



FAQs

Guidance on negative emissions for cities

30 June 2026

Background Information

The "[Guidance on Negative Emissions for Cities](#)" (Ulpiani et al. 2026) is primarily aimed at cities participating in the 100 Climate-Neutral and Smart Cities Mission, though it can serve as a conceptual and practical reference for any city pursuing net-zero targets. Its main objectives are to provide clear direction on negative emissions strategies and accounting, distil key guiding principles, and establish a conceptual framework for emissions compensation mechanisms, including local carbon removals and carbon credits.

This document is a companion FAQ to the Guidance, addressing recurring questions on its interpretation and practical application

Content

1. How should BECCS and EU ETS-covered installations (e.g., waste-to-energy plants) be treated under the negative emissions guidance?

The Mission guidance does not recommend excluding emissions from ETS facilities. The guidance outlines the possibility for cities to exclude certain emissions sources from the target when backed by a strong rationale on the inability of the city to drive significant emissions reduction by 2030. ETS is mentioned as a possible candidate for exclusion given that emissions reductions are already regulated and typically not in the city's hands.

BECCS is a permanent CDR option, a perfectly valid approach to compensate for residual emissions. When BECCS is implemented at an ETS installation and the ETS installation is part of the city target, the associated net negative emissions count towards that target. If the facility is excluded then the city cannot selectively consider its negative emissions contribution without bringing in the emissions as well (de facto annulling the exclusion).

2. How to account for or calculate negative emissions?

There are various methods out there, often depending on the CDR option at stake. The general rule is that, for any in-boundary CDR activity, the net removal is calculated in two steps:

- **Step 1 - Quantify gross removals:** Measure the amount of GHGs removed and stored in the accounting year. This must be monitored continuously, as reversals (carbon being re-released) must be reflected here if detected.

- **Step 2 - Subtract associated emissions:** Deduct all direct and indirect GHG emissions attributable to the CDR activity in the same accounting year, including emissions from chemicals, fuel, energy, transport, and land use change.

The result is the **net removal**, expressed in tonnes of CO₂-equivalent, which enters the city's net emissions calculation as a negative number. If associated emissions outweigh the removal (i.e., the activity is a net source), the city is advised to discard it or provide a clear justification for keeping it.

An important nuance: **emissions reductions achieved as a co-benefit of a CDR activity are not counted as part of the net removal**. They belong on the emissions reduction side of the ledger.

The Guidance (Section 7) explains all this, and its sub-sections set out sector-specific approaches:

- **Land sector (notably forests, trees, wetlands; Section 7.1):** the GPC Supplemental Guidance for Forests and Trees and the IPCC Wetlands Supplement provide the relevant methodologies.
For forests and trees (Section 7.1.1), the accounting is based on land use change matrices, used to calculate net carbon stock changes, noting that unchanged land use is not unchanged carbon stock. Then there are two fundamentally different yet equally valid approaches to estimate CO₂ (positive and negative) emissions from land, endorsed by the IPCC:
 - the stock-difference method, which estimates the difference in carbon stocks (i.e., total amount of carbon in a given reservoir) at different points in time; and
 - the gain-loss method, which estimates the net balance of additions to and removals from a carbon reservoir.

The Guidance goes into the details of the gain-loss method, as it respects the Transparency Principle (Section 6.2) and follows the typical approach used in GHG inventories for other sectors: emissions are estimated as the product of activity data and emission factors (i.e., the amount of carbon emitted by each carbon reservoir per unit of land area), while removals are estimated as the product of activity data and carbon gain factors (i.e., the amount of carbon accumulated per unit area of land use or land use change per year). Each city should carefully select the sources that best balance different objectives (e.g., accuracy, continuity of provision and frequency of updating, level of detail, geographic coverage). No single data source may meet all the desirable criteria and multiple data sources could be - appropriately - combined.

