Welcome to the webinar: Emissions Inventories - To measure before you act

One Planet City Challenge (OPCC) 2023-2024

A friendly biannual competition to inspire cities to take climate action. You'll be able to join through the CDP-ICLEI track in April

Webinar series 2023: Mitigating climate change-how to build a plan

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Time to (re-) join the OPCC

- We aim to **democratize global scientific results** (i.e. IPCC) and make them easily accessible to **all** local government, in our **individualized Feedback Report**

- Join by **reporting to a standardized international platform** (CDP-ICLEI).

- This opens up the **global cities arena**, and allows you to 'stand up' and be counted in support of the Paris Agreement and the global climate negotiations.

- We **celebrate frontrunners** through **solutions stories**, and use them as a tool to accelerate the climate transition.

- **We collaborate and align with other city networks** such as the Global Covenant of Mayors, ICLEI, C40 & CDP

- Participant survey: **83%** like to join again. **86%** recommend to others

One Planet City Challenge (OPCC) Webinar Series on Mitigating Climate Change

Emissions Inventories - To measure before you act

21 June 2023

Emissions Inventory Webinar Agenda

- Introduction to ICLEI Africa
- Introduction to emissions inventories
  - What is an emissions inventory, and what should be included in it?
  - What information cities need to collect
  - Known challenges and how to overcome them
  - Using proxy data
- The importance of science-based targets for cities, and why this is so critical in developing an emissions inventory
- Reporting to the CDP-ICLEI Track
- City experiences
- Questions and discussion

Introduction to ICLEI Africa

Introduction to ICLEI

Low-emission development

Nature-based development pathway

Equitable and people-centered development pathway

Resilient development pathway

Circular development pathway

ICLEI – Local Governments for Sustainability is a global network working with **more than 2500 local and regional governments** committed to sustainable urban development. **Active in 125+ countries**, we influence sustainability policy and drive local action for low emission, nature-based, equitable, resilient and circular development through peer exchange, partnerships and capacity building to create systemic change for urban sustainability.

ICLEI has put 'urban' firmly on the sustainability agenda, working with and effectively advocating for local and subnational governments in the global arena for over 30 years.

About ICLEI Africa

The immense, interconnected urban sustainability challenges our world, and our continent in particular, currently face need to be tackled in an integrated, inclusive way with tenacity, boldness and proven expertise.

Our ICLEI Africa cities and regions are doing just that.

Our **ICLEI Africa Secretariat** serves and supports these frontrunner cities and regions in Africa, with our growing team of passionate multi-talented experts and strong network of partners.

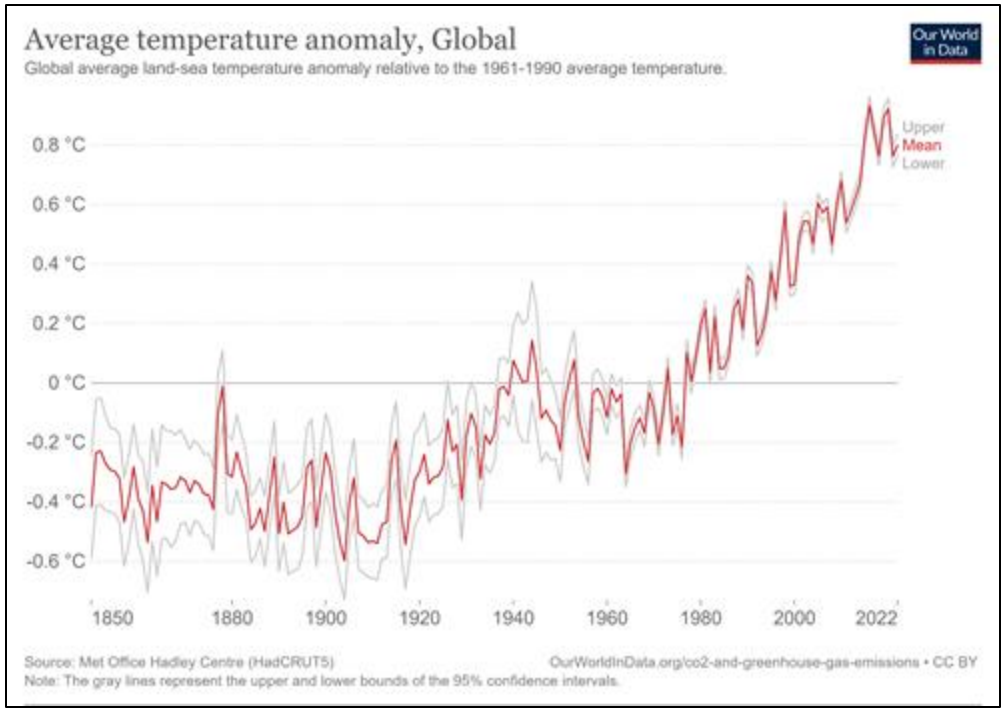
At ICLEI Africa, we work across the various development agendas, aligning with African and global policies, and contextualising our work within the realities of our continent. We reach over **450 cities and regions**, influencing sustainability policy and driving local action for low emission, nature-based, equitable, resilient and circular development.

