

*Annual Conference of the Low Carbon Society Research Network*

*07. September 2016 | Wuppertal*

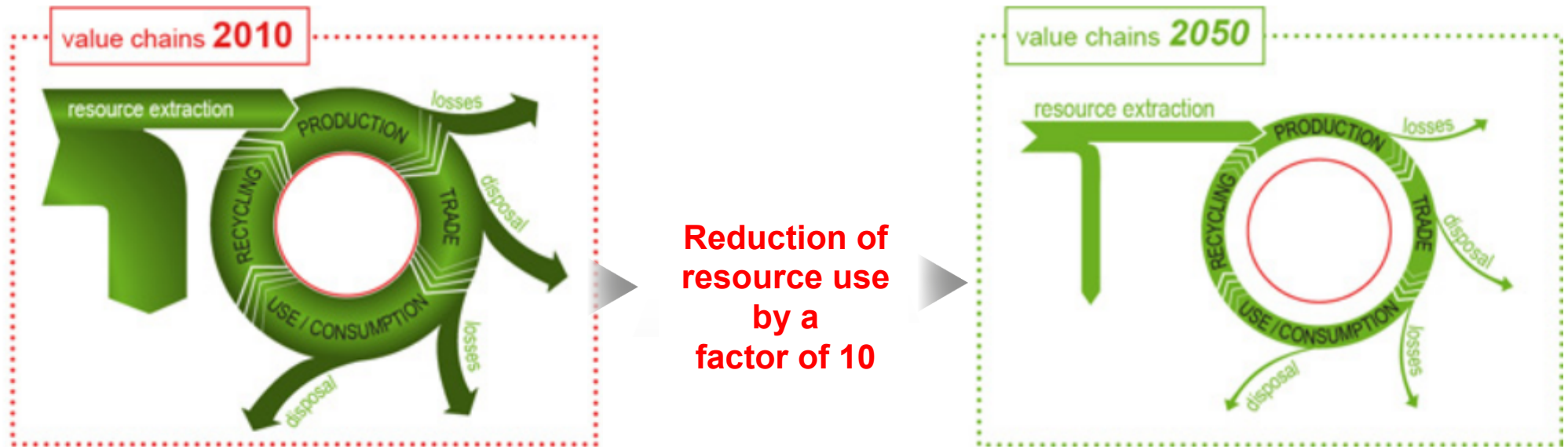
# Transition towards sustainable production and consumption: Contributions of LivingLab research

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Dr. Carolin Baedeker

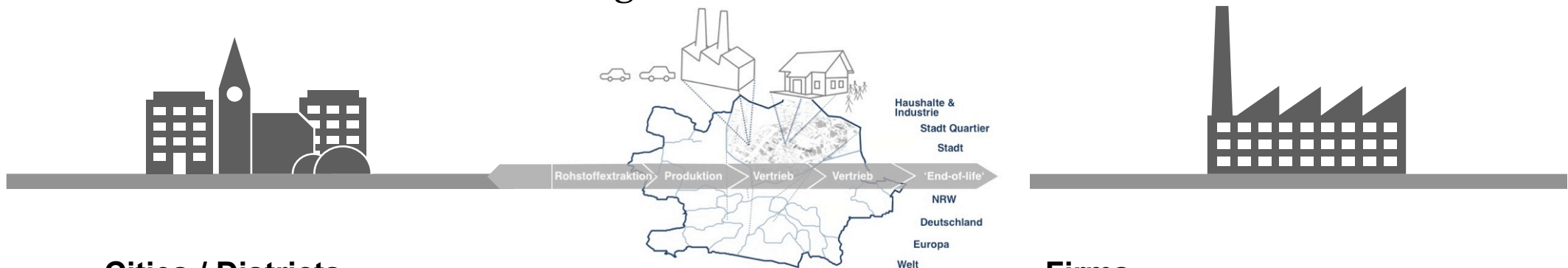
Wuppertal Institute for Climate, Environment and Energy

# Sustainable Production and Consumption Challenges for a low carbon and low resource society



### CO<sub>2</sub> - neutral and resource efficient city districts

- **High quality of living at 8t of resource use per person/a** through **design of sustainable product-service-innovations**
- User- and stakeholder integration in districts



#### Cities / Districts

Our vision is of cities and towns that are inclusive, prosperous, creative and sustainable, and that provide a good quality of life for all citizens and enable their participation in all aspects of urban life.“

Taken from: Aalborg Commitments 2004



#### Sustainable Living Lab

#### Firms

Sustainable firms provide products and services that integratively (relatively and absolutely) increase quality of life, participation and protect the environment.

