Training materials on climate action MRV, modelling and innovation in impact assessment

Authors: Olga Krajewska; Jurijs Grizans, Alis-Daniela Torres (ICLEI Europe)

Contributor: Gudrun Haindlmaier (AIT)

DELIVERABLE NUMBER:	D4.4
DELIVERABLE NAME:	Training materials on climate action MRV, modelling and innovation in impact assessment
WORK PACKAGE (WP):	WP4
DELIVERY DUE DATE:	30/06/2023
ACTUAL DATE OF SUBMISSION:	10/08/2023
DISSEMINATION LEVEL:	Public
LEAD BENEFICIARY:	ICLEI Europe
MAIN AUTHOR:	Olga Krajewska

Table of contents

CAPACITIES
Advancing national support
for climate neutral cities

P a g e | 4

Executive summary

CapaCITIES supports European countries in creating national structures to support theEuropean Cities Mission at the national level. The ongoing activities and respective knowledge of the national actors that are part of the CapaCITIES consortium are at the heart of the project. With this deliverable, we want to provide the national partners in CapaCITIES with a handy repository of knowledge that collects key information on the Monitoring, Reporting and Verification (MRV), modelling and impact assessment processes for carbon neutrality, with a specific focus on the role, opportunities and barriers for local governments.

Introduction

This deliverable is linked to the Task 4.3 in CapaCITIES that aims to introduce actors in each Core Country's climate neutral cities ecosystem to standard climate impact reporting platforms and to equip them with the knowledge needed to support quantitative impact assessment of climate action. To this end, the D4.4 was created as a knowledge repository that includes key information on MRV, modelling and innovation in impact assessment, as well as links to relevant resources, guidelines and platforms.

Based on the self-assessments of the Core Countries (D4.1) and regular exchange with the national partners, it was brought to our attention that a mapping of national MRV frameworks across Core Countries would be a helpful resource. It would include key information about institutions at different levels (local, regional, national) engaged in the MRV work in the countries, connections between these institutions, as well as their role and relationship towards local governments. The resource would present good practices in MRV work across selected European countries. Preparing such a mapping requires, however, an extensive research analysis of national MRV frameworks, including review of available resources, mapping of relevant actors and interviews with them, which should be done locally. The WP4 will closely collaborate with the national partners from the CapaCITIES Core Countries and try to bring this task forward. Any updates and new findings will be documented in these training materials. Furthermore, this work will be included in the CapaCITIES learning portfolio (D2.3), which is currently being established.

1. Monitoring, Reporting and Verification

Monitoring, Reporting and Verification (MRV) refers to a systematic process of monitoring, reporting, and verifying the GHG emissions and mitigation actions undertaken to address climate change. The purpose of MRV is to track and assess progress towards climate change goals and targets, such as those outlined in international agreements like the Paris Agreement. It helps countries, municipalities, organisations, businesses and projects understand their emissions profile, identify areas that require improvement, and demonstrate their efforts in addressing climate change. MRV also facilitates transparency, comparability, and accountability by providing a standardised framework for reporting and verification.

Implementing MRV systems by local governments can bring about multiple benefits at both local and national levels.

At the local level:
- **Enhanced Accountability**: MRV systems enable local governments to measure and track their progress in achieving climate and sustainability goals. It enhances accountability by providing transparent data on local emissions, energy consumption, and the effectiveness of local policies and actions.
- **Informed Decision-making**: MRV data provides valuable insights into the local context, allowing policymakers to make informed decisions regarding climate and sustainability actions. It helps identify priority areas for action and supports evidence-based planning.
- **Informed Resource Allocation:** MRV data assists local governments in allocating resources effectively. It helps prioritise investments in climate-friendly infrastructure, renewable energy projects, energy efficiency measures, and other initiatives that can have a significant impact on emissions reduction.

At the national level:
- **Data Aggregation and Reporting**: MRV systems at the local level could contribute to national-level data aggregation, enabling national governments to assess progress towards national climate and sustainability targets. It supports national reporting obligations under international agreements and helps track overall emissions reduction efforts.
- **Policy Development and Evaluation**: MRV data from local governments provides valuable information for national policymakers to develop and evaluate climate and sustainability policies. It helps identify successful practices, lessons learned, and areas requiring further policy intervention or support.
- **Target Setting and Monitoring**: Local MRV data can inform the setting of national emission reduction targets and sector-specific goals. It helps monitor progress towards these targets and supports the design of effective policy measures to achieve them.
- **Knowledge Sharing and Capacity Building**: MRV systems support knowledge sharing and capacity building between local and national governments. Lessons learned from local experiences can be shared and scaled up at the national level, promoting collaboration, innovation, and the dissemination of good practices.

1.1 Monitoring

Monitoring involves the collection and analysis of data related to greenhouse gas (GHG) emissions and removals. It includes measuring and tracking emissions from various sources, such as energy production, industrial processes, agriculture, forestry, and waste management. Monitoring also includes data on the implementation and performance of climate change mitigation and adaptation actions.

Key guidelines and frameworks for GHG emissions accounting and monitoring by cities

There are several guidelines and frameworks to support cities in monitoring GHG emissions. In 2021, ICLEI Europe developed a review of city-level GHG emissions accounting and monitoring methodologies commonly used by cities. The analysis showed that a diverse range of methods and standards were, and still are, in use. Three main methodologies were identified among the cross-section of cities:

- The Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC); (GHG Protocol, 2014)

- The Intergovernmental Panel on Climate Change (IPCC) 2006 Guidelines; (IPCC, 2006)

- The Baseline / Monitoring Emissions Inventory Approach (BEI/MEI) of the EU Covenant of Mayors (Bertoldi, P. et al., 2018), and

- Hybrid or custom approaches from national guidelines, often based in part on the methodologies mentioned above)

GPC is the most commonly used methodology for emissions accounting in European cities, followed by the 2006 IPCC Guidelines and the BEI/MEI EU CoM methodologies. In addition, the "other" methodologies are used in cities in countries with robust national and pre-established reporting guidelines. For example, BASEMIS in France, BISKO Standard in Germany, among others.

The diversity of methodologies used by cities, confirm the significant levels of experience many European cities have in GHG emissions accounting, in addition to underscoring the maturity of climate action in Europe.

Here are the key guidelines commonly used for monitoring GHG emissions at the city level:

- **The Global Protocol for Community-Scale GHG Emission Inventories (GPC)**

    → download

The GPC is a widely recognized framework developed by the World Resources Institute, C40 Cities Climate Leadership Group and ICLEI - Local Governments for Sustainability. It provides a standardised methodology for cities to measure and report GHG emissions.

Accounting sectors

Local governments shall account and report GHG emissions from the following sectors: (a) stationary energy, (b) transportation, (c) waste, (d) industrial processes and product use, (e) agriculture, forestry, and other land use, (f) any other emissions occurring outside the geographic boundary as a result of city activities (WRI, C40, ICLEI, 2021 edition).

You can watch the explanatory video here.

- **The EU Covenant of Mayors' Baseline Emission Inventory (BEI) / Monitoring Emission Inventory (MEI) methodology**

  → download

This methodology is a standardised approach for assessing and reporting GHG emissions at the local level. It provides a framework for cities and municipalities to measure, monitor, and report their emissions, as well as track progress towards their climate and energy goals.

Accounting sectors

According to the Covenant of Mayors for Climate and Energy (CoM) methodology, there are four key mitigation sectors: (1) residential, (2) tertiary, (3) municipal and (4) transport. Local authorities focus on reducing the energy demand in their territory as well as on matching energy demand with supply by promoting the use of local energy resources (EU CoM, 2016). On the adaptation side, the main vulnerable sectors are the following: (1) buildings, (2) transport, (3) energy, (3) water, (4) waste, (5) land use planning, (6) environment & biodiversity, (7) agriculture & forestry, (8) health, (9) civil protection & emergency, (10) tourism, (11) other (EU CoM, 2016).

- **The IPCC Guidelines for National Greenhouse Gas Inventories**

  → download

The 2006 IPCC Guidelines for National Greenhouse Gas Inventories provide methodologies for estimating national inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases. The guidelines were prepared in response to an invitation by the Parties to the UNFCCC.

Accounting sectors

According to the Covenant of Mayors for Climate and Energy (CoM) methodology, there are four key mitigation sectors: (a) energy, (b) industrial processes and product use, (c) agriculture, forestry, and other land use, (d) waste.

