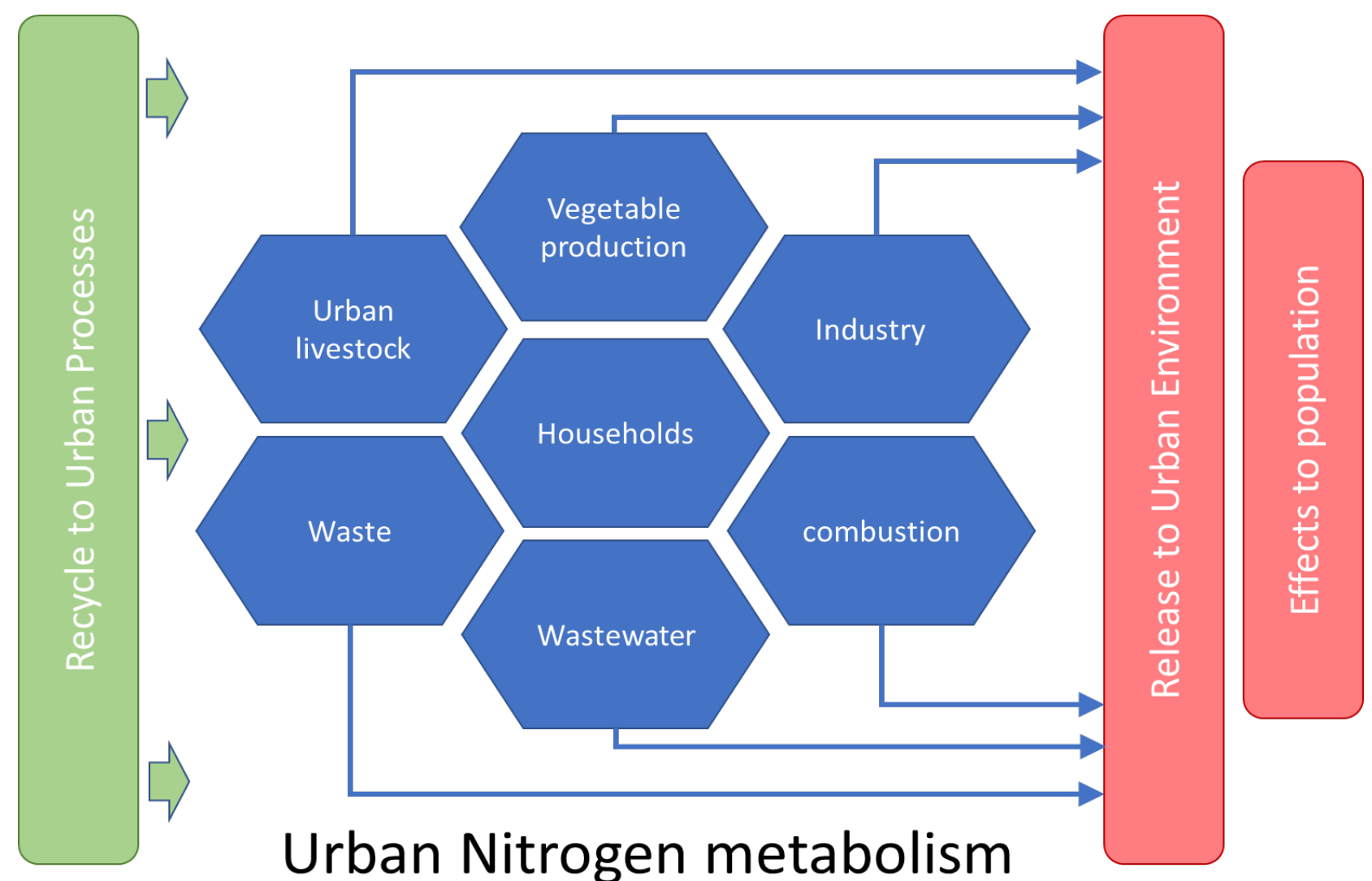


# UNCNET

Urban life is characterized by high population density, so small scale environmental issues easily affect a large number of people. Adverse impacts to human health and comfort, but also to the environment in general often are connected with nitrogen compounds released from a city's metabolism (peri-urban agriculture, combustion, industry) into air, water, and soil. This is nitrogen waste not only as output, but also waste of valuable materials and embedded energy. Urban agglomerations are specifically prone to high density of such waste streams, constituting notable hazards but simplifying concepts of recuperation. UNCNET will systematically develop "urban nitrogen budgets" to understand the reasons, pathways and possible intervention points of the release of such compounds, towards their reclamation and reuse and for closing of nitrogen cycles.



## Aim/objective

UNCNET aims to (i) break down the known issues of reactive nitrogen in the environment to the urban scale, (ii) assess quantities and magnitudes of stocks and flows of reactive nitrogen based on established methodology, (iii) develop modelling approaches and (iv) evaluate potential measures to close open cycles and improve the health and comfort situation of urban inhabitants.

## Approaches/methods

Urban nitrogen budgets will be established based on the principles of material flow analysis. Models based on such principles such as conservation of matter, energy and momentum will be implemented to investigate nitrogen compounds in different media (air, water, soil). Scenario techniques will allow to quantify effects of measures for future situation, and stakeholder consultation prepare for their implementation.

## Expected results and impacts

Developing an understanding how urban nitrogen cycles can be closed under very different situations – medium-sized and historic European cities vs. Chinese megacities – will allow for urban planning activities, in accordance with authorities, far beyond mere scientific interest. Interventions in urban agriculture and industrial effluents will provide market opportunities for green economy. Ultimately, urban inhabitants will benefit from cleaner air and water, lower greenhouse gas emissions and better preparedness for climate change.

### UNCNET - Urban Nitrogen Cycles: New Economy Thinking to master the challenges of climate change

**Duration:** Starting in 2019, ending in 2022 at the latest

**Internet:** [uncnet.org](http://uncnet.org)

**Contact:** Dr. Wilfried Winiwarter

**E-mail:** [winiwart@iiasa.ac.at](mailto:winiwart@iiasa.ac.at)

**Budget:** €803,570

**Partners:** International Institute for Applied Systems Analysis (IIASA), University of Zielona Góra – Institute of Environmental Engineering, brainbrows informationsmanagement gmbh, E.C.O. Institut für Ökologie Jungmeier GmbH, Chinese Academy of Sciences (CAS) – Center for Agricultural Resources Research, Peking University (PKU) – Dept. of Atmospheric and Oceanic Sciences.

### Involved countries

- Austria
- China
- Poland

## The Sustainable and Liveable Cities and Urban Areas call

The pilot call Sustainable and Liveable Cities and Urban Areas organized by JPI Urban Europe and the National Natural Science Foundation of China (NSFC), inviting interdisciplinary Sino-European consortia opened on January 31st, 2018.

[jpi-urbaneurope.eu](http://jpi-urbaneurope.eu)  
#JPIUrbanEurope