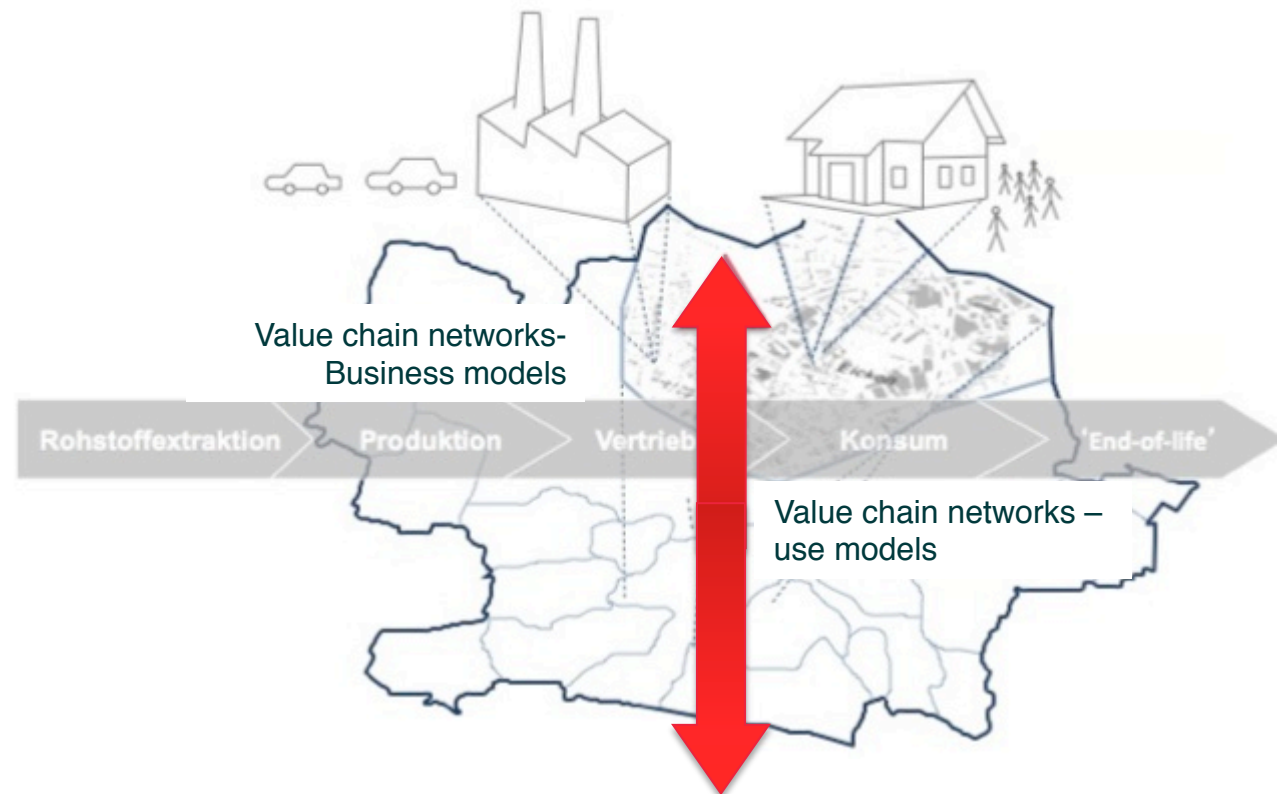
# Living Labs

## Infrastructure for innovations on different levels

### LivingLabs

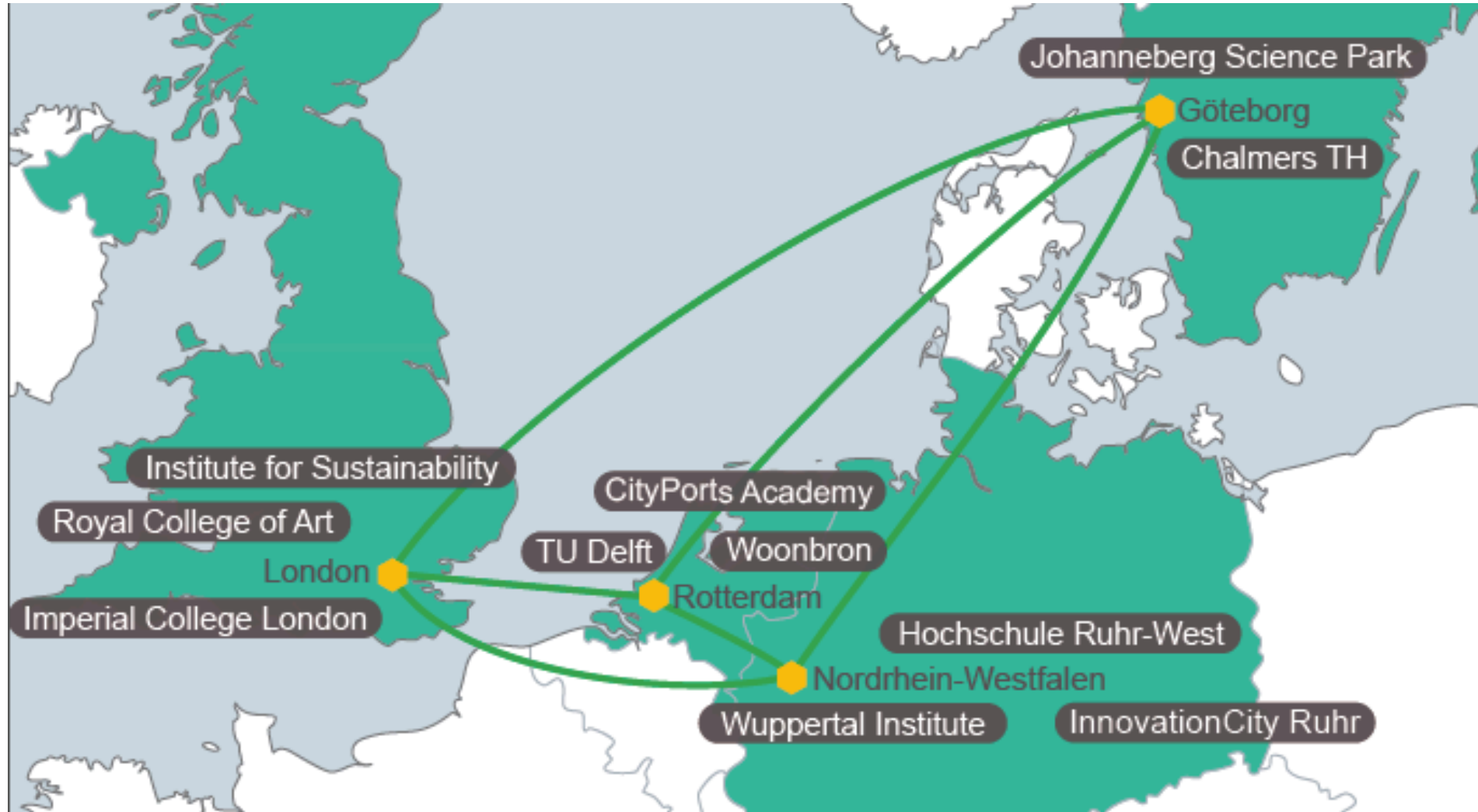
- Develop and implement socio-technical solutions in real settings of production and consumption systems (value chain networks)
- Involve key stakeholders from production, consumption, science, government in order to increase acceptance and change mindsets and value sets.

They work in real life settings and infrastructures (city districts / cities – laboratories – field structures)



Source: Schneidewind u.a. 2014 - Reallabore, adapted according to the LivingLab Methodology

