Air quality and Smart Cities
Projects of RheinEnergie AG
Alexander Stankiewicz
Content

• EU-Project GrowSmarter – WP2 – Energy
  – GrowSmarter Call
  – Project area
  – What are our goals
  – Energy refurbishment
  – Energy
• SmartCity Cologne
  – Climate Street
  – Ship-to-Grid
EU-Project GrowSmarter
GrowSmarter Call – Smart Cities and Communities

• Holistic integration of
  – Energy,
  – Mobility and
  – ICT

in huge lighthouse projects (Barcelona, Cologne and Stockholm), being the first of it’s kind (first mover risk)

• It is an implementation project

• The „Follower Cities“ will replicate different measures and profit from the experience of the lighthouse cities
EU project GrowSmarter
Project area – WP 2 - Energy - Stegerwaldsiedlung
EU project GrowSmarter
WP 2 - Energy- What are our goals

• An attractive, clean and CO₂ reduced area

• Energetic refurbishment (heat and electricity) of inhabited buildings

• Creating a „nearly zero Emission“ traffic zone with several charging station for electrical cars

• Produce energy where it is used – introduce an intelligent energy management system „Siedlungsmanagement“ to maximize the usage of the electricity produced by the solar panels on the roof – also connected to the VPP of RheinEnergie
EU project GrowSmarter
WP 2 - Energy - Energetic refurbishment

• Increasing the energy efficiency by 60% (and more) in the buildings (Years of construction 1960 – 1962 and 33.529 m² of living space) by:
  – Insulation (facade, roof and basement)
  – Installation of 36 air-water-heatpumps (576 kW)
  – Installation of district heating system for peak load (1743 kW)

• Reduction of the specific energy demand from 130 – 180 to 30 – 40 kWh/m²/y

• Heat contracting (operation by RheinEnergie)

• Planned CO₂ reduction 60-70 %
EU project GrowSmarter

WP 2 - Energy

• Solar panels on all roofs (ca. 5.600 m², 875 kWp)

• Installation of 16 battery storages (approximate capacity 655 kWh, power 210 kW)

• Developing and implementation of the Siedlungsmanagement, a smart holistic energy management system for urban districts

• Common interface with the VPP of RheinEnergie (e.g. to offer balance power)

• Involvement of tenants by offering local solar power within a new tariff and providing Smart Home Systems to reduce the energy consumption by 5-8%

• Installation of charging infrastructure for electrical cars
EU project GrowSmarter

WP 2 - Energy
EU project GrowSmarter
WP 2 - Energy - Siedlungsmanagement

- Virtual power plant
- Energy trading
- Energy manager
- Settlement monitor / open-data-platform
- Mobility hub
- Charging stations
- Weather data
- Meter data management
- Siedlungsmanagement
- Smart home
- Energy manager / SPS
- District heating
- Heat pumps
- Buffer storage
- Hot water tank
- Battery storage
- Photovoltaics
- Other buildings
- Energy manager
- Energy trading
- Virtual power plant
- Energy manager
- Settlement monitor / open-data-platform
- Mobility hub
- Charging stations
- Weather data
- Meter data management
- Siedlungsmanagement
- Smart home
- Energy manager / SPS
- District heating
- Heat pumps
- Buffer storage
- Hot water tank
- Battery storage
- Photovoltaics
- Other buildings
- Energy manager
SmartCity Cologne

Climate Street

• An exemplary model to show all measures of the project in an effective public way

• Content:
  – LED Street Lighting with up to 70% electricity cost savings
  – Transformer station is refitted with measuring technology
  – Free Wi-Fi hotspot for public use and Data transfer from RheinEnergie projects
  – Environmental sensors (CO$_2$, Dust, No$_x$, Noise, …)
  – Parking Sensors
SmartCity Cologne
Climate Street

- Visualization:
  - red = occupied
  - blue = free
- Overview with all parking spaces
- Application development started
The tourist-, hotel-, private- and cargo-ships anchored in Cologne now have the chance to change their power and heat supply from diesel to electricity. For this purpose RheinEnergie installed a power supply at the piers of different harbors in Cologne.

Benefit: Less noise and environmental pollution
Thank you for your attention