁰, 23 units of Malmö in 2016, 8 units for Helsingborg in 2018;
- Building the tramway infrastructure in the city of Lund: EUR 60.5 million.

¹⁹ According to the International Energy Agency, the electricity generated in Sweden came at 44% from hydroelectricity, 40.5% from nuclear, 8.5% from biofuels/waste, 4% from wind and 2.9% from fossil fuels (*Energy Policy of IEA Countries: Sweden, 2013*)

²⁰ This corresponds to the initial provisions of the project, and does not include eventual delays.

The rolling stock is procured by the regional authority of Skåne, which is in charge of public transportation. However the cities take part in the selection of the vehicles. Choosing the appropriate tramway model means assessing what equipment is most relevant to the specificities of each city (in terms of costs and of durability of the rolling stock). It also means maximising the synergies, especially in terms of cost per unit. Starting the production of a tram unit is very costly (around EUR 10 million), which leads to significant economies of scale when doing joint procurement.

A Public-Private Partnership and a loan from the European Investment Bank were amongst the solutions considered for the financing of the rolling stock.

The public works needed to put the network infrastructure in place is to be financed by the cities. Since the Swedish government announced its will to support local public transport systems, SPIS organised its financing scheme in view of obtaining a governmental grant to finance the infrastructure costs. The government is financing 50% of the infrastructures and cities the other half. In the case of Lund, funding was shared as follows:

- The expected governmental grant for the tramway infrastructure amounts to SEK 360 million (EUR 37.7 million),
- The municipality finances the rest of the EUR 60-million infrastructure investment, notably thanks to the fees collected from tramway passengers and other financial levers such as poll-tax.

Nevertheless, the project faced challenges related to financing. It was uncertain whether the required leverage ratio of 20 (see introduction) would be reached in due time. From the moment the Swedish government announced that it would allocate SKR 500 million per year to cities for local public transport projects, *Tramways in Skåne* was willing to get the infrastructure part of the project financed thanks to such a grant. However, there were some delays in the attribution of the grant in Lund: SPIS did not receive the grant it expected for the year 2014. For these reasons, *Tramways in Skåne* is still facing implementation delays.

2. Organisation & partnerships

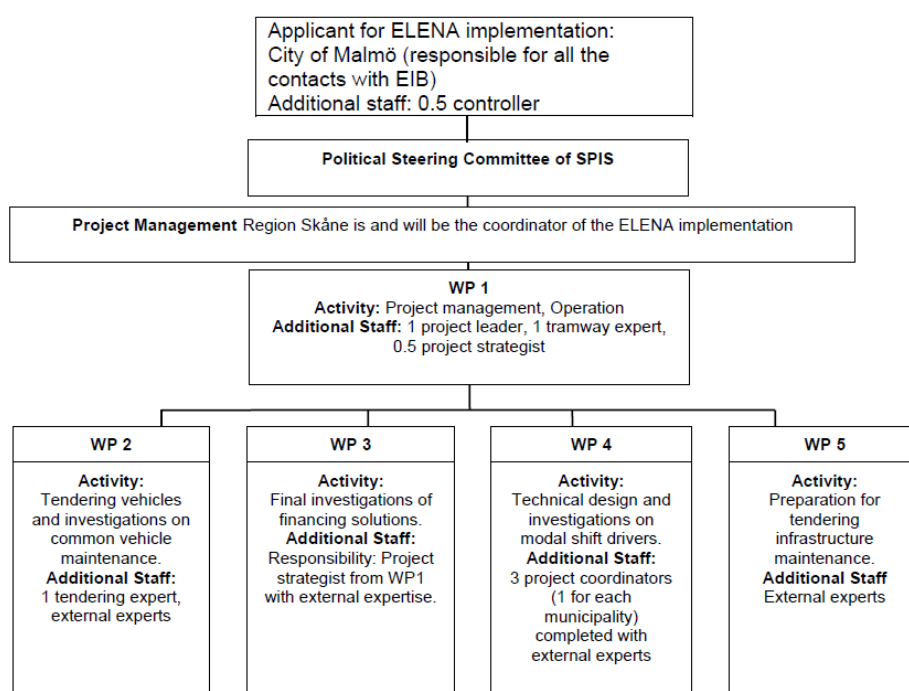
What makes *Tramways in Skåne* original is that it pools three municipalities which each develop their public transport network. Malmö, Lund and Helsingborg are coordinating their tramway investment. This cooperation brings synergies and economies of scale. The programme is a good example of multi-level governance as:

- It involves three cities pooling resources - one single office, sharing of experience, joint procurement and political motivation, notably from their Covenant of Mayors commitments;
- It is supported by the Region Skåne, in charge of the joint procurement of the rolling stock;
- It is supported by the national government, notably through a grant.