# SusLab North West Europe (NWE)(2012-2015) Project partners and pilot region in Germany

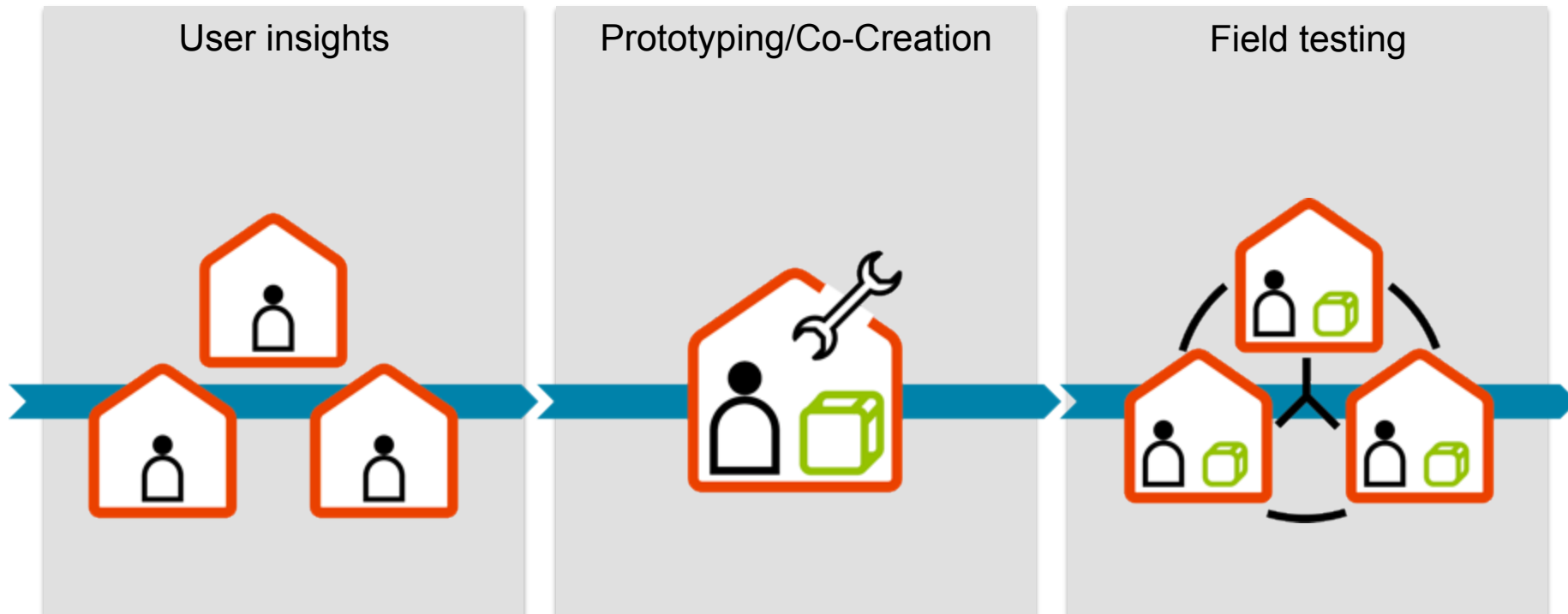


# SusLab North Rhine-Westphalia (SuslabNRW)

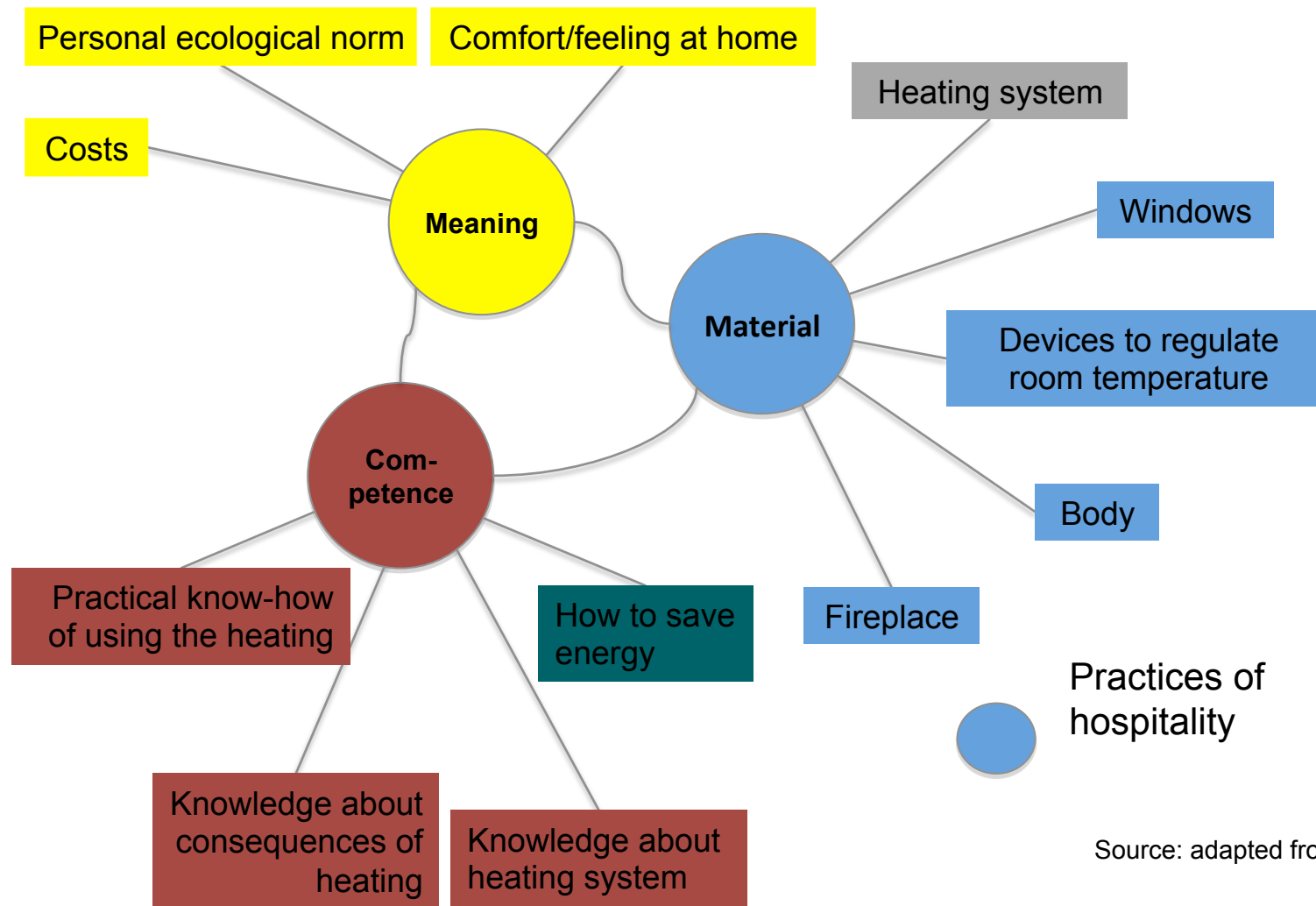
## Project partners



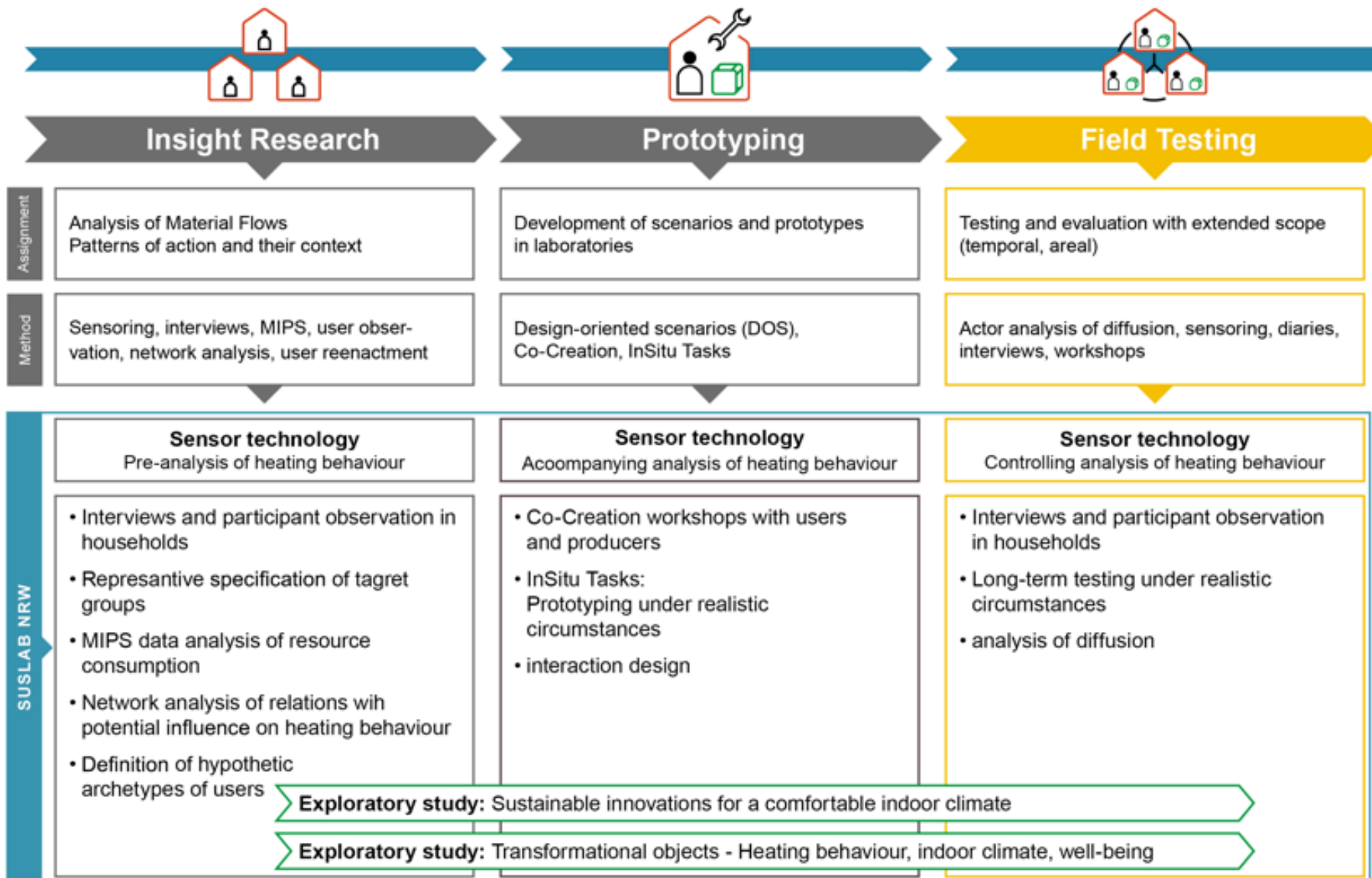
# LivingLab projects Methodology – a three tier model