1.2 Reporting

Reporting refers to the regular submission of information on GHG emissions and mitigation actions to relevant authorities or international frameworks. This typically involves preparing and submitting comprehensive reports that detail the measured or estimated emissions, along with information on the methodologies, assumptions, and data sources used in the calculations. Reporting enhances transparency and accountability in addressing climate change.

- **The Global Covenant of Mayors' Common Reporting Framework (CRF)**

    → download

The Global Covenant of Mayors for Climate & Energy (GCoM) is a global alliance of cities and local governments committed to taking action on climate change and promoting sustainable energy. The Common Reporting Framework (CRF) is a standardised reporting tool developed by the Global Covenant of Mayors to help cities track and report their climate and energy data.

The CRF provides a common set of indicators and methodologies for cities to report on their GHG emissions, energy consumption, and climate mitigation and adaptation actions. It aims to ensure consistency and comparability in reporting across cities, facilitating data aggregation and analysis at the global level.

Accounting sectors
Local governments shall account and report GHG emissions from at least three main sectors, namely stationary energy, transportation, and waste. Reports on emissions stemming from Agriculture, Forestry and other Land Use (AFOLU) as well as from Industrial Processes and product Use (IPPU), are optional.

Key climate reporting platforms for cities

Both platforms are officially recognised within the work of the Net Zero´s cities mission.

- **CDP-ICLEI Track**

    → check online

CDP-ICLEI track is the world's leading climate reporting platform designed to support local governments in reporting and managing their GHG emissions and climate change data. It provides a platform for cities to disclose their emissions data, climate-related actions, and strategies for climate resilience. The initiative aims to enhance transparency, accountability, and knowledge sharing among cities to drive climate action.

In 2022, over 1000 cities disclosed their data through CDP-ICLEI Track with almost 200 of them in Europe. These cities are reporting their urban sustainability actions (such as energy efficiency and increased green spaces). CDP-ICLEI Track also measures their progress on the UN-backed climate campaigns, Race to Zero and Race to Resilience, which bring cities, businesses and investors together to create a zero-carbon and resilient future. Through CDP-ICLEI Track, cities are also able to report to several initiatives such as numerous ICLEI initiatives, C40, WWF and Global Covenant of Mayors at the same time.

Cities reporting on the CDP-ICLEI track receive feedback on their reporting. Every year, CDP recognizes cities with outstanding climate action performance by scoring and including them in the CDP A-List. CDP scores cities that publicly report through CDP-ICLEI Track in particular topics, such as if they have a city-wide emissions inventory, have published a climate action plan, if their emissions reduction targets are aligned with science-based climate targets (to include a long-term by 2050 net-zero target or a mid-term target that is aligned with a fair share of limiting global warming to 1.5˚C). An A List city must also complete a climate risk and vulnerability assessment (CRVA) and have a climate adaptation plan to demonstrate how it will tackle climate hazards. In 2022, 20 EU cities were part of the 122 cities rated in the CDP-ICLEI list.

- **My Covenant**

    → check online

My Covenant is a reporting platform for the Covenant of Mayors' signatories.They can use it to report and monitor data of their Sustainable Energy and Climate Action Plans (SECAPs), via the so-called SECAP template. Reported data allows signatories to demonstrate the concrete impact of their actions in the field and their climate ambitions. It gives essential feedback on local activities to national, European and international policymakers. The Covenant framework allows signatories to collect and analyse data in a structured and systematic manner and serves as a basis for good climate and energy management and for tracking progress in implementation.

💡 **Helpful resources**

2023 Cities Reporting Guidance by CDP-ICLEI → check online

Reporting Guidelines by the Covenant of Mayors → download

1.3 Verification

Verification refers to the independent assessment and confirmation of reported data and information. It aims to ensure the accuracy, completeness, and reliability of the reported emissions and actions. Verification can be conducted by third-party organisations, auditors, or designated entities with expertise in GHG accounting and verification procedures. It provides assurance that the reported data is consistent with established guidelines and standards.

Verification in the GPC

The Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC) recognizes the importance of verification to enhance the credibility and accuracy of reported data. Here are some key points from the GPC regarding verification:

- **Voluntary**: The GPC does not require that cities verify their inventory results but recommends that cities choose the level and type of verification that meets their needs and capacity.
- **Increases credibility**: Verification can increase credibility of publicly reported emissions information with external audiences and increase confidence in the data used to develop climate action plans, set GHG targets and track progress.
- **Standards**: Verification involves an assessment of the completeness, accuracy and reliability of reported data.
- **Third-party vs self-verification**: While verification is often undertaken by an independent organisation (third-party verification), this may not always be the case. Many cities interested in improving their GHG inventories may subject their information to internal verification by staff who are independent of the GHG accounting and reporting process (self-verification).
- **Criteria**: Verification criteria for a GHG emissions inventory should include the following:
    - Inventory boundary is clearly and correctly defined.
    - All required emission sources are included, and notation keys have been used appropriately.
    - Calculations are consistent with the requirements of the GPC
    - Data are time- and geographically specific to the inventory boundary and technology-specific to the activity being measured.
    - Data are sourced from reliable and robust sources and referenced appropriately.
    - All assumptions are documented.
- **Process**: Verification will usually be an iterative process, where an initial review - highlighting areas of non-compliance and/or queries relating to the assessment - offers an opportunity to make any necessary updates to the GHG inventory before the verification report is produced and conformity with the GPC is determined.

💡 To learn more about the GPC recommendations for verification, please look up the *Global Protocol for Community-Scale Greenhouse Gas Inventories. An Accounting and Reporting Standard for Cities Version 1.1* by WRI, C40 and ICLEI → check online

Verification in the GreenClimateCities programme

In the context of the local governments, ICLEI has developed a set of verification criteria for the local government's self-evaluation or for a third-party verifier to ensure the successful implementation of the low-emission development trajectory (GreenClimateCities programme)[1]. The process has been broken down into concrete steps. Each step has a list of verification criteria assigned.

For the purpose of this training material, we will focus on Step 3. "Set Baseline" of the process, which includes the following sub-steps:

- Develop GHG Inventory
- Analyse and forecast
- Compile Baseline Synthesis Report

For each sub-step of the process, there is an 'MRV box included, which indicates required actions ("Measures") and deliverables ("Reporting material").

MRV for Sub-step 3.1 Develop GHG Inventory

Measures

- ✓ Follow the approved rules and regulations to compile a community-scale GHG inventory, including a local government operations GHG inventory.
- ✓ An independent (ideally 3rd party) review and verification of the GHG inventory and supporting data is recommended (optional).

Reporting documentation

- ✓ Community scale GHG inventory, with a description of data source and methodology used publicly reported on the cCR.
- ✓ Local government operational GHG inventory, with a description of data source and methodology used publicly reported on the cCR.

MRV for Sub-step 3.2 Analyze and forecast

Measures

- ✓ Following the approved rules and regulations, forecast GHG emission trends for potential development scenarios.

Reporting documentation

- ✓ Publication of GHG emission projections covering at least the target year and business as usual for potential development scenarios, describing assumptions made *(this requirement may be fulfilled by including these contents in the output of 3.3)*

MRV for Sub-step 3.3 Compile Baseline Synthesis Report

Measures

- ✓ Arrange for a review by stakeholders to comment the GHG inventory and emissions forecasts.
- ✓ Based on the GHG inventory and emissions forecasts, compile the Baseline Synthesis Report, including a BAU scenario based on forecasts which support the city development plan.
- ✓ Consolidate the benchmarking process using data and information collected in steps 2 and 3.

Reporting documentation

- ✓ Description of stakeholder consultation process and result
- ✓ Baseline Synthesis Report
- ✓ Updated City Profile
- ✓ City performance reported on the cCR (including sectoral indicators for benchmarking purposes)

---

[1] GreenClimateCities programme by ICLEI → check online

In addition, a set of verification criteria was developed for this step:

- Was the GHG inventory compiled according to rules and regulations published by the coordinator of the process and/or the City Council?
- Was the Global Protocol for Community-scale GHG Emissions Inventories (or other widely recognised framework) used, to enable comparison with other local governments?
- Was the GHG inventory and forecast and Baseline Synthesis Report open for consultation with stakeholders before a final version was released?

