Why we do research on sustainable, climate neutral and smart cities

Cities are the place where the biggest part of resources is spend and where long-lasting infrastructures conglomerate.

New technological solutions, lifestyle and local identity merge with new business models.

Cities become real laboratories for the research on the transition to a sustainable development. Different strategies join together and can be investigated: climate and resource protection, adaption to climate change, the reorganisation of energy systems, new models of production and consumption.

A tight cooperation with local actors is an inherent part of the research activities.
Selected studies on sustainable cities by the Wuppertal Institute

- Low Carbon Future Cities - A Sino-German Cooperation on an Integrated Climate and Resource Proof Urban Development
- Munich - Roads to a Fossil Carbon Free Future
- Sustainable Emscher - Towards Sustainable Infrastructures
- Accompanying Scientific Research InnovationCity Ruhr

The research approach

Understanding the System

Enabling Transitions

Transitions to what? Defining Targets

System-Knowledge
(Understanding socio-technical systems in their natural environment)

Transformation-Knowledge
(Enabling complex societal transitions)

Target-Knowledge
(Defining socio-ecological targets for a sustainable world: identification of trade off's and synergies)
The “Initiativkreis Ruhr” initiated a competition to identify a city which could function as a model city to elaborate strategies for climate neutral urban development.

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### InnovationCity Ruhr – Model City Bottrop

#### Phase 1
- Bochum
- Bottrop
- Gelsenkirchen
- Herne
- Herne-Recklinghausen
- Mülheim an der Ruhr
- Oberhausen
- Schwerte
- Witten

#### Phase 2
- Bochum
- Bottrop
- Essen
- Gelsenkirchen
- Herten
- Mülheim an der Ruhr

**The Winner**

- Target: 50% CO₂ reduction until 2020

### The pilot district

- 70,000 Inhabitants
- 14,500 Buildings
  - 12,500 Residential
  - 2,000 Commercial
Institutional Background

Wirtschaft

Accenture
agranetz
ARCADIS
A.T. Kearney
Baustoff Pawella
Bayer MaterialScience
Beimern
Bosch
BP
Brabus
Bröte
Buderus
con energy
Deutsche Arminning
Deutsche Rockwool
ELE
E.ON
E.ON Ruhrgas
Emschergenossenschaft/
Lippeverband
EnergieAgentur NRW
Environ
Frank GmbH
GEB
Gelsenwasser
Hilwek
Hochtef

Industrial Board
62 Members

Scientific Board
26 Members

Inter-Ministerial
Working Group

Forschungs ministe-
rin für Bau-,
Wohnen, Stadtentwicklung
und Verkehr (MBWSV)
Ministerium für Wirtschaft,
Energie, Industrie,
Mittelstand und Handwerk
(MWEIMH)
Ministerium für Klimaschutz,
Umwelt, Landwirtschaft,
Natur- und
Verbraucherschutz
(MKULNV)

Innovation
Compendium
ca. 4 Months

Masterplan Process

Albert Speer & Partner

Innovation
Phase
ca. 5 Months
July – Dec. 2013

Target
InnovationCity Ruhr Manual
Blueprint for Urban Retrofitting

Target
Innovation
Compendium
ca. 4 Months

Elaboration
Phase
ca. 3 Months
Oct. – December 2012

Innovation
Compendium
ca. 4 Months

Albert Speer & Partner
Energy Turnaround – Bottom up

Extract List of Projects

- PLUS-ENERGY-Model Houses:
  - Detached House
  - Apartment Building
  - Commercial Building
  - Social Housing
  - Social Housing Plus Energy Building
  - Manual Consultation Process Rheinlabil
  - Living Lab
  - District Management

- Retrofitting of Companies:
  - Hochschule Ruhr West
  - Low Energy Gas-Station
  - Welding with Solar Power
  - Arche Noah Community Center
  - Industrial Estates Kropfengrün Klopwält

- Regenerative Energy:
  - CHP Pilot Project
  - Dual Demand Side Management
  - Pumped Storage Hydro Power Station
  - Warmth on Wheels
  - CHP Model Municipality
  - Smart Grid
  - Biggest Natural Gas Heat Pump

- Electric Mobility:
  - E-Mobility in the context of energetic district retrofitting
  - Electric Public Transport
  - E-Trucks
  - E-Vehicles
  - Car-Sharing
  - Quick Charging Station at Main Station

- Urban Development:
  - Masterplan Innovation City Ruhr
  - Integrated Urban Development Welheimer Mark
  - Photovoltaics Noise Barrier at A 42 Highway
  - LED-street Lighting
  - Rain Water Management at BEST Area
  - Cultivation of Facade Surfaces
  - Boardwalks and Bicycle Routes

Wuppertal Institute
InnovationCity Ruhr – Accompanying research

InnovationCity Ruhr and Masterplan-Process

Systematic long-term accompanying research evaluates proposes

Research Agenda

Thank you for your attention!

contact information:

Dr. Johannes Venjakob
Wuppertal Institute for Climate, Environment and Energy

Phone: 0049/202/2492102
eMail: Johannes.Venjakob@wupperinst.org
Homepage: www.wupperinst.org

InnovationCity Ruhr:
www.icruhr.de