A team of eight public servants is managing the project and coordinates the different players. For the development of the investment program, the cities associated several consultancies bringing in the technical expertise. The consultants worked on technical studies related to the infrastructure planning, environmental impacts and the preparation of public procurements.

The infrastructure work was subject to a public procurement procedure without any specific criteria for the selection of the contractor. The selected companies are big Swedish public works companies that have the capacity to undertake such a large infrastructure project.

Graph 2.1: Organisational chart of the SPIS programme (courtesy of SPIS)



3. Beneficiaries

Players	Impacts of the programme
Home owners	Increase in the value of properties lying alongside the tramway lines
Citizens of the three cities	Improved public transports results in a better urban environment, quality of and a livelier city.
Commuters	Commuters in public transport will benefit from a more comfortable transport system compared to the existing bus network. Car users will however see their driving space reduced.
Business owners	Businesses in the neighbourhood of the tramway lines should benefit from an increased economic activity.

4. Results

Significant delays in the financing phase prevented SPIS from delivering the tramway in Lund at the end of 2014. However, some achievements can already be put forward as a result of the preparatory phase of the programme:

- Malmö, Lund and Helsingborg **gained valuable expertise** in managing such a project. As expected, the three cities benefited both from exchange of experience and creation of synergies. Pooling resources resulted in making economies of scale in the public procurement process, thereby reducing overall costs as well as staff costs;
- **The citizens** of the three municipalities involved in SPIS see the tramway as a positive step. A poll, organised each year since 2012, consistently shows that a majority of the population is supportive of the tramway development.

There are some uncertainties as to how much GHG-emission reduction and energy savings will actually be achieved. Indeed, the tramway network can only produce environmental benefits if people switch from their private car to this new mode of transportation. However, the expected savings would improve energy efficiency in transport by 80% by 2020 according to the modelling realised by SPIS.

Despite the overall enthusiasm by the general public for the tramway, *Tramways in Skåne* had to deal with negative critics. In Lund, a part of population was so strongly opposed to the project that a political party was

specifically created to stop the tramway development. The party received 6% of the votes at the latest municipal election. As infrastructure works started, public acceptance for the project slightly decreased. Citizens were worried about possible disturbance in traffic or changes in the urban landscape during the construction phase.

5. Promotion

To ensure the success of the project, a lot of efforts were made to promote the benefits and advantages of the tramway compared to private cars. With a large-scale communication campaign, the citizens of Lund, Malmö and Helsingborg were encouraged to change their commuting habits when the tramway would enter in operation.

The communication emphasised the European Union's support to the project. The tramway was promoted via:

- A website (www.sparvagnariskane.se/) and social media presence (Facebook);
- Leaflets were distributed in Lund and Malmö;
- Gadgets such as scarfs representing the tram's pavement (grass, concrete, etc.) were given out in Lund;
- An exhibition promoting the tramway has been installed in Lund and then in Malmö;

The SPIS project also benefits from extensive press coverage.

6. ELENA-EIB technical assistance

The cooperation between SPIS and the European Investment Bank was limited to the monitoring of the ELENA project development assistance. Indeed, while it has been considered, SPIS was not interested in asking for a loan from the EIB. However, the support from the EIB was crucial to the project as it increased the chances to get a governmental grant to finance parts of the infrastructure work.

SPIS is rather specific compared to other ELENA projects as it is a very politically-driven, large-scale project and involves three municipalities and a regional authority. The ELENA grant was very helpful in developing such an investment programme.