💡 To learn more about the GreenClimateCities programme and verification criteria, please look up this resource - *From strategy to delivery: Measuring, Reporting, Verification (MRV) of Urban Low Emission Development. ICLEI's GreenClimateCities Handbook for Local Governments* → download

Verification at CDP

The CDP provides the following information on their work with verification:

"To ensure that the third-party verification activities undertaken by companies are broadly comparable, CDP requires verification to be completed in accordance with recognized verification standards. These standards must have a common set of attributes which are set out in the criteria below. Any third-party verification standard referenced in a company's submission to CDP will be assessed against these criteria to determine acceptability. Note that "Agreed upon procedures", "pre-assurance" or internal verification is not accepted as verification under the CDP scoring methodology.

Given the diversity of geographies and industries amongst CDP responders, and the evolution of standards, it is not possible to provide an exhaustive list of all standards that meet these criteria. However, to support companies in their disclosure process, CDP has produced a list of standards that have been deemed suitable for CDP reporting and a list of standards that are not considered appropriate. A third list includes those that are currently under review – CDP will endeavour to confirm whether these standards meet the criteria as soon as possible."

CDP also outlines the verification standards criteria, accepted verification standards, solutions providers, non-verification standards, and resources.

💡 To learn more about the CDP verification work, please visit the 'CDP Verification' → check online

💡 **Helpful resources:**

Global Protocol for Community-Scale Greenhouse Gas Inventories. An Accounting and Reporting Standard for Cities Version 1.1 by WRI, C40 and ICLEI → check online

GreenClimateCities Program: A pathway to low-emission, low-risk city development by ICLEI → download

From strategy to delivery: Measuring, Reporting, Verification (MRV) of Urban Low Emission Development. ICLEI's GreenClimateCities Handbook for Local Governments → download

CDP Verification Process → check online

2. Modelling

Modelling involves the use of models to estimate or project GHG emissions, assess the impact of climate policies, and evaluate the effectiveness of mitigation strategies. It is an essential phase in understanding complex systems, predicting future trends, and making informed decisions related to climate action.

Key modelling tools

There is a range of well-established tools, which can help cities manage and report emissions inventory data. They are very well documented and presented at the CDP website on Greenhouse Gas Emission Tools and Datasets for Cities and in the guidance with the same title. The presented tools are divided into three categories, depending on the city's climate journey stage: 1) Establishing an emission baseline; 2) Identifying specific sources of emissions; 3) Tracking progress overtime.

Below you can find a selection of most popular datasets and tools used by cities with a short description and a direct link to the tool:

CIRIS | City Inventory Reporting and Information System
→ check online

CIRIS is an accessible, easy-to-use and flexible Excel-based tool for managing and reporting city GHG inventory data. Based on the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC) standard, CIRIS facilitates a transparent calculation and reporting of emissions for all sectors: Stationary energy, Transportation, Waste, Industrial processes and product use (IPPU), Agriculture, forestry and other land use (AFOLU).

ClearPath
→ check online

ClearPath is the leading online software platform for completing greenhouse gas inventories, forecasts, climate action plans, and monitoring at the community-wide or government-operations scales. It assists local governments in assessing their current sustainability performance, identifying areas for improvement, and setting targets and strategies for future action. It covers various aspects of sustainability, including energy, greenhouse gas emissions, transportation, waste management, water, and more.

Carbon Monitor Cities
→ check online

Carbon Monitor Cities is an online CO_2 emissions dataset developed by a group of universities and climate technology firms. It provides near-real-time daily city-level CO_2 emissions data for 1500 cities in 46 countries.

CAPACITIES
Advancing national support
for climate neutral cities

P a g e |15

Economic case for decarbonising cities
→ check online

The economic case for decarbonisation tool is an Excel tool based on both top-down and bottom-up analysis that helps cities understand the societal economic case for reducing CO2 emissions in cities. It evaluates the CO2 reduction potential, air pollution reduction (NOx and PM), investments needed, cost savings, and other societal benefits generated for a number of sectors and 15 specific urban decarbonisation measures, relative to a baseline development. The tool was developed by Material Economics & EIT Climate-KIC.

ClimateOS
→ check online

ClimateOS is a climate action decision-making tool for cities developed by climate action technology company ClimateView. Their aim is to provide cities with the data intelligence needed to take effective climate action. As part of this service, ClimateOS provides pre-populated GHG emissions data for cities in selected countries.

EcoLogistics
→ check online

EcoLogistics Self-monitoring Tool is a calculation tool developed for cities to estimate their greenhouse gas emissions from urban freight transport. It allows the assessment of baseline and target scenarios wherein specific technologies or strategies are hypothetically implemented. The tool also acts as a monitoring tool for cities to make meaningful comparisons over time and with other cities in terms of urban freight emissions.

FutureproofedCities
→ check online

FutureproofedCities is an online city carbon management platform built by climate tech company Futureproofed to measure, reduce and report GHG emissions for cities. Futureproofed Cities supports the creation of GHG emissions inventories, climate goal setting, digital collaboration, monitoring of progress, and stakeholder engagement for over 200 cities worldwide.

Google Environmental Insights Explorer
→ check online

Google Environmental Insights Explorer (EIE) is a city emissions data tool developed by Google that uses Google Maps transport and building data to estimate GHG emissions data in these sectors for individual cities.

💡 **Helpful resources**

Understanding data and tools to accelerate city climate action. A Decision-making and Tools Project White Paper by the Global Covenant of Mayors for Climate & Energy (GCoM), Bloomberg Associates (BA) and World Resources Institute (WRI) → check online

Greenhouse Gas Emissions Tools and Datasets for Cities. Full Report (November 2022) by CDP → check online

Google EIE 2021 ICLEI Transportation Assessment Report

- Full version: https://iclei-europe.org/publications-tools/?c=search&uid=7BYvs1Vm
- Short version for policymakers: https://iclei-europe.org/publications-tools/?c=search&uid=WDZH3flr

3. Innovation in impact assessment

Innovation in impact assessment refers to the application of new or improved methods, approaches, and technologies to assess the social, economic, and environmental impacts of projects, policies, or initiatives. It involves adopting creative and forward-thinking approaches to enhance the effectiveness, efficiency, and comprehensiveness of impact assessments. There are quite many innovative impact assessment methodologies out there, so we decided to narrow down the selection to those that were mapped and used by the NetZeroCities platform. Better understanding of the NZC approaches by the national partners will hopefully help create more alignment across stakeholders and projects. More methodologies will be presented in the CapaCITIES learning portfolio (D2.3).

The new approaches include:

Systems innovation
Systems innovation is the deliberate and transformative change in complex systems to address societal challenges, promote sustainability, and achieve desired outcomes. It involves reimagining and redesigning the interconnected elements, relationships, and dynamics within a system to bring about systemic change. Systems innovation goes beyond incremental improvements and focuses on reshaping the fundamental structures, behaviours, and underlying assumptions of a system. The key characteristics and components of systems innovation include:
- Holistic perspective
- Systems thinking
- Collaboration and participation
- Experimentation and learning
- Policy and institutional change
- Long-term orientation

💡 Systems Innovation Climate Toolkit → check online (NetZeroCities portal)

Social innovation

Social innovation refers to the development and implementation of new ideas, strategies, products, services, or models that address social needs and create positive societal change. It involves finding innovative solutions to social challenges and improving the well-being of individuals and communities. Social innovation goes beyond traditional approaches and seeks to tackle systemic issues by engaging stakeholders, fostering collaboration, and promoting sustainable and inclusive outcomes.

💡 Social Innovation Toolkit → check online (NetZeroCities portal)

Strategic innovation programmes

A strategic innovation program is a structured and intentional effort to foster innovation, drive transformative change, and achieve strategic objectives. It involves the implementation of a coordinated set of initiatives, activities, and resources aimed at promoting innovation within a specific objective or focus area. A strategic innovation program typically incorporates long-term planning, resource allocation, and collaborative efforts to address complex challenges and seize new opportunities.

An excellent example of a strategic innovation programme is Viable Cities in Sweden.

Viable Cities is a programme focusing on the transition to climate-neutral and sustainable cities. Viable Cities aims to create transformative system change based on the mission Climate Neutral Cities 2030 with a good life for everyone within the planetary boundaries. The mission means that cities' climate transition should take place from a broad perspective, where social, ecological and economic sustainability is considered.

💡 Viable Cities. Strategic innovation programme → check online (NetZeroCities portal)

4. Example of the national GHG emission monitoring and reporting framework: FRANCE

Good understanding of the national GHG emission monitoring and reporting framework, including the position and role of local governments in the overall framework, can help national platforms identify key benefits and barriers for cities and address them accordingly. In order to get a better overview of the national GHG emissions monitoring and reporting framework, it is important to reflect on the following questions:

- Who are the key stakeholders across all levels of government?
- Who are the key non-governmental stakeholders?
- What are the relationships, dependencies and dynamics between all involved stakeholders?
- What are the communication channels that facilitate information exchange and data flow?
- How are the local governments embedded in the national framework?
- What are the benefits and barriers for local governments?

