

# ICOS | Cities

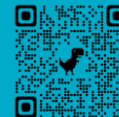


## @ KADI Stakeholder Meeting

Dr. Claudio D'Onofrio - Project Coordinator – Lund University – ICOS Carbon Portal

2024 / 10 / 15

<https://www.icos-cities.eu/>





ICOS | Integrated Carbon Observation System



Empa  
Materials Science and Technology



INRAE



TNO  
innovation for life



Technical University of Munich  
TUM

Organisation m eteorologique mondiale

European Social Survey

ECMWF



UAB  
Universitat Aut noma de Barcelona



A!

Aalto University

SciencesPo

LUNDS  
UNIVERSITET

FINNISH METEOROLOGICAL INSTITUTE

UNIVERSITY OF COPENHAGEN



Stadt Z rich  
Umwelt- und Gesundheitsschutz

KIT  
Karlsruher Institut f r Technologie



Universit t Basel

Consiglio Nazionale delle Ricerche

AIR PARIF



MAX-PLANCK-GESELLSCHAFT

AGH

Universiteit Antwerpen

gesis  
Leibniz-Institut f r Sozialwissenschaften



universidade de aveiro

origins earth

CzechGlobe  
 stav v zkumu glob ln  zm ny AV  R, v. v. i.

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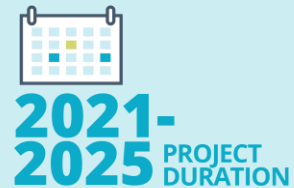
## “Cities are where the climate battle will largely be won or lost.”

António Guterres, Secretary-General, United Nations  
*Speech at C40 World Mayors Summit (Copenhagen), 11.10.2019*



# ICOS Cities

- **Pilot Application in Urban Landscapes** – towards integrated city observatories for greenhouse gases
- Urban green-house gas observation
  - ICOS Cities bring together and evaluate the most innovative measurement approaches of greenhouse gas emissions in densely populated urban areas.
  - The project supports the European Green Deal and aims at developing useful tools and services for cities in support of their local climate action plans.
  - The project aims at creating data services that have societal impact.





# ICOS Cities network

## 3 PILOT CITIES:

Paris, Munich and Zurich

## 12 NETWORK CITIES:

Antwerp, Barcelona, Basel, Brno, Athens, Copenhagen, Heidelberg, Helsinki, Krakow, Rome, Rotterdam and Porto



# KEY OBJECTIVES

1

## RELIABLE DATA

Develop and test comprehensive greenhouse gas measurement observatories and technologies in urban environments, to produce reliable data for cities

2

## PILOT STUDIES

Conduct pilot studies in large, medium and small cities, and later implement the same methods in multiple European cities

3

## SERVICES & TOOLS

Develop services and tools based on the needs of cities, for processing and analysing the observation data, while raising awareness and engaging citizens

4

## SUPPORTING THE EUROPEAN AMBITION

Provide the future backbone of an urban GHG monitoring system in Europe and contribute to the European ambitious climate strategy to meet the targets of the Paris Agreement.