Besides the financial aspects, the key impacts of the ELENA-EIB technical assistance on the *Tramways in Skåne* project are the following:

- It makes a real difference to benefit from the EIB's expertise and approval of the project (to obtain grant and even for public acceptance);
- The EIB provided valuable support and assistance during the application phase;
- The support of the bank has been helpful to coordinate the project between the three cities and help them find the expected synergies;
- ELENA gave a timeframe and leverage to the project, which helped it get started – both for attracting investors and acting as a catalyst for the dynamic;

7. Key takeaways for other public authorities

The key takeaway of the *Spårvagnar i Skåne* project is the **importance of synergies in multilevel governance** and the interest of tapping into this potential. The programme, by exploiting the potential of cooperation between different cities to achieve their respective goals, is particularly interesting since it proposes an innovative approach to reach scale and reduce costs.

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BRISTOL: Bristol BRITE - developing the municipal power sector

Population: 428,100 inhabitants	Project signed on 15 May 2012	Grant from ELENA-EIB: EUR 2,612,207
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Awarded the title of EU Green Capital for the year 2015, the city of Bristol is a leading municipality in terms of local climate action. Bristol City Council's ambitions in the matter were laid out in its 2012-2015 *Climate Change and Energy Security Framework*, adopted in 2010. The Council also has a target of 40% GHG-emission reduction by 2020 compared to 2005.

To implement its climate objectives, the Bristol City Council developed an inclusive ELENA programme. Named Bristol Retrofitting - Innovative Technologies for Everyone (BRITE), the program articulates climate targets and social priorities. It is structured around the development of a municipal energy company, the first of its kind in the UK, to provide low-cost and low-carbon energy to local residents. It is associated with a scheme to improve the energy efficiency of Bristol's building stock and to increase local renewable energy supply.

1. Business model: How the programme is implemented

A municipal energy company for Bristol

In May 2012, the Bristol City Council signed a contract with the European Investment Bank for BRITE programme. This initiative aims to cut CO₂ emissions in the city of Bristol by 40% (i.e., by 37,800 tCO₂/year). To achieve this objective, the council opted for the creation of a municipal energy company, notably to provide a framework for future investments which:

- Is a means to centralise all activities from the council's energy portfolio to find synergies and avoid inefficiencies;
- Gives more responsibility to the city and includes a social dimension in energy projects;
- Gives more flexibility as to how the Council can deliver its actions and goals;
- Introduces a commercial dimension in energy efficiency and RES actions, to seek for the best cost-efficiency.

This municipal energy company in Bristol is conceived as a vehicle to help the council deliver its targets in terms of energy efficiency and renewable energy with cost-efficient actions. First of its kind in the United-Kingdom²¹, the initiative is inspired by the existing model of the German municipal energy companies: the so-called *Stadwerke*.

Bristol Energy, the name given to the municipal energy company set by the programme, is to be fully operational by the end of 2015.

Renewable energy in Bristol

BRITE aims at developing the supply of affordable renewable energy to the citizens of Bristol. To a large extent, the municipal energy company will serve as a vehicle for completing this goal. It shall act as a provider of low-carbon energy to the citizens and install renewable energy capacity in the West of England region to supply Bristol.

The Bristol City Council also supports the development of a district-heating programme in Bristol thanks to its energy company and within the framework of the BRITE programme, under which feasibility studies for the development of district heating on three sites are financed. The development of a district heating network aims at increasing the efficiency of heating in the city, and at generating electricity through cogeneration.

Effectively the entity will centralise all energy assets of the Bristol City Council, as well as its activities regarding energy demand management or other energy services. It also provides the opportunity for the council to engage local businesses in the implementation of its climate and energy targets. Moreover, it makes the link with parallel initiatives for installing renewable energy in Bristol such as the Bristol Energy Cooperative (see box below).

²¹ <http://www.bristol.gov.uk/press/new-proposal-municipal-energy-company-bristol>

Community Energy in Bristol: Bristol Energy Cooperative

Alongside the Municipal Energy Company project, Bristol City Council is supporting the development of community energy programmes in the city. This allowed the development of the Bristol Energy Cooperative (BEC), a programme that encourages Bristol's citizens to collectively invest in local energy production units.