As a part of the CapaCITIES project, we encourage the national partners engaged in building national support structures to learn more about the national GHG emissions monitoring and reporting frameworks in their countries and map out concrete opportunities of how the national platform can mobilise support at the regional and national levels to support GHG emissions monitoring and reporting exercise at the local level. These can include clarifying roles and responsibilities across different levels, providing comprehensive guidelines and technical support, improving data collection mechanisms, establishing an integrated national reporting platform, providing financial support and others. At the same time, the national platforms can advocate for better integration of cities' monitoring and reporting in the overall national framework by identifying and communicating concrete benefits and sharing good practices.

In order to dive deeper into the benefits and challenges of the GHG emissions monitoring and reporting for both national and local governments, the CapaCITIES consortium organised in June 2023 a webinar on this topic. In the meeting, we had representatives from France, who shed light on the roles of different stakeholders in the overall GHG emissions monitoring and reporting framework in the country. They key messages included:

- There is a rich landscape of stakeholders across different governance levels that are involved in the GHG monitoring and reporting.
- Regional level institutions are playing a relevant role in the overall framework.
- Regional level institutions: 1) support local governments with the GHG emissions monitoring and reporting and the local level; 2) strive for better alignment of GHG guidelines and standards across different regions; 3) feed the local GHG emissions data back to the national level.

In order to dive deeper into the specificities of the French national GHG monitoring and reporting framework, we compiled relevant information below. For more details, we encourage you to watch the recording of the CapaCITIES webinar.

Mapping of relevant stakeholders across all governance levels

The key stakeholders in the national GHG emissions monitoring and reporting framework in France include:

<u>At the national level</u>

- **The Ministry of Ecological Transition** is responsible for formulating and implementing policies related to environmental protection, sustainable development, and climate change mitigation. They play a crucial role in overseeing the national GHG monitoring and reporting framework in France.

- **The French Environment and Energy Management Agency (ADEME)** is a public agency under the Ministry of Ecological Transition. They provide technical expertise, research, and financial support for sustainable development projects, including monitoring and reporting GHG emissions. ADEME is involved in developing methodologies, guidelines, and tools for GHG inventory compilation and reporting.

- **The French Environment and Energy Control Agency (DGEC)** is another agency under the Ministry of Ecological Transition. They are responsible for regulating and monitoring various aspects of environmental policies, including GHG emissions. DGEC oversees the implementation of national and international reporting obligations, ensures compliance with reporting guidelines, and supports the development of the national GHG inventory.

- **The French Statistical Office (INSEE)** is the national statistical agency in France. They collaborate with other stakeholders to collect and compile data related to GHG emissions from various sectors, including industry, energy, transportation, agriculture, and waste. INSEE provides data and statistical expertise to support the national GHG inventory and reporting efforts.

<u>At the regional level</u>

- **The Network of Regional Energy and Environment Agencies (RARE)** is a non-profit association, which brings together regional energy and environment agencies and observatories (OREC), as well as any structure that acts on missions of general interest in the field of sustainable development at regional level, in metropolitan France and overseas. In this sense, the RARE constitutes a gateway on energy and environmental themes between actors in the sector throughout France.

- **Regional Energy and Climate Observatories (OREC)** in France are regional institutions that focus on monitoring and analysing energy consumption, GHG emissions, and climate-related data at the regional level. They play a key role in supporting regional energy and climate policies, as well as facilitating decision-making processes. The ORECs are collaborative platforms that bring together various stakeholders, including regional authorities, research institutions, energy agencies, and local communities.

Zooming in on the regional level stakeholders

Case study 1: *The Network of Regional Energy and Environment Agencies (RARE)*

The Réseau des Agences Régionales de l'Energie et de l'Environnement (RARE) is a network of regional energy and environment agencies and structures working in the general interest to promote sustainable development.

Since 1995, RARE has been providing support to regional energy and environment agencies, promoting their expertise and encouraging the sharing of experience in assisting local and regional authorities with their sustainable development policies. The RARE has four objectives:

- To act as an interface on issues relating to sustainable development policies between regional agencies and institutional players at national level (Ministry of Ecological Transition, ADEME, Régions de France, etc.),
- To make the most of the wealth of expertise within the agencies through joint awareness-raising, promotion, evaluation and observation initiatives,
- To provide a forum for regional agencies to share experience, knowledge and expertise,
- To develop shared tools and harmonise methodological approaches between agencies.

💡 Learn more from the slides included in the **Annex** and at www.rare.fr

Case study 2: *Air Pays de La Loire*

Air Pays de La Loire is an association accredited by the Ministry of Ecological and Inclusive Transition to monitor air quality in the Pays de la Loire region 24/7. It keeps the authorities and the public informed by disseminating all its results on www.airpl.org and via newsletters in the event of pollution peaks.

Its areas of expertise include:
- Outdoor air quality: real-time measurements, air quality forecasts, mapping, studies around industries, in agricultural areas, etc.
- Indoor air quality: measurements in establishments open to the public, support for local authorities in building construction, specific studies, etc.
- Emissions, energy, climate: regional inventory of emissions, greenhouse gases and energy data (BASEMIS), decision-making support for local authorities (local climate, air and energy plans), etc.
- Pollens: real-time dissemination of results for the region.

Organised on a multi-partner basis, Air Pays de la Loire brings together four groups of partners: the state, local authorities, industry and environmental and consumer protection associations.

Air Pays de la Loire brings together teams of meteorological technicians, research managers and engineers in atmospheric physico-chemistry, modelling, energy-climate, communications and support functions.

💡 Learn more from the slides included in the **Annex** and at www.airpl.org

About the BASEMIS

BASEMIS is a detailed inventory of emissions and energy data for the Pays de la Loire region. This inventory of atmospheric pollutants, GHG emissions and energy consumption currently covers the years 2008 to 2018 and is updated every two years.

<u>Methodology</u>
The BASEMIS method:

- is based on a territorial accounting methodology, used for pollutants and GHGs: this involves counting emissions at the place where they are emitted, on a delimited territory.
- is used by Approved Air Quality Monitoring Associations since it has all its advantages in terms of territorialisation of emissions. The emissions inventory can be also used for modelling purposes, in an air quality forecasting model for example.
- inventory has been carried out for each year since the reference year 2008.
- includes all emitting sectors.
- makes it possible to compare emissions between different territories as well as their evolution over time.
- follows the recommendations of the guide written by the Territorial Inventory Coordination Center (PCIT).
- is consistent with the <u>method used at the national level by CITEPA</u> to carry out the inventory of emissions at the scale in France.

💡 Learn more at: <u>www.airpl.org/emissions-climat/methode-basemis</u>

5. Recommendations for the national level

A closer collaboration between different levels of government in the area of GHG emissions monitoring and reporting can bring about many tangible benefits, including better integration of climate action at the local, regional and national level, more efficient tracking of overall emission reduction efforts, better integrated learning process that supports decision-making and policy development, and others. This is why, national governments should strive for a better integrated and more comprehensive national GHG monitoring and reporting frameworks based on accessibility of data, aligned frameworks and standards, as well as efficient communication and information flow between different levels of government.

There are several ways that national governments can help cities measure and report their data:

Guidance and Capacity Building
National governments should develop clear guidelines and provide technical assistance to help cities in GHG emissions monitoring, reporting, and verification. This includes providing standardised methodologies, reporting templates, and tools that makes the process simpler. Capacity-building programs, trainings, and knowledge-sharing platforms can also enhance cities' understanding and skills in data collection, calculation, and reporting.

Data Sharing Mechanisms
National governments should facilitate data sharing between relevant stakeholders, including cities, national agencies, and verification bodies. This can involve developing data platforms where cities can access relevant data sources and share their emissions data in a secure way. Access to reliable and comprehensive data supports accurate reporting and improves the quality of GHG inventories. That is why, national governments should make national-level datasets free, public, easily accessible, updated on an annual basis, and aligned with global frameworks and standards (e.g. the GHG Protocol), help unblock barriers to accessing private data (e.g. from utilities and private companies), as well as support cities to collect hard-to-measure data such as consumption-based emissions, agriculture, forestry and other land use. National governments can also leverage their authority to promote voluntary city climate and environmental disclosure and action. A good example is the [CDP Government Endorsement](#).