5

## RESEARCH IN SUPPORT OF CITIES

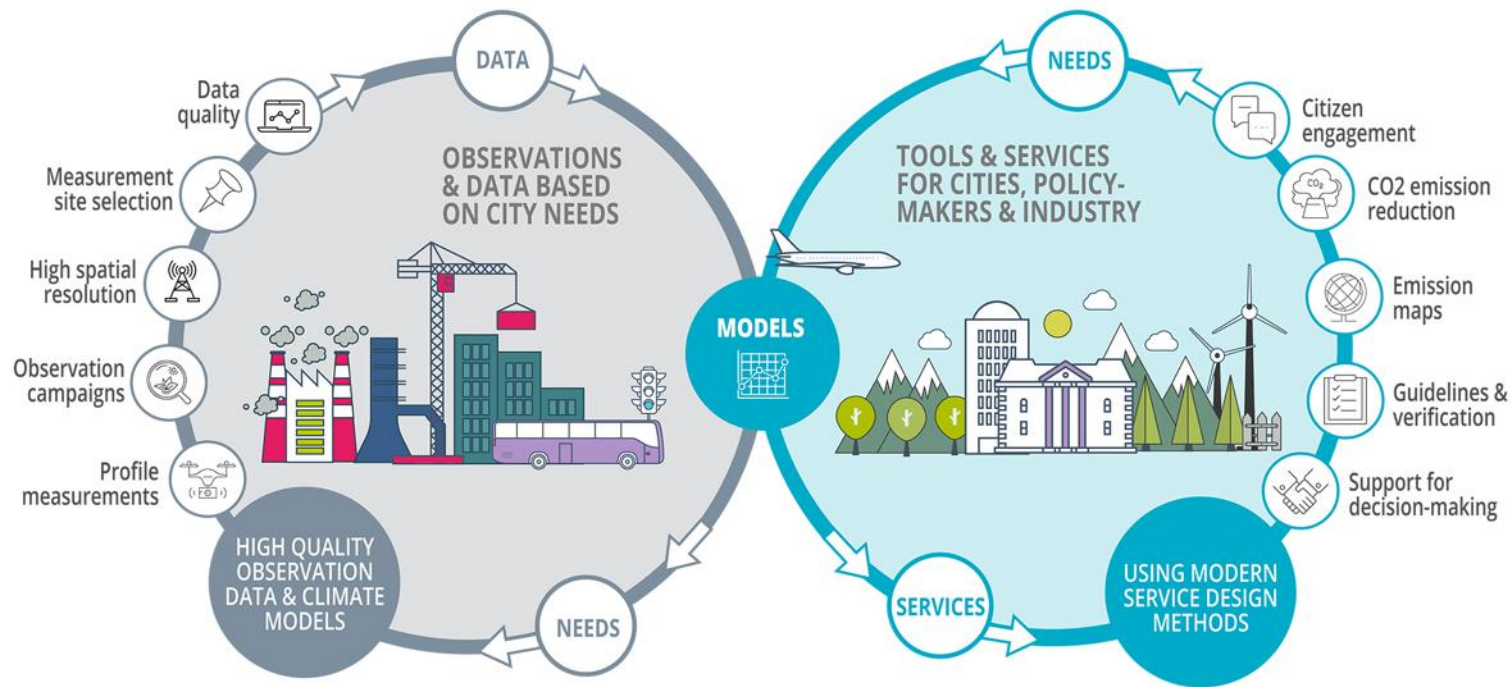
Design a concept for an upgraded Research Infrastructure able to support cities in implementing their climate action plans



# ICOS | Cities

ICOS Cities brings together European citizens, policy makers and top scientists to co-design pioneer greenhouse gas measurement methodologies and services for cities in support of climate action.

# From needs to data to services





# Ensuring the solutions fit the need

- Co-designing the services based on users' needs: user involvement e.g. through interviews of city officials and policy-makers, co-design workshops etc.
- Results of attitude surveys of the pilot city citizens feed into the solutions and concepts created
- Policy briefs and guidelines for cities and national policy-makers
- Creation of educational materials for schools: Teach the teacher
- Observation and verification of implemented actions to reduce emissions.

# Service levels we aim for

## Inventories

- Analysis
- Visualisation
- Communication
- Verification of climate action

## Predictions / Scenarios

- Analysis of future climate action
- Visualisation of scenarios
- Forecast of pathways
- Optimising city planning
- Including co-benefits (e.g. with air quality)

## Observatory for verification

- Verification (Inventories ++)
- Support of scenarios
- Optimising city planning
- Communication of success

# Stakeholders

A **stakeholder** is any individual, group, organization, or entity that has an interest in or is affected by the activities, decisions, or outcomes of a project, policy, or organization.

# Stakeholder Groups

- Government agencies
- Researchers and scientists
- Environmental organizations
- Utility companies
- Businesses and industries
- Residents
- Transportation agencies
- Real estate developers and construction firms
- ...

# Stakeholders interest

In our project, the common interest are Greenhouse Gases (GHG). This includes (but is not limited to):

- monitoring
- verification
- adaptation
- mitigation
- education
- environment
- economics
- social, and political factors



# who, why, what

- talk & discuss... now
- there is no one solution that fits all
- it is an iterative process
- greenhouse gases ... it is a long-term affair



► Climate Positive Olympic Games - Brisbane 2023

Previous ICOS Cities talk | September 2024  
Dr Tony Heynen, School of Chemical Engineering, University of Queensland, Australia



► Exploring innovation in climate governance

Previous ICOS Cities talk and panel discussion | March 2024

Talk 1: Kristine Kern (Leibniz Institute for Research on Society and Space)

Talk 2: Nürja Soisosa Caba (Aalto University)

Panel discussion: Kristine Kern, Miranda Schreurs, Rene Estermann



► Developing services for urban GHG monitoring systems

Previous ICOS Cities talk | July 2023  
Tatu Mattila, Aalto University



► Mapping future emissions based on city climate plans

Previous ICOS Cities talk | May 2023  
Ivonne Alabaus, Laboratory of Climate and Environmental Sciences (LSCÉ)