For wetlands (Section 7.1.2) the IPCC 2006 Guidelines and 2013 Wetlands Supplement provide the applicable methodologies, with three tiers of detail (Tier 1 being the default). Cities need to establish a baseline of current carbon stocks and emissions; quantify emissions and removals from rewetting, restoration, or drainage activities; and monitor the full extent of wetlands comprehensively - not just areas being restored, but all areas where drainage may have deepened or shallowed.

- **Built Environment / Buildings (Section 7.2).** In alignment with the CRCF, net removals are calculated as gross carbon stored in the materials minus all upstream emissions (processing, transport, construction). Default coefficients (kg CO₂ stored per m² of floor area) from databases such as ecoinvent or the ICE database can be used where detailed data (from e.g., material passports, digital building logbooks, or urban material registries) is unavailable. Any reversals (fire, demolition) must be recorded as emissions.

Managing uncertainty

The Guidance acknowledge that uncertainty is significant, especially for temporary removals (forests, wetlands). Recommended approaches (Section 7.3) include:

- **Map-based / GIS approaches** to reduce risk of non-exhaustive or double-counted reporting.
- The **Probability of Exceedance** method (Box 39) for statistical uncertainty estimation.
- A **data quality grading system** (Table 11): High = local data; Medium = modelled/national data; Low = IPCC defaults.

Cities are advised to participate in inter-city exchanges and monitor new protocols as they emerge.

3. How should hard-to-abate sectors be treated (e.g., industrial emissions that cannot be avoided without eliminating the industry altogether)?

This question seems to refer to what we would legitimately qualify as residual emissions (Section 4). In the context of a net-zero target, such emissions would need to be compensated through local removals or credits. Partnership with the steel industry stakeholders could be sought and coordination with their own climate targets (if any) should be established.

4. How should residual emissions be estimated and is there a fixed percentage threshold?

The Guidance is explicit that residual emissions should never be defined by simply setting a target percentage (see Sections 3 and 4 in particular). In the Mission, indicatively, residual emissions should stay below a ceiling of 20% of a recent baseline. However, this is an orientation, not a hard rule. Where unavoidability is duly proven, residual emissions may exceed 20%; equally, where further reduction beyond 80% is feasible, the target and planning should reflect that higher ambition. Residual emissions must be the outcome of a rigorous, iterative analytical process. Here is how that works in practice (Figures 1 and 2 in the Guidance):

- **Step 1: Start from baseline emissions and calculate "remaining" emissions.** Begin with a recent, comprehensive baseline GHG inventory - or a robust business-as-usual (BAU) scenario. From that baseline, subtract all the emissions reductions associated with the city's full portfolio of planned climate actions. What is left are **remaining emissions**. These are not yet residual emissions. A further analytical step is required.
- **Step 2: Analyse remaining emissions source by source.** For each source of remaining emissions, the city must work through a structured three-phase analytical framework (Section 4):
 - **Phase 1: Identify sources that cannot be brought to zero.** Map which remaining emission sources are especially difficult to abate. Common candidates include high-rise building cooling, industrial processes (cement, steel, ceramics, chemicals), aviation and waterborne navigation, waste incineration, and agriculture.
 - **Phase 2: Explore possible solutions.** For each source, investigate whether any technically or economically feasible abatement option exists now or in the **foreseeable future**.

- **Phase 3: Understand the constraints preventing further reduction.** If solutions exist, the city must ask: can the constraints preventing their implementation be lifted? The Guidance distinguishes between:
 - **Tier 1 constraints:** obstacles the city can potentially overcome or significantly influence (e.g., local permitting, budget, awareness).
 - **Tier 2 constraints:** barriers beyond the city's control, such as national regulations, grid limitations, or insurmountable technological barriers within the timeline.

The outcome of this analysis is rated on a **6-level scale of unavoidability**, with Level 1 representing the strongest case for compensation (acknowledged source, no established solutions, and tier 2 constraints). The Guidance provides a worked example for the waste sector (Box 1) to illustrate the breadth of options to consider and questions to be asked before ruling out emissions reduction.