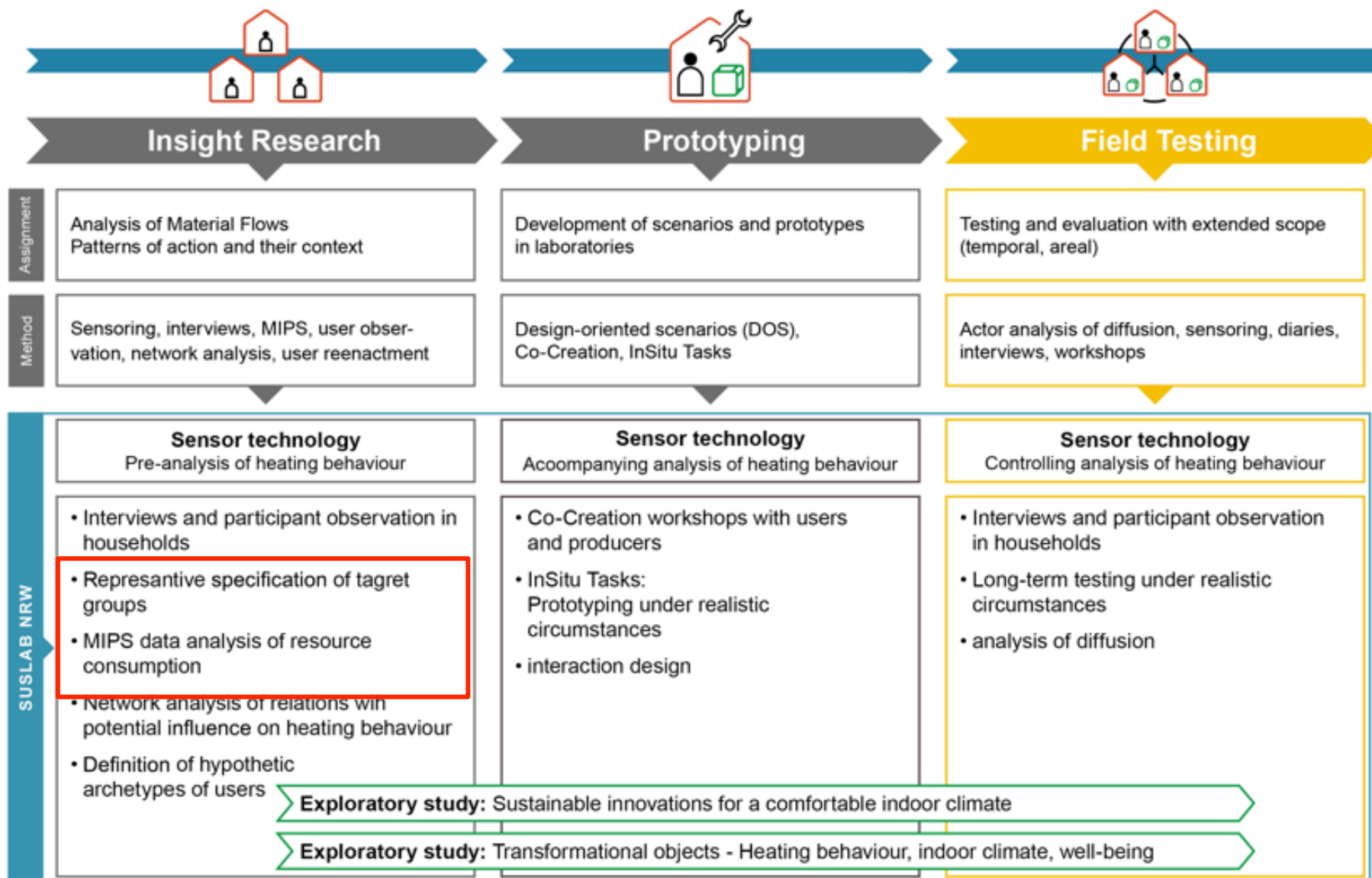






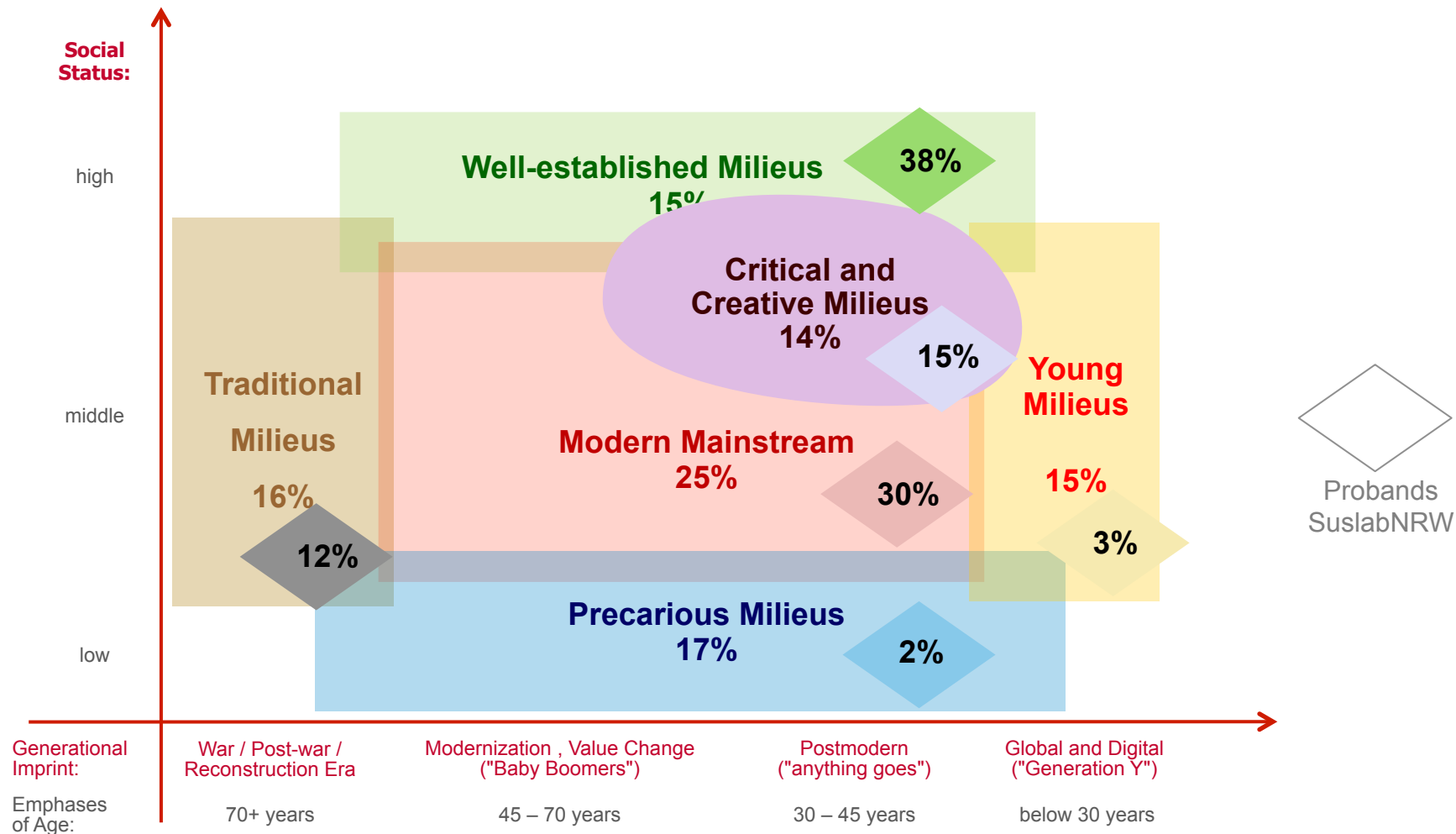






# User observation 2014/15

## Household typologies: Basic model with sample share as draft evaluation



Source: UBA / sociodimensions; representative survey "Environmental Consciousness and Behavior in Germany 2014", Sample: n=2.036 respondents 18+

# User observation 2014/15

## Material and Carbon Household Footprint in Bottrop

### Aim:

- Household observation concerning all fields of activity
- Calculation of life-cycle wide resource consumption Material Footprint and Carbon Footprint
- Comparison of resource consumption with the field of heating