► Towards real-time monitoring of climate action plans

Previous ICOS Cities talk | March 2023  
Kimberly Mueller (NIST) & Amewu Antoinette Mensah (UGZ)



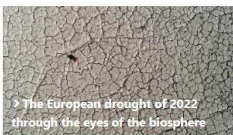
► Monitoring and verification of emissions in urban areas

Previous ICOS Cities talk | March 2023  
Prof. Tuukka Petäjä, Dr. Glen Peters & Dr. Claudio D'Onofrio



► Urban emission monitoring - general overview of current options

Previous ICOS Cities talk | January 2023  
Dr. Dominik Brunner (EMPA), Dr. Ingrida Šušter (TNO), Dr. Jeroen Kuenen (TNO)



► The European drought of 2022 through the eyes of the biosphere

Previous ICOS Cities talk | December 2022  
Auke van der Woude, PhD student, University of Groningen and Wageningen University



► Foundations of the ICOS Carbon Portal services

Previous ICOS Cities webinar | November 2022

Oleg Mirzoi, Ex-Physicist, Software Developer, Carbon Portal



► How the Ukraine crisis impacts energy and climate policies in the EU



► How to keep your data tidy, safe and reusable



► Urban air flow/meteorology and meteorological modelling in cities

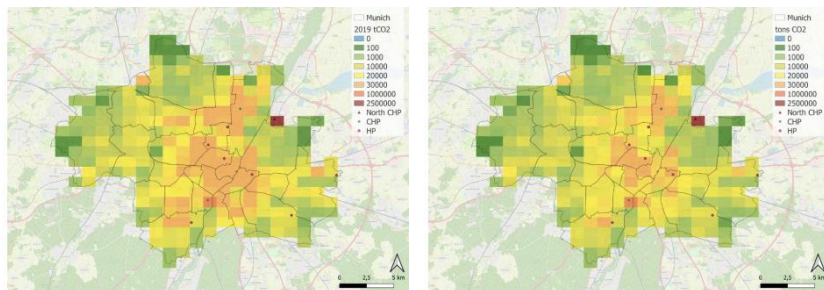


# ICOS Cities

<https://www.icos-cp.eu/projects/icos-cities/talks>

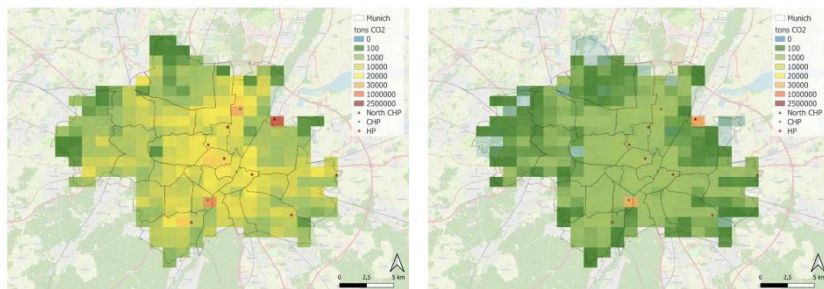


# Climate Plan Mapper



(a) Munich, 2019, TNO 1km<sup>2</sup>, tCO<sub>2</sub>

(b) Munich, 2030, TNO 1km<sup>2</sup>, tCO<sub>2</sub>



(c) Munich, 2050, TNO 1km<sup>2</sup>, tCO<sub>2</sub>

(d) Munich, 2035, TNO 1km<sup>2</sup>, tCO<sub>2</sub>

**Fig. 4** Spatial distribution of the total annual emissions over the city of Munich based on the TNO 1x1 km inventory according to the realization of the climate actions (Panel **a**, **b**, **c**). Panel **d** shows Munich in 2035 if the goal of 0.3 tons CO<sub>2</sub>e per capita is achieved. *CHP* Combined heating and power plant, *HP* Heating plant

From political pledges to quantitative mapping of climate mitigation plans: Comparison of two European cities

Albarus, I., Fleischmann, G., Aigner, P. *et al.*  
*Carbon Balance Manage* **18**, 18 (2023).

<https://doi.org/10.1186/s13021-023-00236-y>

# Education



**ICOS**  Cities

## WAS MACHT CO<sub>2</sub> MIT UNSEREM KLIMA?

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Lehrmittel „Was macht CO<sub>2</sub> mit unserem Klima?“, Version 1, Dezember 2023

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