So far Bristol Energy Cooperative issued three share offers, two of which have been completed and raised GBP 250,000 to install rooftop solar PV on community buildings for 143 kW of capacity. Future plans notably include the development of a wind farm.

The financing raised by BEC to realise these investments comes from the community. Citizens of Bristol fund the project by buying shares. This involves them in the community production process, as they are also able to contribute to future actions and the way investments are conducted. They can for instance suggest new sites for solar power implantation.



Example of ELENA-BRITE action: installation of rooftop solar PV on St. Michael's hospital - 50kW (Picture courtesy of the Bristol City Council)

Different financing mechanisms for different types of actions

Several financing mechanisms are used to achieve the different objectives of the programme, each corresponding to one of the 4 categories of actions. A significant component of the ELENA-BRITE actions is to be implemented in the building sector. Indeed, the UK has one of the most inefficient and ancient building stock in Europe and significant savings can easily be made in this sector. The aim being to propose schemes that are as adapted as possible to the actions to be financed:

Category	Type of action	Financing scheme
Community energy	Development of local and decentralised energy production	Financed by the community through the emission of bonds and shared within the community (on the model of crowdfunding)
Social housing	Refurbishment of tower blocks through actions of external insulation to improve their energy performance standard	The rent perceived by the public lessor is reinvested to finance these energy efficiency actions
Private housing	Retrofitting of private housing through actions such as solid wall insulation notably realised under the Bristol Green Deal. - Green Deal assessment: conducted	- Households subscribe to the Green Deal for GBP 49 (which allows them to benefit from a Green Deal assessment). The rest of the Bristol Green Deal is

	<p>beforehand to determine which actions should be realised in each home</p> <ul style="list-style-type: none"> - Up to GBP 10,000 per household in Green Deal finance <p>Overall, the Bristol Green Deal is part of a larger private housing initiative: Warmup Bristol²².</p>	<p>financed as follow:</p> <ul style="list-style-type: none"> - GBP 7.3 million as grant funding (from European Union) - GBP 60 million in the form of an Energy Company Obligation²³ - Additional financing comes from the UK government loans
Public Buildings	Energy efficiency retrofits are conducted in public buildings to improve the energy performance of Bristol's building stock	The financing of public building retrofitting is made thanks to the establishment of a dedicated revolving fund, which was provided by UK government loans. The retrofitting actions financed through the fund are paid back by the savings on energy bills.

Financing the programme

The overall expected investment to be mobilised for the ELENA-BRITE programme amounts to EUR 161 million, which represents a leverage factor of 62 compared to the ELENA grant funding. At the inception of the project the Bristol City Council considered subscribing to a loan from the European Investment Bank for about half of that planned investment (GBP 70 million). In the end however the council opted for a series of loans from the UK government, a type of funding source that it has more experience with – it was merely more convenient. The high threshold of EIB loans (EUR 50 million, for an overall investment of at least EUR 100 million) was indeed an issue for the Bristol City Council, as it did not know at which speed it would be able to develop the whole ELENA-BRITE programme. The minimal size of EIB loans implied the risk that the council would be holding loans it could not invest on the spot, paying interest on money it was not using. UK government loans provided more flexibility in this regard.

2. Organisation & partnerships

The ELENA-BRITE programme involves actors at every level, from European Institutions to local communities thanks to the impulse of the municipality. The Bristol City Council dedicates a specific team of 5 municipal agents²⁴, mostly financed by the ELENA subsidy, to the management of ELENA-BRITE. This team:

- Is in charge of the collaboration with the European Investment Bank, and more generally the management of the project;
- Coordinates and monitors consultants that are employed as reinforcement of the council's services – notably for legal, technical or financial assistance;
- Monitors the contractors that implement on the field energy efficiency actions and renewable energy deployment;
- Is in charge of the establishment of Bristol's municipal energy company.

A significant part of the resources for the management of the project are dedicated to external consultants for legal, technical or financial assistance on specific tasks. These actors are called in to provide their expertise to the City Council; however they do not necessarily contribute to capacity building on the long term.