housing



mobility



nutrition



recreation



waste &  
packages



tourism

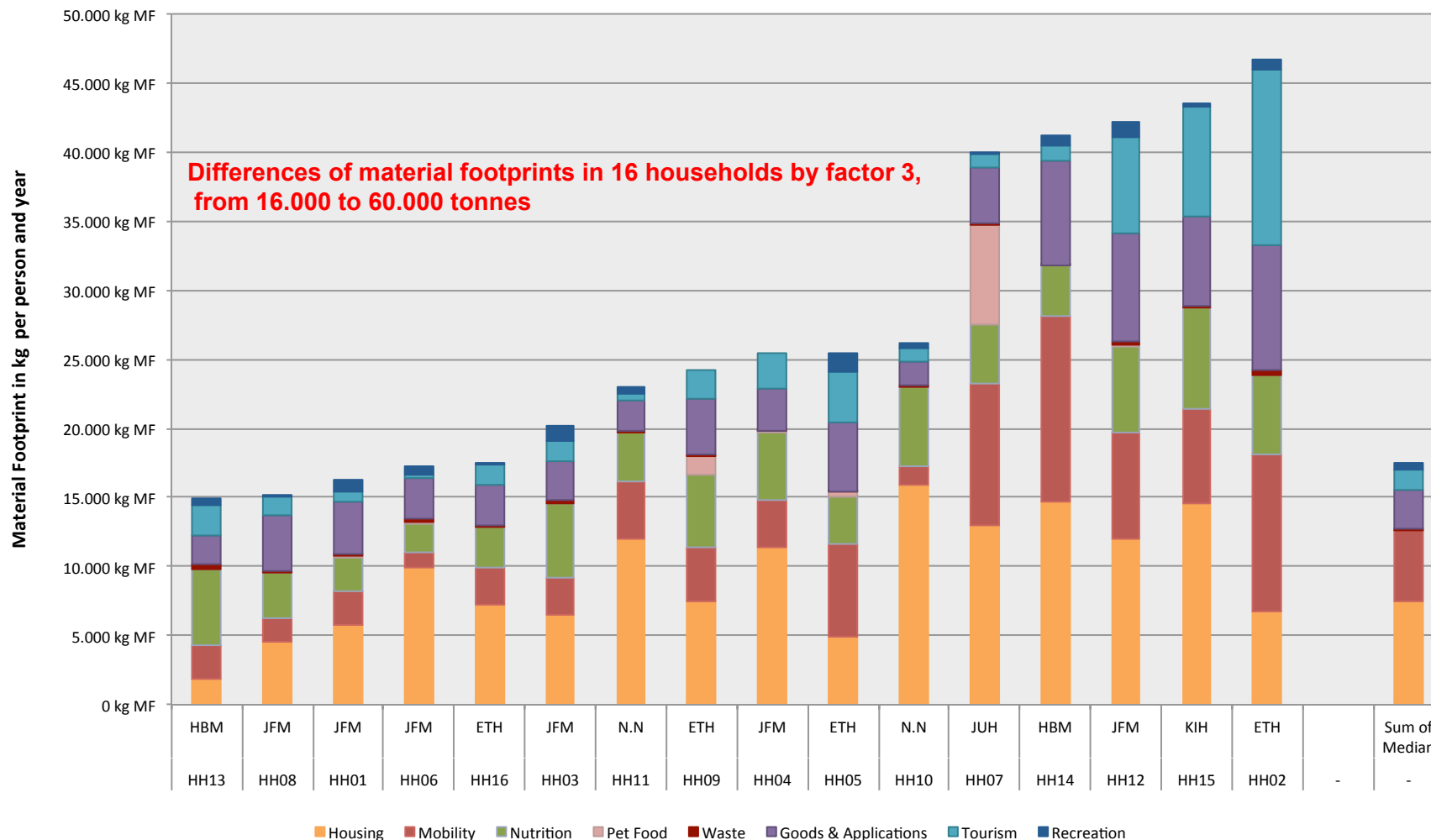


# User observation 2014/15

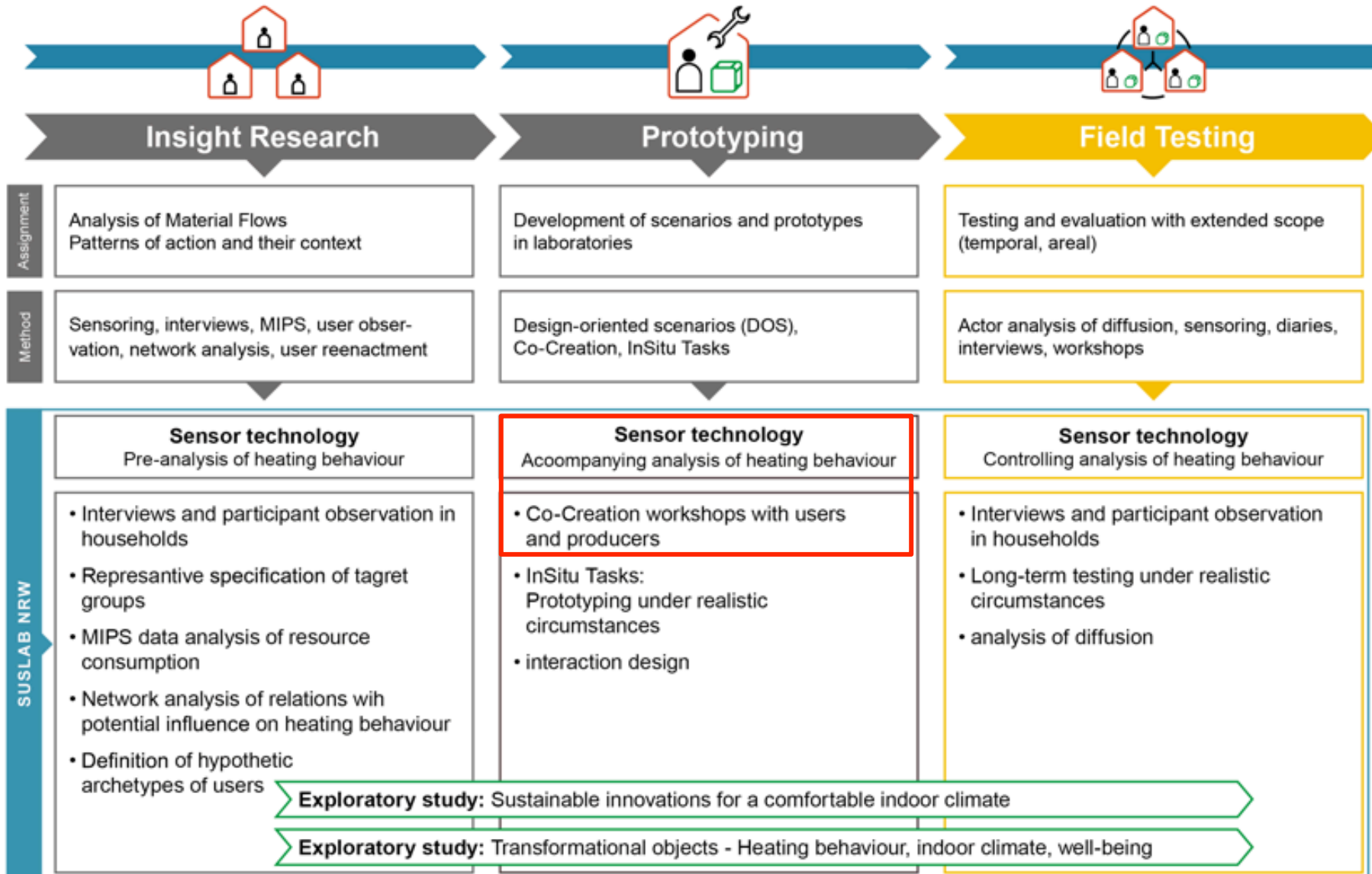
## Material and Carbon Household Footprint in Bottrop



Housing esp. heating high impact on resource consumption | Main influence: living space and number of persons



# Research design Prototyping



# Prototyping: Analysis of the heating-behaviour in 80 