Introduction to emission inventories

What is an emissions inventory?

- The first step for cities in climate action planning is to **identify and measure where their emissions come from**, by developing a greenhouse gas emissions inventory.
- A greenhouse gas (GHG) inventory, also known as a carbon footprint assessment, is a **quantified list of greenhouse gas emissions and emission sources**.
- It is a strategic tool for understanding, managing and communicating emissions resulting from an organizations activities, and can be used as the **basis for action planning and reduction of a city's carbon emissions**.

Why is this important to measure?



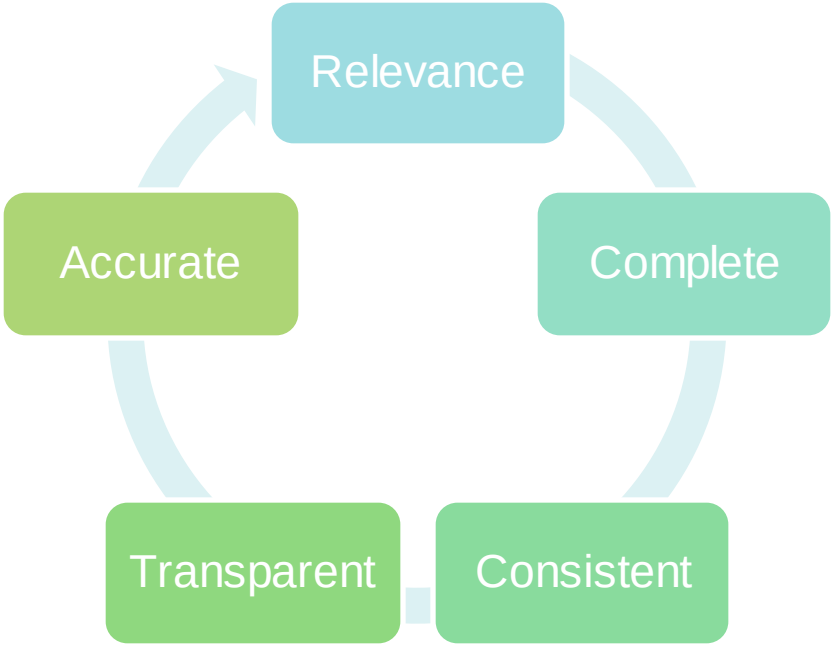
Currently, the Earth is already about 1.1°C warmer than it was in the late 1800s, and emissions continue to rise.

To keep global warming to no more than 1.5°C – as called for in the Paris Agreement, **emissions need to be reduced by 45% by 2030 and reach net zero by 2050**.

NET ZERO means all anthropogenic emission sources everywhere need to be reduced to zero.

Principles for developing an emissions inventory

- The GHG inventory for cities should follow the following principles:



“You can’t manage what you can’t measure.”

- Supports evidence-based decision-making
- Help cities to conceptualise GHG emissions now, and future pathways
- Basis for monitoring change in emissions and effectiveness of action
- Often required for financing mitigation actions

Why should we encourage cities to develop GHG inventories?

What is the GPC framework?