²² Warmup Bristol (<https://warmupbristol.co.uk/>): a programme driven by the Bristol City Council to improve the energy efficiency of Bristol's building stock in partnership notably with Climate Energy. The scheme proposes a range of financing options to help homeowners or tenants to implement some of the 45 energy efficiency measures covered by the scheme provided they have an Energy Performance Contract or a Green Deal assessment. These options include the Green Deal, but it also notably proposes eligible citizens to subscribe to a Wessex Home Improvement Loan.

²³ Energy Company Obligation: this mechanism was introduced in UK legislation in 2012. It is based on the principle that energy companies realise mandatory offsets of carbon emissions by participating in the financing of energy efficiency measures (such as solid wall insulation) in British homes. The mechanism is designed to fit within the framework of the Green Deal initiative.

²⁴ This figure then increased to 15 agents in the last months of the project, as the Council felt short of internal manpower to implement all the actions it had planned as part of the ELENA-BRITE programme within the initial timeframe.

Overall the municipality is also an actor of the project through several of its services, not only the ELENA team, as it is involved in the refurbishment of its public buildings, which is expected to represent the bulk of the investment under this project. As the BRITE programme also plans for public housing to undergo retrofitting, Bristol's public housing sector is also mobilised.

The citizens are greatly involved, notably through the Bristol Green Deal and Community energy programmes that lead them to invest in renewable energy projects or to undertake energy efficiency actions within their own houses.

3. Beneficiaries

Players	Impact of the Programme
Citizens	Overall, the citizens of Bristol are the beneficiaries of the programme as the municipal energy company will aim at providing low-cost electricity to households and businesses.
Social housing tenants	So far, public housing tenants have been the main beneficiaries of the ELENA BRITE programme as actions have mostly been undertaken in social housing retrofitting through external insulation. They notably benefit from more comfortable houses.
Private housing	Private households benefit from assistance in planning the retrofitting of their house. They also benefit from dedicated financing mechanisms. In the future they will benefit from reduced energy bills, and increased property value.
Public sector bodies	The public sector will be the main beneficiary of the scheme, as the renovation of public buildings represents the majority of the investment realised. This will result in lower energy bills and an upgraded building stock.
Local businesses	Local businesses operating in the field of energy services and renewable energy should greatly benefit from the programme which is designed to be implemented by this type of actors.

Although actions have mostly been implemented in the social housing sector, the Bristol City Council collects feedback from the actions it has undertaken so far in order to improve the efficiency and the public acceptance of the actions. So far, the feedback received from social housing tenants is rather positive.

4. Results

The ELENA-BRITE contract was signed in May 2012, and it is still in the early phase of development. Only a limited number of actions are today in the implementation phase:

- Social housing, retrofitting of tower blocks: **28,000 social housing units** benefitted from energy retrofitting, notably external insulation
- Private housing: households have been able to undertake retrofitting of their house thanks to the Bristol Green Deal since 2013. Before that, **over 200 households** benefitted from retrofitting under the Bristol Home Energy Scheme Programme.
- Some renewable energy capacity has been installed under the **community energy scheme** (for instance solar panels on the roof of the hospital).



Example of ELENA-BRITE actions: a tower block building after refurbishment (Picture courtesy of the Bristol City Council)

5. Promotion

- EU Green Capital: the Bristol City Council was awarded the title of EU Green Capital for the year 2015, which triggered media attention for its climate actions such as the ELENA-BRITE programme;
- The City Mayor wrote a letter to the citizens to inform them on how they could benefit from the programme;
- Representatives of the Green Deal Community go door to door to see people in their home and encourage them to sign up to the scheme;
- Product demonstration were carried out in various neighbourhoods, with show houses, of the actions private citizens could undertake in their homes thanks to the Green Deal or Warmup Bristol;
- Developing one of the first municipal energy companies in the United Kingdom increased the fame of the city as some other municipalities are interested in replicating the action.

6. ELENA-EIB technical assistance

The grant of EUR 2.61 million from ELENA over three years was absolutely crucial at the inception of the BRITE programme. Without this support Bristol would probably not be in such a leading position in terms of energy efficiency and renewable energy actions. The type of financing provided by the European Investment Bank for project development under ELENA allowed the City Council to develop simultaneously a wide number of projects, without having to present a business case each time.