households in Bottrop

Accounting for the status-quo in several buildings:

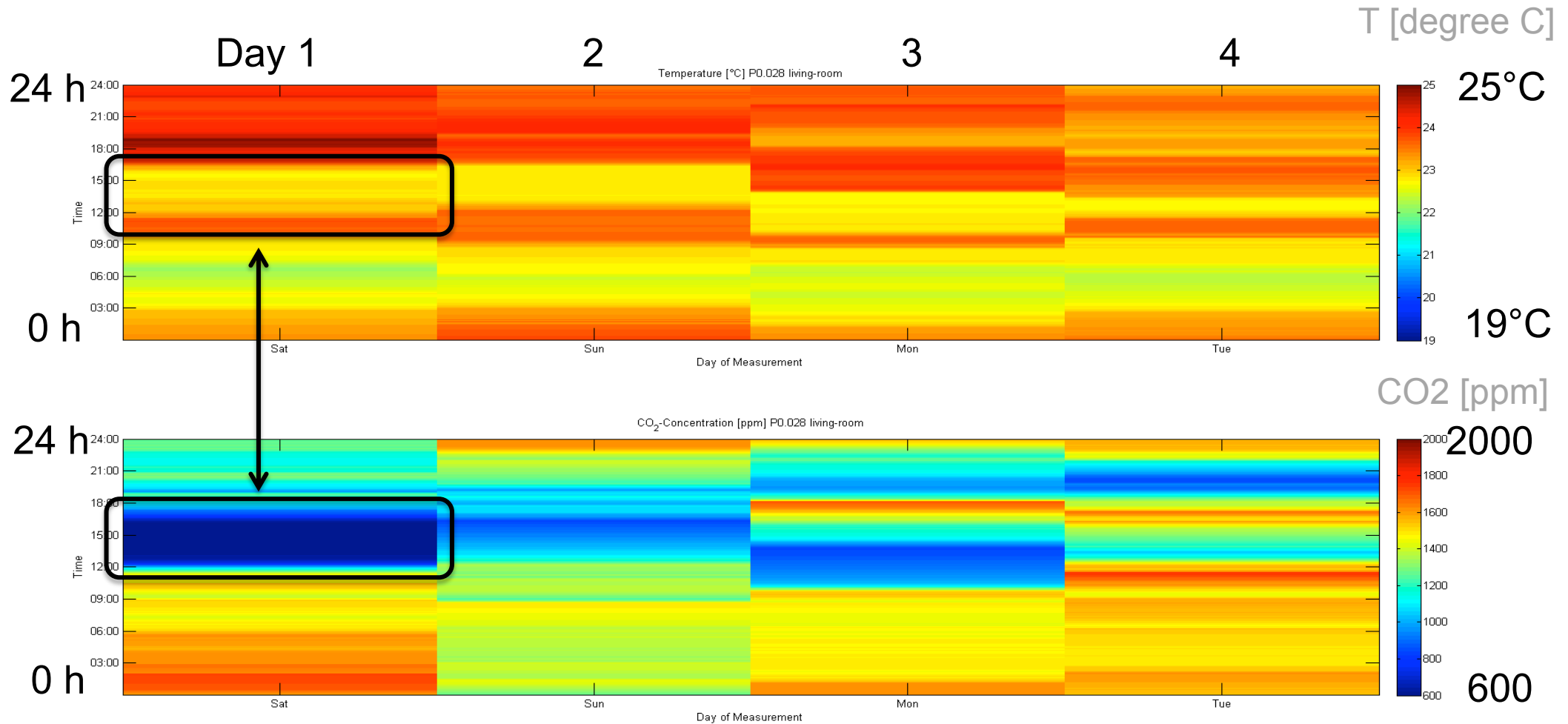
- data on indoor climate are collected with special **data loggers**
- for a period of 2 weeks
- **air pressure** and **-temperature**, **humidity** and **CO<sub>2</sub>-concentration**
- the specific **demand for warmth** is logged at the same time
- if realizable, **opening of windows** and presence in rooms are logged at the same time