Financial Support
National governments should allocate financial resources to support cities in GHG monitoring, reporting, and verification activities. This can include funding for capacity-building initiatives, data collection equipment, software tools, and participation in verification processes. Financial support demonstrates the commitment of national governments to enable cities to fulfil their reporting obligations effectively.

Collaboration and Networking
National governments should facilitate collaboration and networking among cities by organising regular forums, workshops, and conferences. These platforms enable cities to share experiences, challenges, and best practices in GHG monitoring, reporting, and verification. National governments can also support the establishment of networks or associations that allow cities to collaborate, exchange knowledge, and learn from each other's innovative approaches.

Aligned Reporting Processes

National governments should work to align reporting processes and minimise administrative burdens for cities. This includes aligning reporting requirements with international standards and frameworks, simplifying data collection and reporting procedures, and reducing duplication of efforts. Streamlining processes enhances efficiency, encourages greater participation from cities, and improves the overall quality of reporting.

> 💡 **Helpful resources**
>
> Collaborative Climate Action - a prerequisite for more ambitious climate policy → download
>
> The Multilevel Climate Action Playbook - Policies and Enablers for All Levels of Government → download

6. Recommended resources

Title	Organisation	Brief description	Link
Climate Impact Indicators	NetZeroCities	This NZC deliverable aims to give an overview of all the relevant frameworks that measure Greenhouse Gas Emissions for cities and analyse them with regard to both their usability for the NZC MEL framework and for improvement in data availability, methodologies used, processing and display of data for reporting and communication.	Link
Collaborative Climate Action – a prerequisite for more ambitious climate policy	Partnership for Collaborative Climate Action	The report outlines the necessity for more ambitious and well-coordinated climate action across levels of government, introduced as collaborative climate action (CCA), and the important role that regions and cities play in attaining national and international climate goals. When all levels of government utilise their competences, tasks, budgets, experts, contacts and cooperation partners in a targeted and coordinated manner, they can achieve more together than each actor would alone.	Link
Common Reporting Framework	Global Covenant of Mayors	Local governments committed to GCoM pledge to implement policies and undertake measures to: (i) reduce/limit greenhouse gas emissions, (ii) prepare for the impacts of climate change, (iii) increase access to sustainable energy, and (iv) track progress toward these objectives. In order to ensure solid climate action planning, implementation and monitoring phases, as well as streamline measurement and reporting procedures, a set of new global recommendations were developed with the intention to be flexible to meet specific local or regional circumstances while also allowing for global aggregation and comparison of data	Link
Concept for an Comprehensive Indicator Framework	NetZeroCities	This deliverable D2.4.1 presents the concept for an overarching NetZeroCities indicator framework allowing for a holistic and multidimensional assessment of progress towards climate-neutrality among Mission Cities. The aim of this deliverable is to create an integrated framework of indicators and support the evaluation of Climate City Contracts (CCCs) and the monitoring of implementation of 2030 Climate Neutrality Action Plans and Investment Plans as well as of the NetZeroCities city pilots.	Link
From strategy to delivery:	ICLEI	This handbook aims to guide the local	Link

ICLEI's GreenClimateCities Handbook for Local Governments		government's approach to effectively address climate change, with a strong focus on mitigation. Yet, it can also be used for integrated sustainable development, stimulating the local green economy, and many other topics, using climate action as an entry point. It can also help to enhance the understanding of key partners of the role of local governments, especially national governments. The guidance offered here can easily connect to national processes to show how local climate action is (or can be) connected to the Nationally Determined Contributions (NDCs), potentially even to help raise the level of ambition.	
Deutsche Smart Cities auf dem Weg zur Google Environmental Insights Explorer Datennutzung [in German]	ICLEI	This manual is aimed at municipalities that are interested in the use of data from Google's Environmental Insights Explorer (EIE) from Google, and illustrates how this data can support climate change planning processes, especially in the transport sector. A step-by-step guide illustrates the process from internal from internal coordination to the use of the data.	Link
Greenhouse Gas Emissions Tools and Datasets for Cities. Full Report	CDP	This technical report aims to provide an overview of GHG emissions monitoring tools, datasets and approaches that can provide cities across the globe with recent, community-wide emissions data they can use to build their inventories. Cities are at different stages on the climate action journey and their emissions data needs change as they progress on this journey: from having no emissions data and needing a starting point, to developing capacity to collect data but requiring data to fill in the gaps and track emissions changes over time.	Link
Identified city needs for MEL,metrics, indicators	NetZeroCities	This deliverable reports the results from project task 2.1.3 "Cities needs assessment", which was designed to identify the cities' needs regarding Monitoring, Evaluation and Learning activities. Monitoring, evaluating progress and learning on emission reduction targets and socio-economic co-benefits and impacts of the transition to Climate Neutrality is critical in order to inform and guide climate action. However, the NetZeroCities, with its 100 participating cities, will go beyond current practice by combining different GHG reporting frameworks into one platform and by addressing emerging fields of evaluation, such as, Scope 3 emissions, social innovation, nature-based solutions, governance, democratic participation, and finance. The principal aim of this deliverable is thus to inform the development of the Monitoring, Evaluation & Learning (MEL) framework and by extension, the	Link

		EU Mission: Climate-Neutral and Smart Cities.	
Indicators for capital / finance needs and replication potential	NetZeroCities	The indicators for capital and finance needs will form an important part for the NetZeroCities for their Cost, Impact & Capital Planning as well as their Impact Monitoring Framework as part of the Investment Plan. The economic case looks different for different climate mitigation measures; some provide great savings while others carry significant costs. In general, mitigation measures require substantial upfront investments, coupled with capital costs over time, whilst the savings arise from reduced costs of operations.	Link
Multilevel Climate Action Playbook - Policies and Enablers for All Levels of Government	Global Covenant of Mayors	Due to the global climate emergency, there is an unprecedented need to collectively scale up climate action in a well-coordinated approach that is facilitated by multilevel governance for a multi-actor partnership. Innovative approaches in this regard are being implemented around the globe – with several cases shared in this second edition of the Playbook.	Link
Report on assessment methodologies for planning and monitoring the reduction of GHG emission through the use of urban Nature-based Solutions	NetZeroCities	This deliverable is aimed at assessing the reduction of GHG emissions through the use of urban Nature-based Solutions (NBS). It is the outcome of the work focused on assessment methodologies for planning GHG emissions reduction through the use of urban NBS, including impact monitoring with respect to emissions reduction.	Link
Report on Indicators & assessment methods for social innovation action plans	NetZeroCities	This report presents the rationale, framework, methodology and instruments to evaluate the impact of the social innovation categories of the action plans in thirty selected NZC project pilot cities. It specifies the importance of social innovation in NetZeroCities, the intervention logics, indicators, metrics and tools for data collection and data analysis at both the general action plan level and that of the individual social innovation initiatives. Specifically, the developed methodology focuses on measuring the effectiveness, efficiency, relevance, replicability, and scalability of the social intervention in the future pilots devising 10 categories of interventions and producing a set of intervention logics and indicators for the general case and for each related category. Further, the research team mapped to the general case and	Link

		to each category the indicators elaborated in existing evaluation frameworks. The next step of the work will be to select and adapt indicators to the city cases.	
Understanding data and tools to accelerate city climate action. A Decision-making and Tools Project White Paper	Global Covenant of Mayors	The Global Covenant of Mayors for Climate & Energy (GCoM), together with Bloomberg Associates (BA) and World Resources Institute (WRI) engaged with city practitioners and experts from multiple relevant disciplines to better understand the obstacles that cities face in reducing greenhouse gas (GHG) emissions and the data and tools that can play a role in accelerating their progress. Through this assessment of city needs, the available data, and the tools landscape across all stages of climate action, we are seeking to improve the way in which cities connect to high-impact, user-friendly tools that eliminate barriers to climate-related data collection, planning, and monitoring.	Link

CAPA**CITIES** Advancing national support
for climate neutral cities

P a g e | 29

Annex

Case study 1: The Network of Regional Energy and Environment Agencies (RARE)