It also corresponded to the establishment of a long term partnership supporting the development of the programme:

- ELENA helped the Bristol City Council and the European Investment Bank to build a relationship of partnership based on extensive exchanges (the council received feedback, there were exchanges in Luxemburg with EIB experts, etc.);
- The communication with the EIB was easy and the bank showed flexibility, understanding that cities have specific constraints for such a large project;
- The EU ELENA funding provided overall stability to the development of the project. The three years period on which the subsidy is granted gives enough time to develop a solid project that is in line with the specific constraints of the city.

7. Key takeaways for other public authorities

- The ELENA grant should primarily be dedicated to **capacity-building** within the municipality, as internal staff provides benefits beyond the ELENA period. Indeed, reinforcing the municipality's capacity provides long-lasting benefits;
- **Limit the use of consultants** to specialist areas that would not justify hiring a staff member;
- ELENA should be used to develop **new set of skills** which can benefit the City Council.

A notable challenge faced by the council in implementing the programme came from the **underestimation of the needed workforce** to engage in the development of ELENA-BRITE. As a result, the number of municipal agents working on this programme increased threefold over the last months of the 3 years grant period.

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BRUSSELS-CAPITAL: Building a local pole of expertise for building-based RES production

Population: 1,1 million inhabitants	Project signed on 24 July 2013	Grant from ELENA-EIB: EUR 1,350,000
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The Brussels-Capital region is strongly committed to mitigating its greenhouse gases emissions. The *Société du Logement de la Région Bruxelles-Capitale* (SLRB, Housing Company of the Brussels-Capital Region), the public company in charge of the region's social housing programme, is doing its share of the work within the VAMOS Vert. *Une Aide à la Maîtrise d'Ouvrage Sociale* (VAMOS, Green. An help to social project management) programme. Indeed, from the observation that there was a lack of capacity in integrating renewable energy to building renovation programmes, the SLRB undertook the project of developing an internal team that would bring this type of expertise to the region.

The project VAMOS thus aims at transforming Brussels' social housing sector on the long term by creating a new culture regarding the integration of renewable energy production in building retrofitting projects or construction. To do so, the programme is acting on two aspects: capacity building with project developers and financing mechanisms of the incremental costs of renewable energy production.

1. Business model: How the programme is implemented

Energy production in public housing: creating a long-term dynamic

The VAMOS project is undertaken by the SLRB in order to develop a local pole of expertise for integrating renewable energy sources to social housing projects. The VAMOS programme is expected to yield reduction of some 9,534 tonnes of CO₂ emissions, and 43.9 GWh of energy savings between 2013 and 2016. Besides, the programme aims at generating 1.3 GWh of electricity from renewable energy sources by the end of the period. This shall be done thanks to the mobilisation of some EUR 124 million in investment.

The SLRB oversees some 30 '*Sociétés Immobilières de Service Public*²⁵' (SISPs). These SISPs manage the stock of social housing of the Brussels-Capital region, which includes retrofitting projects. They dispose of funds to undertake these actions, and have extensive knowledge of the potential of retrofitting actions in terms of energy savings. However, the SISPs do not have the expertise for integrating energy production in the buildings. Neither do they always have the funds necessary for this.

On this basis, the SLRB developed the VAMOS project that aims at:

- Capacity building for developing local expertise in mainstreaming energy production in public housing projects – be it for retrofitting or new constructions (see Organisation and Partnership);
- Setting up of financing mechanisms for integrating renewable energy in buildings.

Overall, VAMOS aims at mainstreaming the integration of renewable energy production in public buildings, alongside energy efficiency, beyond the year 2016. The project was conceived with the aim to develop a local pole of expertise in this domain.

Financing the implementation of the project

The SLRB usually undertakes massive investments. These investments are defined in *quadrennial investment plans*²⁶ that list the different investments to be realised by the SISPs in partnership with the SLRB. The retrofitting and construction projects undertaken by the SLRB already include an energy efficiency dimension. The VAMOS team concentrates on the projects of the 2014-2019 plan. The actions carried out within the scope of the project include:

- Feasibility studies for integrating renewable energy technologies in buildings;
- Development of renewable energy production and cogeneration in buildings;
- Support and assistance to the SISPs for integrating renewable energies in their projects.