# Prototyping 2012/13 – heating and airing

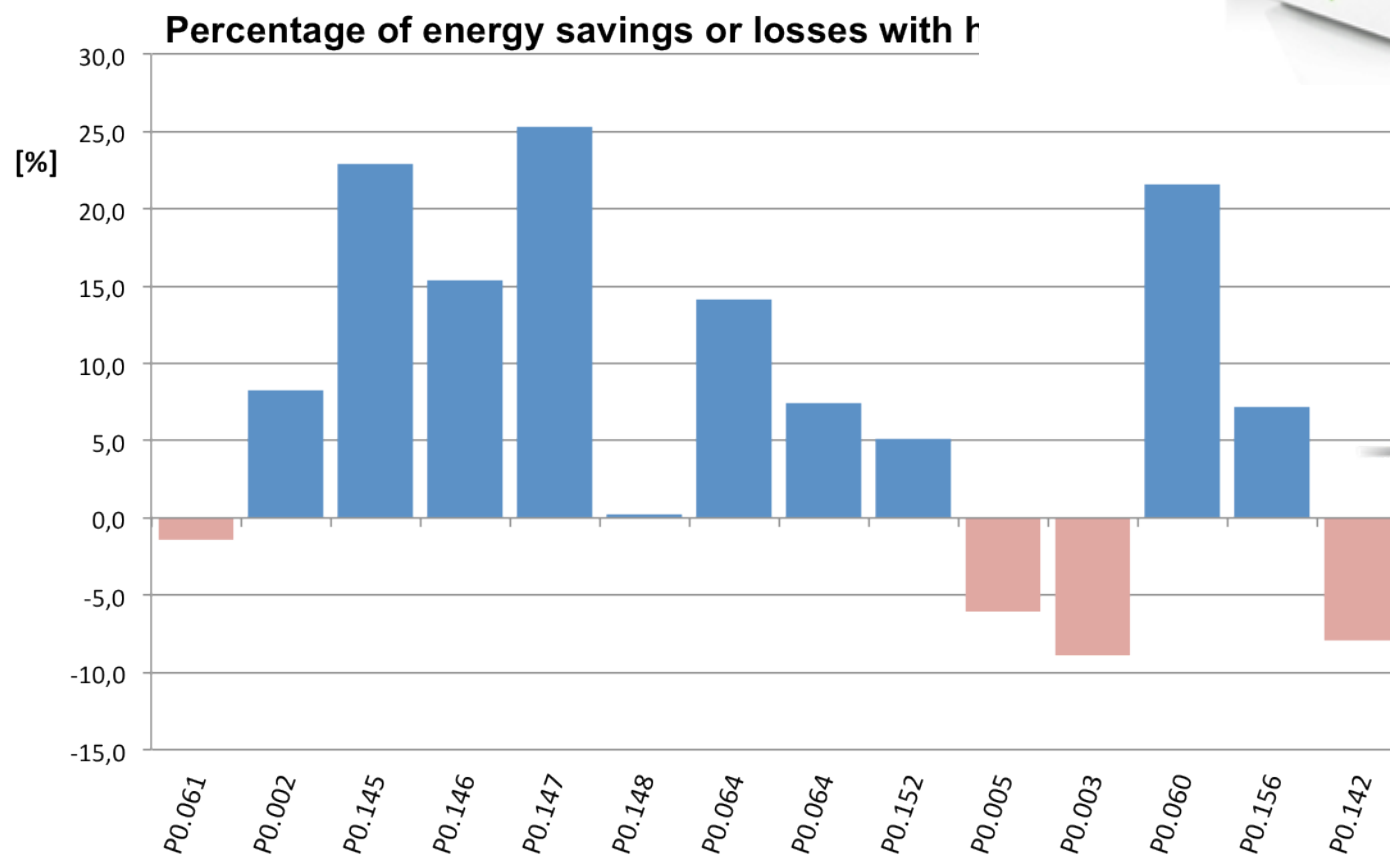
## Test person with above-average consumption



source: HRW und Wuppertal Institut /FG4 2013

# Household behaviour (testing 2014/15, two weeks)

## Possible impact of smart home systems

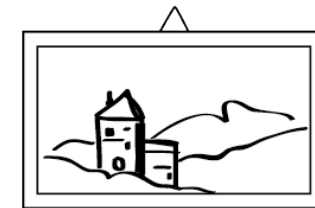
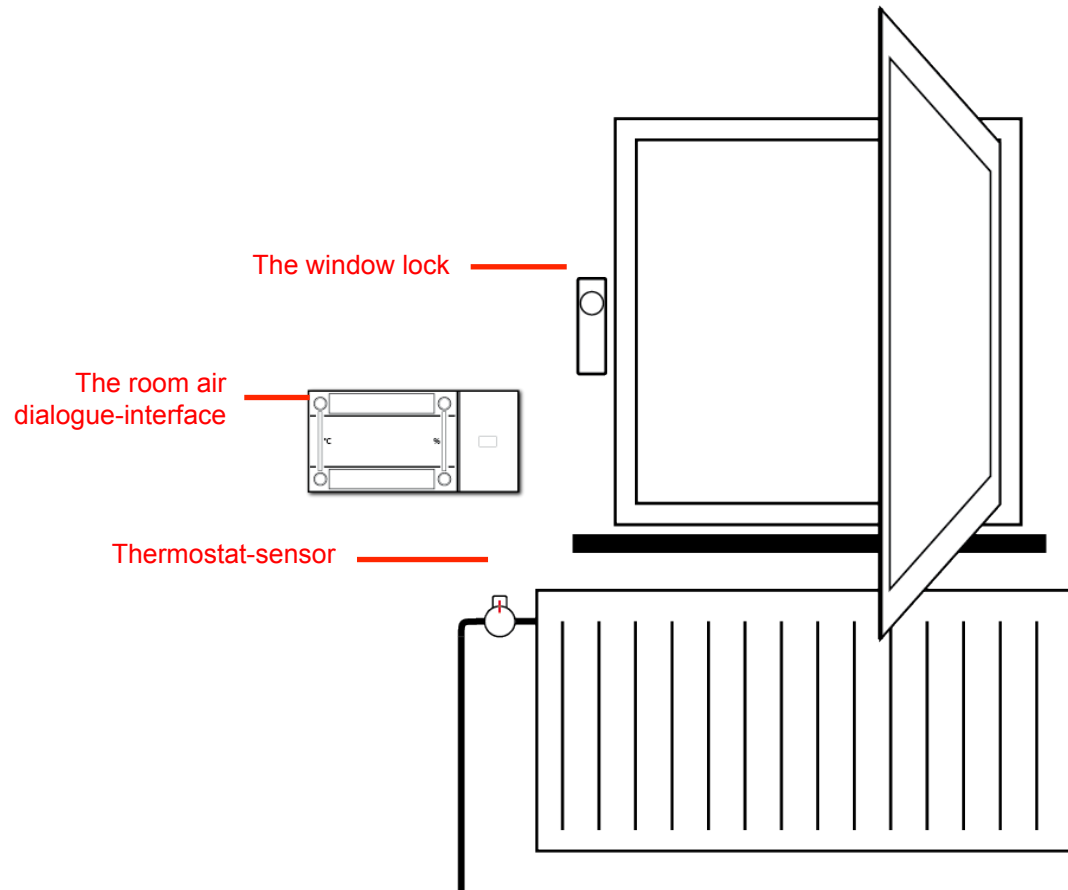