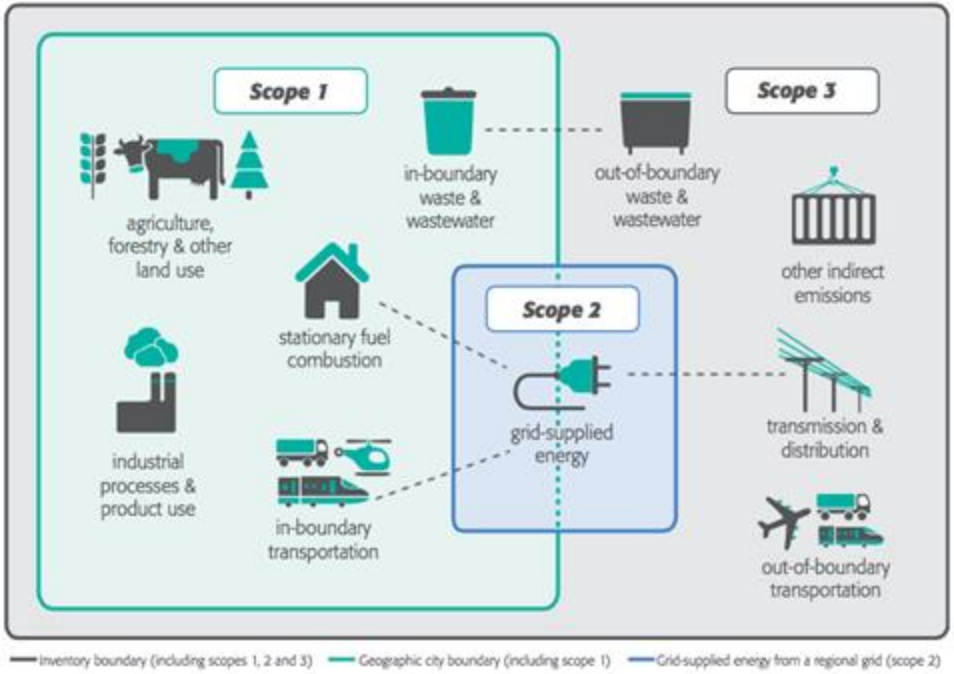
Source: WRI, C40, ICLEI. Global Protocol for Community-Scale Greenhouse Gas Inventories

- The Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC) is an internationally recognized accounting and reporting standard for cities.
- Offers cities a robust, transparent and consistent framework to identify, calculate and report on city-wide greenhouse gas (GHG) emissions.
- Developed by WRI, C40 Cities and ICLEI and tested by 35 cities. Published in 2014 and updated in 2021.

Available here in English and Spanish:
https://ghgprotocol.org/greenhouse-gas-protocol-accounting-reporting-standard-cities

Which are the sources and boundaries of city emissions?

- **Scope 1:** All GHG emissions from sources located within the boundary of the city (e.g. direct fuel use)
- **Scope 2:** All GHG emissions from the use of grid-supplied electricity, steam, heating and/or cooling within the city boundary
- **Scope 3:** All other GHG emissions that occur outside the city boundary as a result of activities within the city's boundary (e.g. landfill emissions when waste generated inside the city but disposed outside)



Exercise 1: Which of the following emission sources are included in a city's inventory?

Emission source	Included (Y/N)	Scope	Sector
1. Car travelling into the city from outside the boundary			
2. Methane generated by livestock in the city boundary			
3. Waste treated at a landfill outside the city boundary			
4. Electricity used to process crops in the city boundary			
5. Coal-fired power station generating electricity for the national grid in the city boundary			
6. Biogas used for cooking in schools in the city boundary			
7. Electricity used to treat water outside the city boundary, for use in the city			

Answers

Emission source	Included (Y/N)	Scope	Sector
1. Car travelling into the city from outside the boundary	Y	1	Transport
2. Methane generated by livestock in the city boundary	Y	1	AFOLU
3. Waste treated at a landfill outside the city boundary	Y	3	Waste
4. Electricity used to process crops in the city boundary	Y	2	Stationary energy
5. Coal-fired power station generating electricity for the national grid in the city boundary	N	-	-
6. Biogas used for cooking in schools in the city boundary	Y	1	Stationary energy
7. Electricity used to treat water outside the city boundary, for use in the city	?	3	Stationary energy

Data Collection

Includes statistical data such as:

- Population statistics
- Electricity sales
- Non electrical energy use statistics i.e. households using firewood, charcoal, LPG, kerosene lamps, etc.
- Fuel sales in the transport sector for petrol and diesel - official and also informal trade
- Waste data (volume and management methods)
  - Municipal waste
  - Organic and agriculture waste
  - Human waste
  - Recyclable waste
  - Industry and other use

Sectors and sources

Data collection must cover

- Stationary Energy including:
  - Electricity sales
  - Household fuels
- Transport i.e. vehicle fuel sales
- Waste data

Sources often include

- Invoices – i.e. utility bills for electricity bought/sold
- National and local census data – population data and household fuels
- Household surveys - fuel consumption, waste management, agriculture
- Industry and business surveys - fuel consumption, electricity use, waste management
- Department of Energy – fuel sales i.e. petrol, diesel, kerosene etc
- Municipal building, facility and fleet data
- Municipal/local landfill site and wastewater treatment plants data
- National and international reports/statistics
- Universities and research institutes papers

Calculating emissions

Emissions (kg CO_2e) = Activity data x Emission factor x Global warming potential (kg CO_2e/kg greenhouse gas)

- Activity data
  - Level of activity that results in emissions occurring (e.g. amount of fuel combusted, electricity consumed, tonnes of waste sent to landfill)
  - Area specific data

- Emission factors
  - Converts activity data to emissions of GHG
  - Published by many sources, including the Intergovernmental Panel on Climate Change (IPCC)

- Global warming potential
  - Converts emissions of other GHGs to consistent unit - kg or tonnes of CO_2 equivalent
  - Published by IPCC

Exercise 2: Calculate the emissions fron electricity usage in municipal buildings

- Estimate GHG emissions for the following scenario for one year in tCO_2e, and report which sector, sub-sector and scope these emissions fall under.

  - The municipality uses 560 000 MWh of electricity per year.
  - 82% of the electricity comes from the national grid.
  - 15% of the electricity is generated through diesel generators
  - 3% of the electricity is generated through rooftop solar PV
  - Use the emission factors provided and GWP values for AR2

Answer

GHG emissions (tCO2e)	Sector	Sub-sector	Scope
221 591 tCO2e	Stationary energy	Commercial and institutional buildings and facilities	1 and 2

Emissions (X CO_2e) = Activity data x Emission factor x Global warming potential (CO_2e/X greenhouse gas)

1. 560 000 x 85% = 459 200 MWh from the grid
   Emissions factor: 0,433606 tCO2e/MWh
   459 200 MWh x 0,433606 tCO2e/MWh = **199 112 tCO2e/MWh**

2. 560 000 x 15% = 84 000 MWh from diesel generation
   Conversion factor: 277, 7778 MWh/TJ
   84 000/277.7778 = 302,34 TJ diesel
   Emission factor: 74,349 tCO2e/TJ
   302,34 x 74.349 = **22 479 tCO2e**

3. Negligible emissions from solar PV

4. 199 112 + 22 479 = **221 591 tCO2e**

Challenges when compiling an emissions inventory and how to overcome them

Challenges

- Lack of robust data and access to data
- Lack of internal capacity and resources to compile an inventory
- Accounting for emissions from coal and fuelwood, especially at the household scale
- The value of doing an inventory is not always seen
- Conflicting/unclear mandates of different departments

Potential solutions

- Prioritize data that is readily available, and that will lead to concrete actions and projects, or focus on the high emitting sectors
- Use proxy or national data where possible
- Mobilise a cross-departmental task team to work on the inventory to leverage resources and align with various mandates

Proxy data

- Typically not all activity data for compilation of a BEI are available as:
  - Unique data required for each emissions category
  - Sourcing activity data generally most challenging part of developing a GHG Inventory