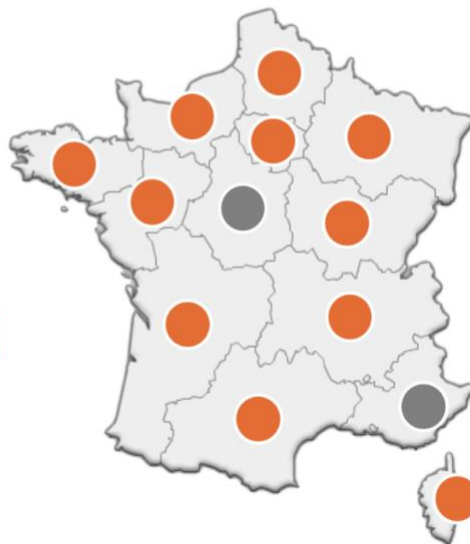RÉSEAU DES AGENCES RÉGIONALES
DE L'ENERGIE ET DE L'ENVIRONNEMENT

GHG Monitoring
The **role of regional observatories and RARE in France**

Nadège AUSTIN
June 12, 2023

regional energy and climate observatories (OREC)

- 15 regional energy and climate observatories in France
- 12 are members of RARE as of Jan. 1st, 2023

Established OREC, member of RARE

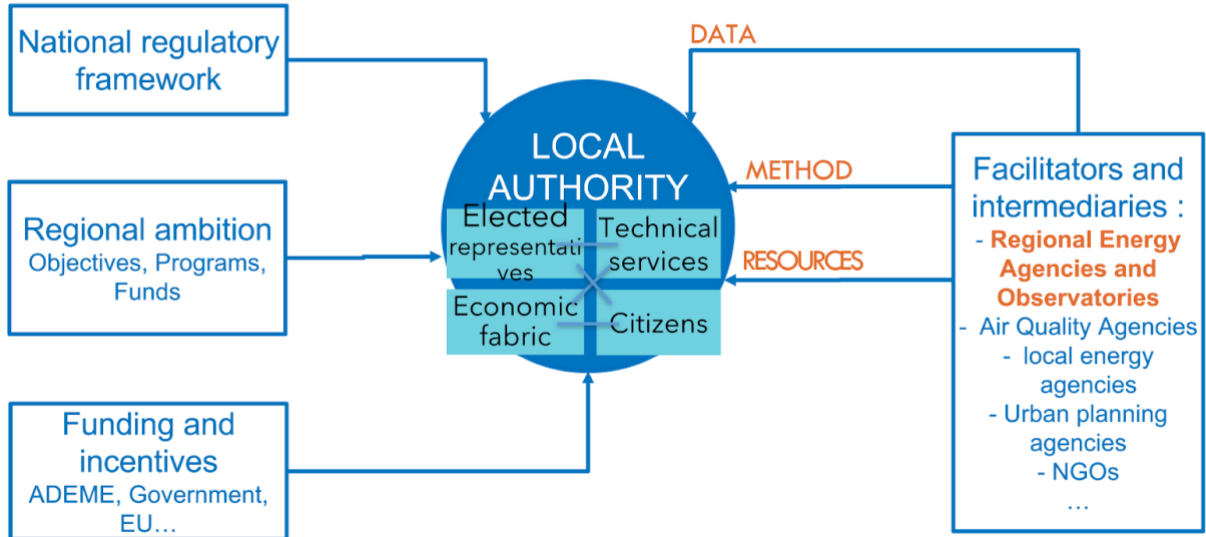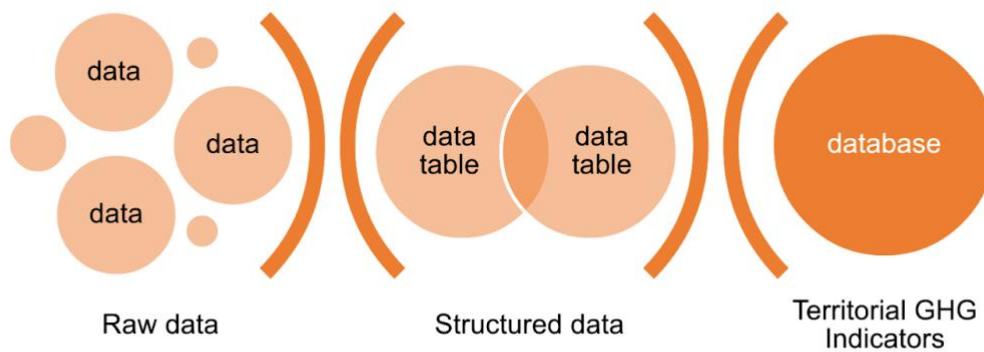Established OREC, not a member of RARE

No established OREC

GUYANE
MARTINIQUE
GUADELOUPE
LA REUNION
MAYOTTE

RARe
RÉSEAU DES AGENCES RÉGIONALES DE L'ENERGIE ET DE L'ENVIRONNEMENT

Articulation of national, regional and local actors in France

National regulatory framework

Regional ambition
Objectives, Programs, Funds

Funding and incentives
ADEME, Government, EU…

LOCAL AUTHORITY
- Elected representatives
- Technical services
- Economic fabric
- Citizens

DATA

METHOD

RESOURCES

Facilitators and intermediaries :
- **Regional Energy Agencies and Observatories**
- Air Quality Agencies
- local energy agencies
- Urban planning agencies
- NGOs
…

RARe
RÉSEAU DES AGENCES RÉGIONALES DE L'ENERGIE ET DE L'ENVIRONNEMENT

Data engineering, the core business of observatories

data | data | data

data table | data table

database

Raw data | Structured data | Territorial GHG Indicators

Shared data services provided by ORECs to local authorities

territorial GHG emissions reports

calculation of renewable energy potentials

customized dashboards

energy and GHG indicators

impact assessment of actions

trajectory management tools
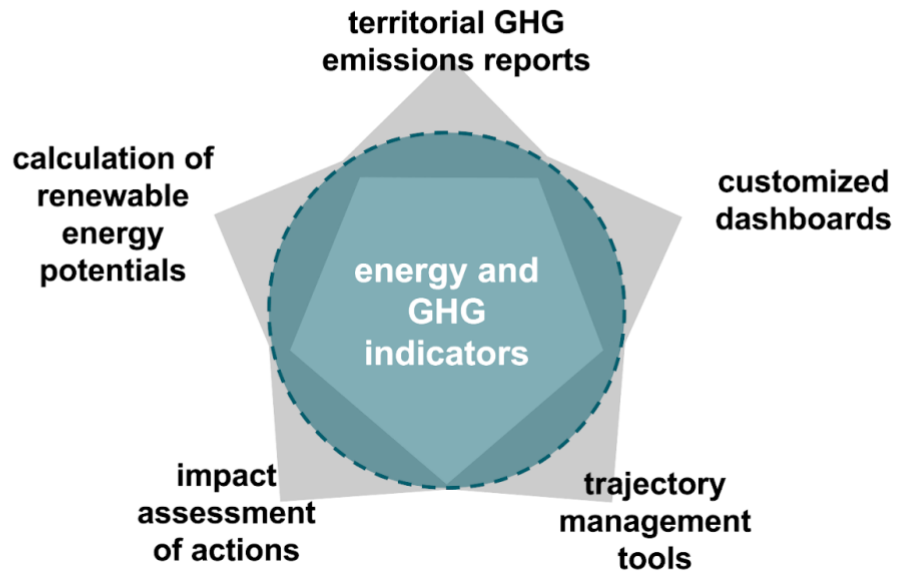
TerriSTORY® : an example of data service created by a regional Energy and Climate Agency
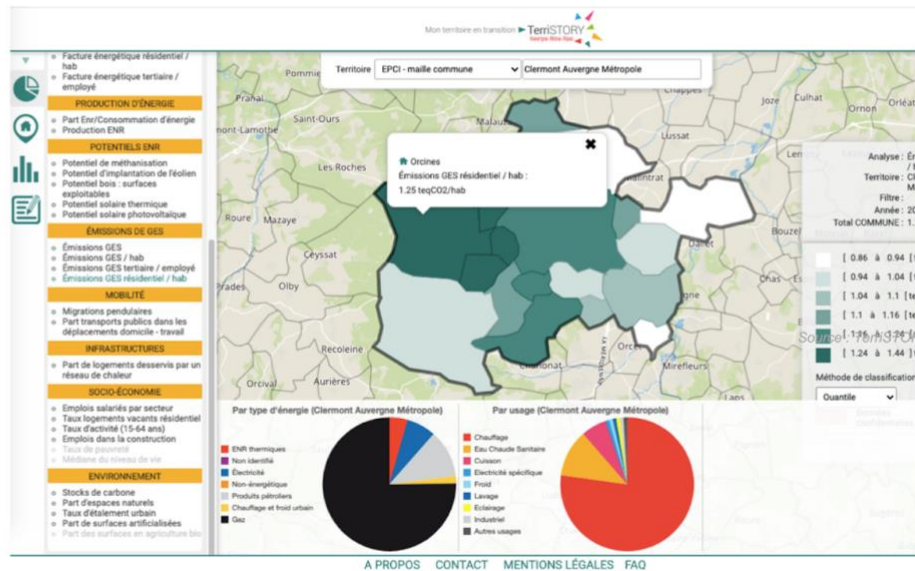
Funded by the European Union