**CO2-Ampel Elk GmbH  
LUQA CO2 IAQ Monitor**

Source: HRW/WI 2014

# Transformational objects: The room air dialogue (setup)

## The individual elements of the prototype

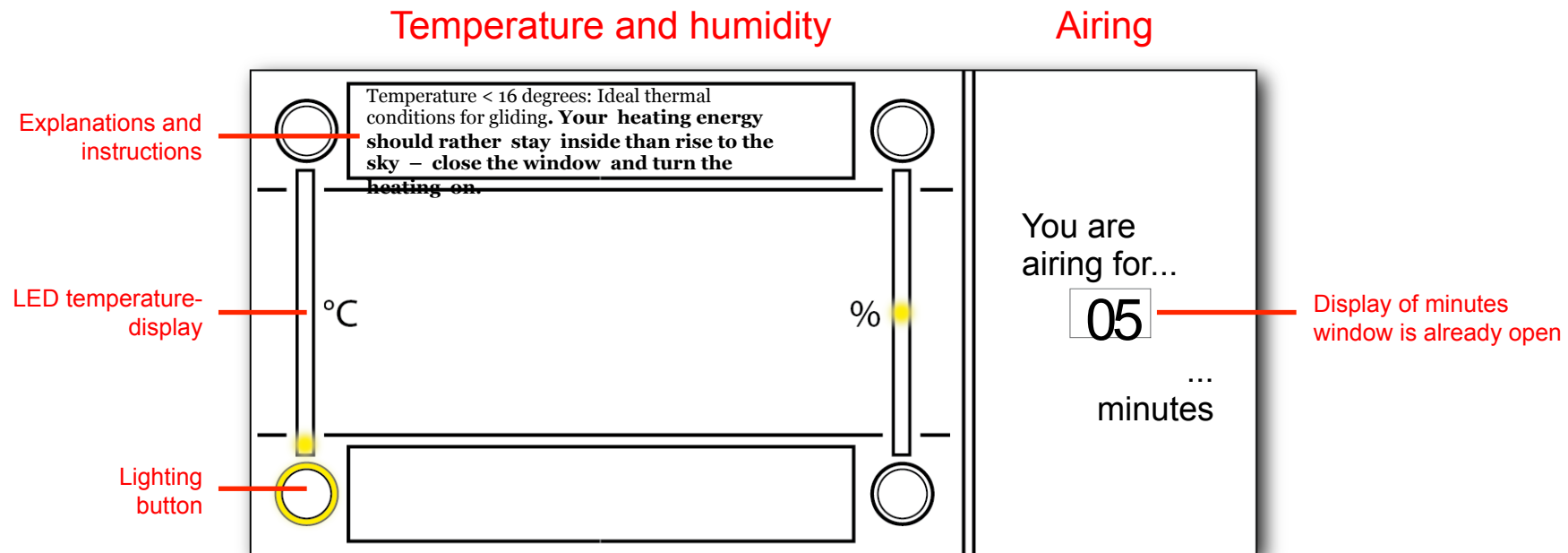


BMBF Project EnerTransRuhr  
Prof. Marc Hassenzahl, Dr. Matthias Laschke, Kai Eckoldt

# Transformational objects: The room air dialogue (setup)



The individual areas and elements of the room air dialogue interface



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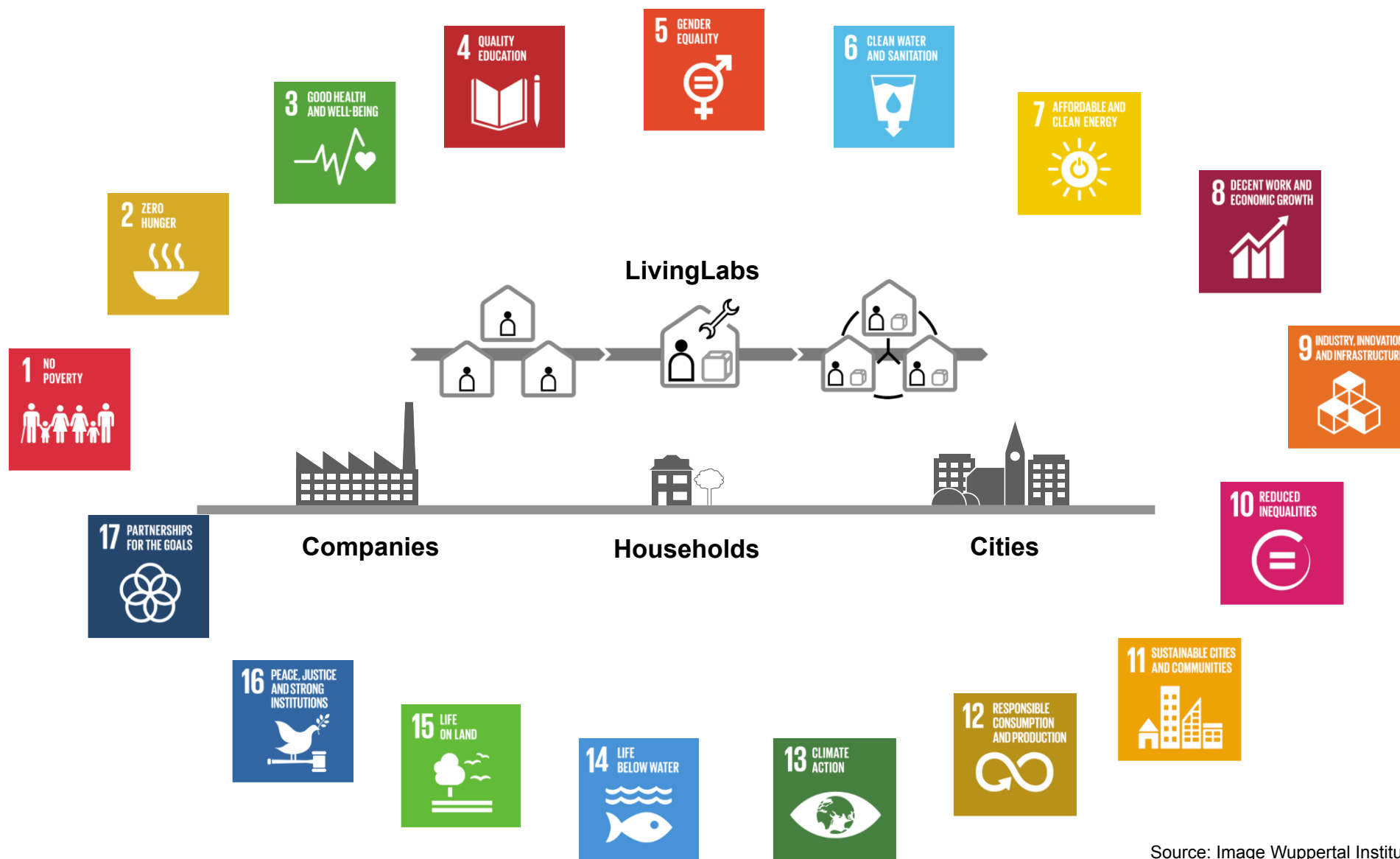
*Carolin Baedeker | carolin.baedeker@wupperinst.org*

**Thank you!**  
**Any questions?**

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For more information please visit our website  
[www.wupperinst.org](http://www.wupperinst.org)

# The “big picture” From the SDGs to an consumer perspective



Source: Image Wuppertal Institut 2016,  
based on the UN Sustainable Development Goals 2015

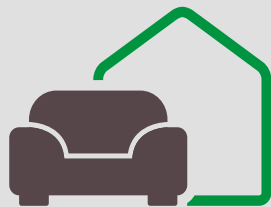
# LivingLab three tier model

## Socio-technical innovations: Example of SusLab in the city of Bottrop (Germany)



### User Insight Research

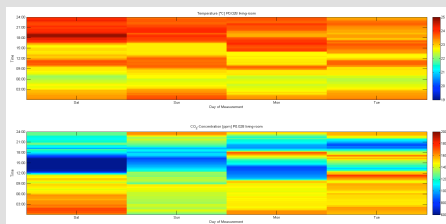
80 households/ 700 reference values



Analysis of heating behaviours



Variance in heating energy consumption



Heat map

### Prototyping/Co-Creation

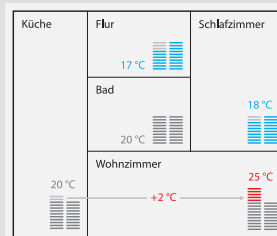
Companies



70-80 households



Transformational product



### Field Testing

> 50 - 500 households



International transfer GER / EU



Pilot region Innovation City