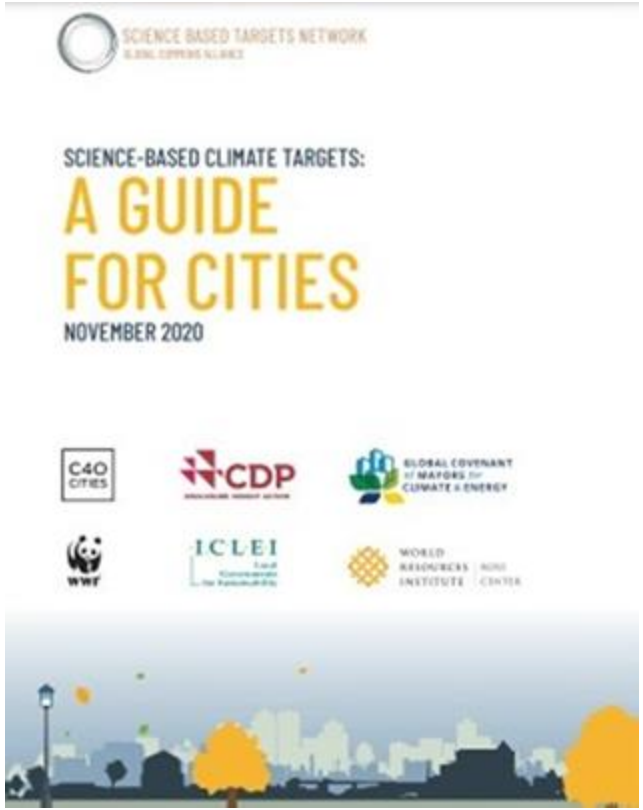
- Where data are lacking, national, regional and international data can be used. **Examples:**
  - National fuel and electricity consumption
  - Regional (multiple-country and/or continental) waste and wastewater generation rates per capita

- In many cases the data need to be downscaled to represent the sub-national region. **Downscaling can be achieved using various factors, including:**
  - Population
  - Economic (GDP)
  - Specific statistics (e.g. household sub-national cooking fuel statistics)

The importance of science-based targets

Science based targets (DP)

- **The Science says:** we must act urgently to reduce greenhouse gas emissions by 45% by 2030 and **achieve net zero by 2050**, in order to limit global warming to 1.5 °C above pre-industrial levels.
- Targets adopted by cities to reduce GHG emissions are considered to be science-based if they are in line with the goals of the **Paris Agreement**
- Science-based targets should be bound by the following principles: they must be science-driven, equitable, and complete.
- SBT Guide that offers different methodologies to cities based on data points
- Science-based climate targets for cities is one of the approved ways for cities to join the UNFCCC's Race to Zero campaign.



Science based targets

- Once cities understand their environmental impact and climate risks, they can build a robust climate action plan (CAP) with science-based targets (SBTs)

- Interim targets are included to ensure cities stay on track.
    - E.g. The SEACAP of Nakuru County seeks to reduce GHG emissions by 33% by 2030 compared to the business-as-usual scenario.

- Near-term or interim targets included in the Climate Action Plan outline how cities will reduce their emissions by implementing prioritised projects across relevant sectors such as energy and waste, in support of emissions reduction targets.

Reporting to the CDP-ICLEI Track

Reporting to the CDP-ICLEI Track

CDP-ICLEI Track helps local governments and their cities report their environmental activities, track progress, understand their impact and take action.

The CDP-ICLEI Track supports your city to measure, manage and disclose its climate and environmental impacts and actions over time. By responding to CDP's questionnaire, your city can:

- **Identify** climate change risks and opportunities
- **Report** greenhouse gas emissions and targets
- **Track** mitigation and adaptation actions across a variety of impact areas (e.g. energy, transport, food, water, waste)

https://www.cdp.net/en/cities

Why Report?

- The OPCC commitment is consistent with existing reporting metrics and does not require additional reporting burdens.
- Disclosing environmental data through CDP-ICLEI Track has a huge number of advantages, from improved engagement to centralising data and tracking progress.
- CDP evaluates responses, benchmarks performance against peers and finds areas of opportunity for your city.
- All publicly reported data is available on the Open Data Portal.
- CDP has provided 238 cities with science-based target setting support

Benefits of reporting to the CDP-ICLEI Track

- One global reporting system for multiple initiatives
- Receive a CDP score and feedback, that supports transparency & good governance > improving investor confidence
- Influence policy and decision-making
- Contribute to a 1.5° aligned, nature positive, equitable world
- Access to insights and knowledge-sharing with other cities
- The One-Stop-Shop: easy access to other environmental initiatives and services > fulfil your GCOM requirements
- Access finance
- Align with best practice

https://www.cdp.net/en/cities

City Experiences

Questions and Discussion

Thank you!

Get in touch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