²⁵ Local public housing companies

²⁶ *Plan d'investissement quadriennaux*: <http://www.slrbr.be/page-daccueil/1/1/la-slrbr/nos-missions/plans-dinvestissements>

The investment programme for VAMOS amounts to EUR 124 million, an expected leverage ratio of 92 compared to the EUR 1.35-million grant received under the ELENA-EIB facility. It covers three sectors – renovation, energy production, new-built – as follow:

Investment programme	Objective	Size of the investment (€ million)
Building renovation	EE	99.2
Cogeneration and renewable energy production	RES + EE	11.4
New-built	EE + RES	13.4
Total:		124

Financing for these projects mostly comes from the funds of the SISPs' or the SLRB's budget. Indeed, these companies have to manage a large stock of public housing buildings and to some extent the construction of new buildings and have large investment capacities.

The projects are managed by the SISPs, but the SLRB provides both technical and financial assistance at different levels of the projects. For instance the SLRB can finance projects undertaken by a SISP in various ways, most notably loans.

However, to scale up the integration of renewable energy production in public housing buildings, the SLRB develops new financing instruments to help the SISPs in financing the additional costs caused by the installation of energy producing equipment within the buildings:

- VAMOS Revolving Fund: its role is to help the SISPs install cogeneration or renewable energy production in their buildings. The fund is set by the SLRB, and is to provide EUR 3 million over three years to the SISPs through 10 years loans. The lending period should be typically longer than the break-even price of the energy production equipment, allowing the SISPs to benefit from the action.
- ERDF subsidy of 50% of the installation of energy production or cogeneration unit. The SLRB is attempting to obtain a grant from the ERDF in order to subsidise the installation of cogeneration or renewable energy production units in buildings. The ERDF's support would then allow the SLRB to subsidise up to 50% of the installations of new equipment by the SISPs.
- Finally, the SLRB is in the early phase of experimenting with the development of third party financing for energy production in public housing. The modalities of the deployment of such a mechanism are under investigation by the VAMOS team, but should enable a wider development of renewable energy production in buildings thereafter.

2. Organisation & partnerships

To manage the implementation of the project VAMOS, the SLRB set up a team of two agents specialised in integration of renewable energy technologies in buildings. This team starts operating upon the SISPs' request. The agents that compose this team are specialised on integrating energy production technologies in buildings.

The team serves as a link between the SLRB and the SISPs, and represents a local pole of expertise on the issue. It works with the project managers of building renovation and construction (from the SISPs or the SLRB) as well as with other services of the SLRB. The team has a wide array of missions:

- Take part in feasibility studies, issue calls for procurements and tender specification;
- Serve as a link between engineering consultancies and project managers;
- Bring internal expertise on energy production issues to the SLRB;
- Design a standard method for integrating energy production in public housing projects, in spite of a complex legislation.

The VAMOS team works in close cooperation with different partners:

- The 30 SISPs: owners of Brussels' public housing buildings and managers of retrofitting projects, the SISPs are local companies structurally independent from the SLRB and in charge of the management of Brussels' public housing buildings. They however are under the SLRB's authority. The project managers voluntarily join the VAMOS team to integrate renewable energy production to their projects.
- Engineering consultancies: the VAMOS team works with engineering consultants to undertake feasibility studies. The assistance of these private companies reduces the implementation costs of a project – by

reducing the size of the permanent internal team. Yet, their main value is to give credibility to a project by providing an independent technical and financial evaluation of its viability.

3. Beneficiaries

Players	Impact of the programme
Social housing tenants	<ul style="list-style-type: none"> - More comfortable housing thanks to better insulation - Lower energy consumption and thus lower energy bills (excluding rebound effect) - Potentially reduced charges thanks to the redistribution of the benefits of the building's energy production
SISPs	<ul style="list-style-type: none"> - Investments in buildings preserve or increase their value - As public service companies, they are more interested in the well-being of their tenants than in financial profits
SLRB	<ul style="list-style-type: none"> - Gains expertise in integrating renewable energy in buildings - Brussels' social housing is more energy efficient, more sustainable

4. Results

Signed in September 2013, the VAMOS programme is still in its early phase. There have not yet been effective results in terms of energy production. Indeed, even the ongoing projects in which the team VAMOS was involved are merely about to start. However, the programme has been rather successful in attracting project managers. Indeed, the team has identified some **67 projects** so far. Of these, some 30 are still ongoing and receiving assistance from VAMOS and the SLRB to integrate renewable energy production²⁷.