The national network : RARE

RARE
RÉSEAU DES AGENCES RÉGIONALES
DE L'ÉNERGIE ET DE L'ENVIRONNEMENT

A network of **expertise** and **know-how** dedicated to transitioning at the local level

Ressources / Waste

Environment / Health

Climate

Transition management

Energy

Biodiversity

Water

Linking territorial and national monitoring

RARE
RÉSEAU DES AGENCES RÉGIONALES
DE L'ÉNERGIE ET DE L'ENVIRONNEMENT

ETL

OREC 1 · OREC 2 · OREC 3 · OREC 4 · GT · GT

Methodological referencial

database

Indicators

Data visualisations · Tools · Studies or analyses

Promoting a shared and open methodology for ORECs

Référentiel méthodologique v1.0

Trier   Défaut   ↓

Le référentiel méthodologique des Observatoires régionaux de l'énergie et du climat (OREC) a pour but de décrire les pratiques pour la production des indicateurs territoriaux de pilotage des politiques énergétiques et climatiques mis à disposition aux collectivités locales. Les méthodes qui y sont décrites sont basées sur les 'meilleures pratiques' connues à ce jour. Elles sont l'aboutissement de la première phase de 'convergence méthodologique' lancée en 2021 à l'initiative du RARE et co-pilotée par l'ADEME, le Ministère de la Transition Énergétique, le Haut Conseil pour le Climat, Atmo France, et Régions de France.

Ce référentiel est voué à être mise à jour en continu en fonction de l'avancée de l'expertise acquise par les OREC, de l'évolution des besoins des territoires ou des opportunités d'exploitation de nouveaux jeux de données. La version actuelle (163 indicateurs) a été validée par le Comité de pilotage du projet le 7 avril 2025.

0_Mode d'emploi de ce référentiel

1.1.01_Biomasse solide

1.1.02_Biogaz

1.1.03_Géothermie, aérothermie et PAC

1.1.04_Solaire thermique

1.1.05_Incinération des déchets

Présentation générale de la filière
L'incinération est un procédé à vocation d'élimination ou de fin de vie des matières reposant sur...

Approche(s) méthodologique(s) de référence(s)
L'approche de référence applicable pour établir le bilan physique de la filière incinération des ...

Production des indicateurs territoriaux de la filière
Liste des indicateurs Nom Unité Définition littérale Nombre d'installations ...

Liste des indicateurs

Nom	Unité	Définition littérale
Nombre d'installations	Nbr	Nombre d'incinérateurs installés et en fonctionnement
Parc installé (électrique)	MWe	Cumul de puissances des Groupes Turbo Alternateurs des incinéra-teurs installés et en fonctionnement
Parc installé (thermique)	MWth	Cumul de puissances des **échangeurs primaires** des incinérateurs ins-tallés et en fonctionnement
Tonnages incinérés	Tonnes	Tonnes de déchets incinérés dans les installations disposant d'un sys-tème de valorisation énergétique
PCI moyen	MWh PCI/tonne	Pouvoir calorifique inférieur moyen annuel des déchets entrants en in-cinération et valorisés énergétiquement
Consommation d'énergie primaire inciné-rée localement	MWh PCI	Énergie primaire + tonnes déchets x PCI + ressources fossiles consommées + électricité consommée
Production de chaleur brute	MWh	Énergie produite par l'incinérateur, sortie chaudière
Chaleur vendue	MWh	Énergie livrée en réseau de chaleur (sortie de l'échangeur secondaire)
Vapeur vendue	MWh	Vapeur vendue directement (cas particulier)
Chaleur autoconsommée	MWh	Chaleur issue de la combustion réutilisée pour le fonctionnement du four
Chaleur fatale	MWh	Chaleur brute – chaleur autoconsommée – chaleur vendue
Électricité vendue	MWh	Électricité produite par le Groupe Turbo Alternateur et injectée sur le réseau de distribution
Électricité autoconsommée	MWh	Électricité produite par le Groupe Turbo Alternateur consommée par l'incinérateur
Autoconsommation d'énergie fossile	MWh PCI	Énergie (gaz, produits pétroliers) consommés par le four
Autoconsommation électrique	MWh	Électricité de réseau consommée par l'incinérateur
Performance énergétique moyenne	%	Pe = ((Ep–(Ef+Ei))/0.97x(Ew+Ef))xFFC

Promoting methodological innovation

RARE RÉSEAU DES AGENCES RÉGIONALES DE L'ENERGIE ET DE L'ENVIRONNEMENT

The carbon footprint of Brittany residents

Un Breton émet 9,11 tonnes équivalent CO$_2$ par an dont la moitié, à l'étranger

SURTOUT POUR CONSOMMER DES BIENS ET SERVICES

Émissions associées à la consommation de biens et services par les Bretons

83 % Consommation de biens et services

17 % Chauffage et véhicules particuliers

50 % DES ÉMISSIONS ONT LIEU À L'ÉTRANGER

Origine géographique des émissions de gaz à effet de serre

17 % en Bretagne (chauffage et véhicules)

34 % en France et en Bretagne (Économie)

49 % ailleurs dans le monde

50 % Achats de matières premières et de composants des entreprises françaises et bretonnes

50 % Achats de biens et services étrangers directement par les Bretons

OEB OBSERVATOIRE DE L'ENVIRONNEMENT EN BRETAGNE

Exiobase 3.8 (2018), Insee (dont enquête budget des familles 2017), calcul de l'Observatoire de l'environnement en Bretagne (OEB_Empreinte v1.2) • Réalisation : Observatoire de l'environnement en Bretagne, avril 2021

Reaching for the stars !

✓ 100% reliable indicators to build systemic responses

✓ A fully open network of treatment knowledge powered by an intelligent community

✓ Subsidiarity of responses in GHG monitoring

✓ Sources of free data and from crowdsourcing approaches

get cape.   wear cape.   fly.

Thank you for your attention !

energie@rare.fr – 06 20 92 19 12

RARE

RÉSEAU DES AGENCES RÉGIONALES
DE L'ENERGIE ET DE L'ENVIRONNEMENT

A network of
expertise
and **know-how**
dedicated to transitioning
at the local level

www.rare.fr

Casestudy 2: Air Pays de La Loire

BASEMIS®
EMISSIONS INVENTORY IN THE FRENCH REGION OF PAYS DE LA LOIRE

GHG emissions data monitoring and reporting for climate neutral cities: How can the national level get more involved?

air | pays de la loire
www.airpl.org

MONITORING AIR QUALITY AND CALCULATING GHG EMISSIONS IN FRANCE

air | pays de la loire
www.airpl.org

MINISTRY FOR ECOLOGICAL TRANSITION

« LAURE » LAW
Law on air and rational use of energy (1996)

ATMO France NATIONAL FEDERATION Accredited associations for the monitoring of air quality

AIR PAYS DE LA LOIRE

Image source : touteleurope.eu

2

WHAT IS AIR PAYS DE LA LOIRE ?

air | pays de la loire
www.airpl.org

Air Pays de la Loire is the accredited association for the monitoring of air quality in the French region of Pays de la loire

air | pays de la loire

Air pollutants GHG

Emissions Concentrations

Measurement Monitoring Modeling

Created in 1980 35 EXPERTS

3

CALCULATING EMISSIONS & MONITORING CONCENTRATIONS

air | pays de la loire
www.airpl.org

EMISSIONS

Amount of pollution produced by a source for a definite amount of time (mg/h)

« what comes out of a smokestack, a car.. »

BASEMIS

transportation
accumulation
dispersion
transformation

CONCENTRATIONS

Amount of pollution in a volume of air (µg/m³)

« the air we breathe »