- **Step 3: Iterate the process.** The Guidance emphasises that this is not a one-off exercise. Residual emissions must be **recalculated at each inventory update** as new technologies emerge, market conditions change, and local political and social contexts evolve. The expected volume of residual emissions should be updated every time the GHG inventory is reviewed.

Key warning from the Guidance

Failing to conduct this analysis rigorously carries real risks: it creates pressure for an oversized carbon removal infrastructure, limits the co-benefits of emissions reduction at source for local communities, increases reliance on technologies not yet proven at scale, and may increase system-wide spending in the long run. Defining residual emissions through target-setting rather than analysis also undermines the credibility and legitimacy of the net-zero commitment and opens the city to accusations of greenwashing or mitigation deterrence.

5. What is the city's responsibility for sectors largely outside its control (e.g., F-gases, IPPU, and LULUCF)?

The question **partly conflates two separate aspects** that the Guidance keeps carefully distinct: **what goes into the target boundary** and **what constitutes a residual emission once it is in the boundary**.

Target exclusions are an option for Mission Cities that are committed to achieving a highly ambitious but realistic net-zero target by 2030, where it is genuinely not feasible to reach net zero across all emission sources. Large-scale industrial IPPU facilities especially those covered by the EU ETS represent common exclusions. Strong rationales are needed for any exclusion, with a commitment to address them no later than 2050. If a city proposes target exclusions, it cannot claim any negative emissions generated by the excluded emission sources.

Conversely, if a city chooses to include a sector, greenhouse gas, emission source, or geographical area within its target, it accepts responsibility for delivering the actions needed to achieve net zero within that scope. Even in hard-to-abate sectors, what truly matters is that the city makes all efforts to exhaust both its sphere of control and sphere of influence to reduce the associated emissions. A city may not control an industrial IPPU facility directly, but it can still act as:

- **Convener:** raising awareness, facilitating dialogue with facility operators, and building coalitions to advocate collectively.

- **Regulator:** leveraging environmental permits, planning permissions, and procurement requirements to create incentives or requirements for emissions reduction.
- **Funder or investor:** providing catalytic finance for abatement technologies within those facilities.
- **Strategiser:** integrating IPPU and F-gas reduction into the Climate City Contract to align national-level actors around shared targets.

For LULUCF specifically, the same logic applies. Even if the city does not own the land, it can influence land management through spatial planning, subsidies, partnerships with land managers and farmers, or by developing urban-regional partnerships to align land-use demand with carbon sequestration.

The Guidance is explicit: the CCC process is **designed as an instrument to gather stakeholders and other levels of government around the climate neutrality target, to align efforts and remove barriers that come from fragmented governance**. Rather than treating hard-to-abate sectors as a reason not to act, the city should use the CCC to bring the relevant actors to the table and work to lift any prominent constraints where possible. Document the governance constraints clearly in the Climate Neutrality Action Plan and use the CCC process to engage national and EU actors to create enabling conditions (e.g., better F-gas regulations, industrial decarbonisation support, land management incentives).

Emissions that face insurmountable constraints within the timeline, are precisely the most legitimate candidates for compensation rather than reduction. The city isn't asked to reduce what it cannot reduce; it is asked to compensate for what it cannot reduce.

Key Documents

[Guidance on negative emissions for cities](#)

ULPIANI, G., VETTERS, N., GEVERS DEYNOOT, C., AKTAS, S., BARBERI, M. et al., Guidance on negative emissions for cities - Guidance on the definition of residual emissions in net-zero emissions targets, on decision-making and accounting around carbon removal, Publications Office of the European Union, Luxembourg, 2026, <https://data.europa.eu/doi/10.2760/5398979>, JRC145723.

[Guidance on negative emissions for cities - Summary for Decision Makers](#)

GEVERS DEYNOOT, C., ULPIANI, G., VETTERS, N. and BARBERI, M., Guidance on negative emissions for cities - Summary for Decision Makers, Publications Office of the European Union, Luxembourg, 2026, <https://data.europa.eu/doi/10.2760/4262978>, JRC146130.

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