The success factors of the programme identified by the SLRB are:

- **The enthusiasm** of the actors of the sector - the success of VAMOS is dependent on the engagement of project managers;
- **Timing** - to be efficient, the integration of energy production in a project must intervene as early in the project as possible;
- The support from the ELENA-EIB facility: the cooperation with the European institutions made the SLRB's internal hierarchy more determined to make the programme successful. It also gave **a framework** to the programme that helped structure it.

5. Promotion

Being mostly directed to a set of targeted professionals, VAMOS did not benefit from a widespread communication from the SLRB's side. However, some actions have been undertaken, mostly to inform the project managers:

- Workshop directed to the SISPs in order to advertise the benefits and opportunity that VAMOS represents for them;
- Advertisement of the programme in the internal review of the SLRB: *SLRB Info*²⁸.

The team puts most of its energy in the translation of the initiative in concrete results before engaging heavily in communication. Besides, once the team VAMOS has developed a third party investment mechanism, it will need to advertise it largely in order to attract investors.

6. ELENA-EIB technical assistance

A specificity of the VAMOS programme is the fact that the assistance from ELENA was not sought for a single project, but rather to build capacity on the long term. The SLRB's ELENA programme is partly defined by the tension between the construction sector's business model and the requirements of the ELENA-EIB facility. This was a source of difficulties for the SLRB in designing its project and the company had to design a way to mobilise sufficient amount of investment in the short term to reach the necessary leverage ratio, while still

²⁷ The SLRB does not have an estimate of the number of housing concerned by these projects. As an indicator, public housing projects in Brussels-Capital generally range from a dozen housing units for small projects to some 300 for big ones.

²⁸ SLRB Info #63 and SLRB Info #71

committing to capacity building on the long term. However, the grant provided under ELENA was crucial to the implementation of VAMOS. Indeed, prior to the programme, there was a dramatic lack of expertise on energy issues in the SLRB or the SISPs, and developing such a local pole of expertise required significant resources. The programme triggered the development of new cross-cutting skills on energy issues in the Brussels' social housing sector.

Despite this structural tension, that was finally overcome, the collaboration was rather positive between the European Investment Bank and the SLRB in the conception phase of the VAMOS programme. The EIB indeed provided an appreciated expertise, notably with feedback of constructive inputs for designing the business plan of "an enterprise that will last three years, and keep going on". The bank's support was quite appreciated by the SLRB, helping to develop the project before its implementation, building trust on a partnership dynamic. Thereafter, the link with the bank was more formal, and mostly became an important tool for asserting the value of the VAMOS programme to the partners and other internal services.

7. Key takeaways for other public authorities

- Although the three-year window of time limits the scope of quantified impact, the ELENA programme can provide the opportunity to create a **dynamic process with long-term consequences** for a local authority or public entity's business model.
- Beyond the perspective of the short term investment, this programme used ELENA for **capacity-building** in order to mainstream renewable energy production in its investment projects.

Challenges

The main challenges experimented in the implementation of VAMOS were:

- The complexity of the Belgium legislative framework for integrating energy production in buildings.
- The schism between the programme's long term view and the short term scope of the ELENA grant.

This last challenge notably results from some specificities of the building sector in which the SLRB is involved. In this sector the definitive approval of an investment can take up to three years. This corresponds to the duration of support under the ELENA-EIB facility, during which recipients are expected to produce the minimal leverage ratio of 20. It was challenging for the SLRB to adapt its project to this framework. Thus, the VAMOS team intervenes to integrate renewable energy sources in different ongoing projects of the EUR 60 million portfolio of projects handled by the SLRB, upon request by the project managers (SISPs).

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