4

BASEMIS® : A REGIONAL EMISSIONS DATA INVENTORY

air pays de la loire
www.airpl.org

5

BASEMIS® : A REGIONAL EMISSIONS DATA INVENTORY

air pays de la loire
www.airpl.org

Source : Air Pays de la Loire, OpenStreetMap

Territory inventory on a **communal scale** in the Pays de la Loire region

Energy consumption

Greenhouse gas emissions

Atmospheric pollutants emissions

Renewable energy production

6

BASEMIS® : A REGIONAL EMISSIONS DATA INVENTORY

Database of energy consumption, GHG emissions, pollutants emissions & renewable energy production in Pays de la Loire

398 millions data

➔ 12 years worth of data + 1 provisionnal year (2021)

➔ 1 236 cities

➔ 4 levels of data (region, departement, county, city/town)

➔ 203 requests for emissions data on specific territories in 2022

METHODOLOGY

air pays de la loire
www.airpl.org

DATA COLLECTION

- Measurements and industry data reporting

- Statistical data (municipality, department, region)

- Meteorological data

- Road traffic

DATA PROCESSING

Emission factors and calculation models

Processed using the CITEPA national methodology

DATA VALORIZATION

Fine scale inventory of :

-Energy consumption

- Renewable energy production

- Greenhouse gas emissions

- Atmospheric pollutants in Pays de la Loire

8

BASEMIS® : A REGIONAL EMISSIONS DATA INVENTORY

air pays de la loire
www.airpl.org

Tableau de bord des émissions

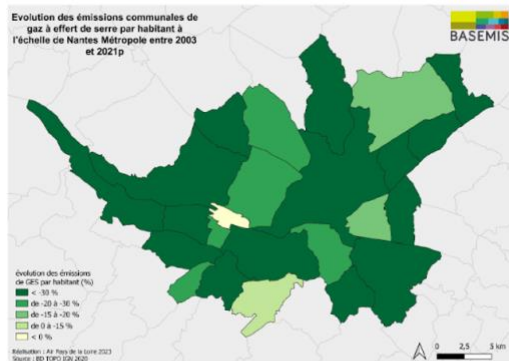Gaz à effet de serre   Consommation d'énergie   Production d'énergie renouvelable   Polluants atmosphériques

Émissions de GES totales en 2021 (kteqCO2)
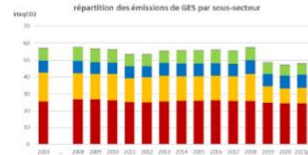

Pays de la Loire

Sélectionner une année d'inventaire   2021 ▾   valider

air pays de la loire
www.airpl.org

L'année 2021 est provisoire. Elle a été ajoutée dans cette version 7 de BASEMIS® afin de répondre au mieux au besoin de disposer de données les plus récentes.

Par secteur (2021)

- Agriculture
- Transport routier
- Industrie (hors branche énergie)
- Résidentiel
- Tertiaire
- Déchets
- Branche énergie
- Autres transports

27 260 kteqCO2

Par énergie (2021)

- Produits pétroliers et autres
- Hors énergie
- Gaz Naturel
- Électricité
- Chaleur issue de réseau
- Bois-énergie (EnR)
- Autres énergies renouvelables (EnR)

27 260 kteqCO2

Évolution 2008 - 2021 et objectifs à 2030 et 2050 (SNBC2)

Évolution 2008 - 2021 des puits de carbone*

EXAMPLE OF CITY-LEVEL EMISSIONS DATA

air pays de la loire
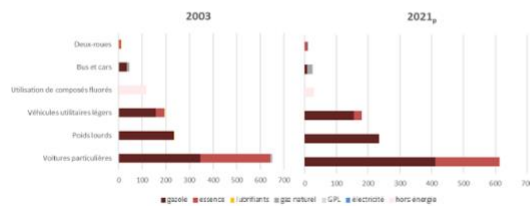www.airpl.org

Évolution des émissions communales de GES

Evolution des émissions communales de gaz à effet de serre par habitant à l'échelle de Nantes Métropole entre 2003 et 2021p

BASEMIS

évolution des émissions de GES par habitant (%)
- < -30 %
- de -20 à -30 %
- de -15 à -20 %
- de 0 à -15 %
- < 0 %

Réalisation : Air Pays de la Loire 2023
Source : BD TOPO IGN 2020

0 2,5 5 km

🚜🌾🐄 **Agriculture**
Émissions de GES par sous-secteur

2 %
GES 2021p

répartition des émissions de GES par sous-secteur

- Sylviculture
- Culture
- Tracteurs
- Consommation d'énergie - bâtiments agricoles
- Elevage

🚗 **Transports routiers**
Émissions de GES par type de véhicule et combustibles

46 %
GES 2021p

2003   2021p

- Deux-roues
- Bus et cars
- Utilisation de composés fluorés
- Véhicules utilitaires légers
- Poids lourds
- Voitures particulières

■ gazole ■ essence ■ lubrifiants ■ gaz naturel ■ GPL ■ électricité ■ hors énergie

10

TEO: Loire Observatory of Energy and Ecological Transition

Created in January 2018, TEO is an association whose members are the state (DREAL des pays de la Loire), the Regional Council of Pays de la Loire, the Agency for Ecological Transition (ADEME), Air Pays de la Loire , ENEDIS, RTE, GRDF and GRTgaz, Pays de la Loire Energy Territory.

The observatory aims to improve territorial knowledge on energy management, the reduction of greenhouse gas emissions, the development of renewable energies and adaptation to climate change, as well as in terms of waste prevention and management and the circular.

WORKING & REPORTING TO THE NATIONAL LEVEL

air pays de la loire www.airpl.org

ATMO France NATIONAL FEDERATION

High Council on Climate (HCC)

Similar work in all regional agencies (following the national framework)

National methodology (CITEPA)

Regular meetings & sharing best practices

Reporting local emissions data to
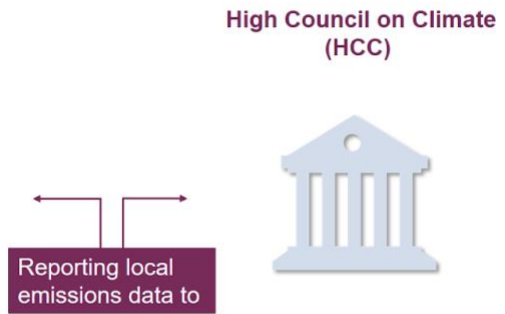
13

HOW LOCAL LEVEL EMISSIONS DATAS ARE EMBEDED IN THE NATIONAL FRAMEWORK
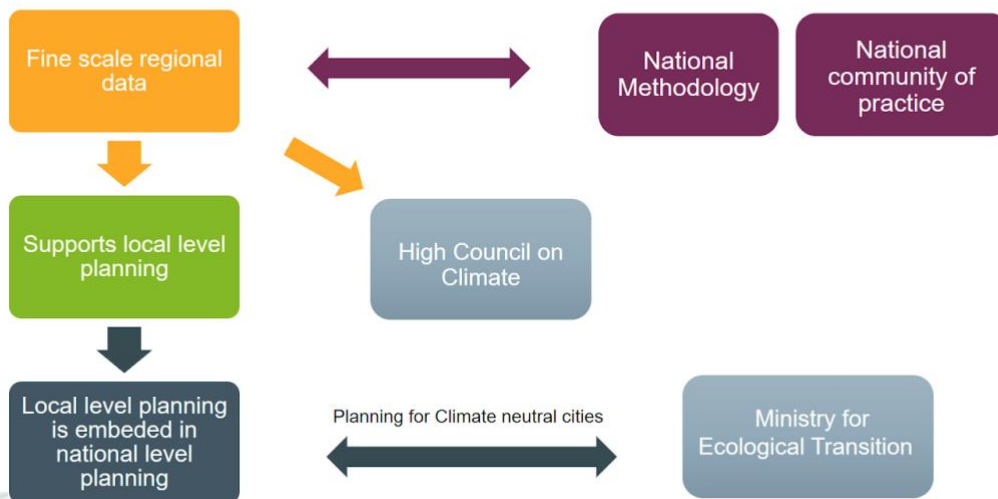
air pays de la loire www.airpl.org

Fine scale regional data

National Methodology

National community of practice

Supports local level planning

High Council on Climate

Local level planning is embeded in national level planning

Planning for Climate neutral cities

Ministry for Ecological Transition

14

CAPACITIES
Advancing national support
for climate neutral cities

P a g e | 42

www.airpl.org

newsletter
indices et alertes

@airpl_org

Air Pays de la Loire

Air Pays de la Loire

data.airpl.org

air pays de
la loire
www.airpl.org