

Integrated Electric Mobility: From vision to reality?





Applied Research Center:

Science



German Aeronautics and Space Research Centre

Research

Social Science Center Berlin



Hybrid Institute



T-Systems International GmbH

Siemens AG



DB Mobility Logistics AG

Industry

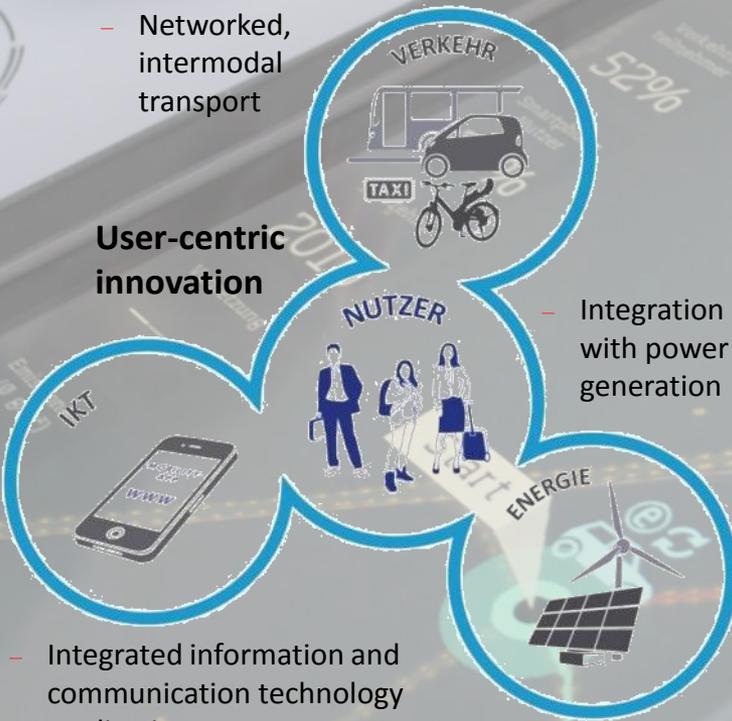
Practice

Focus of our work:

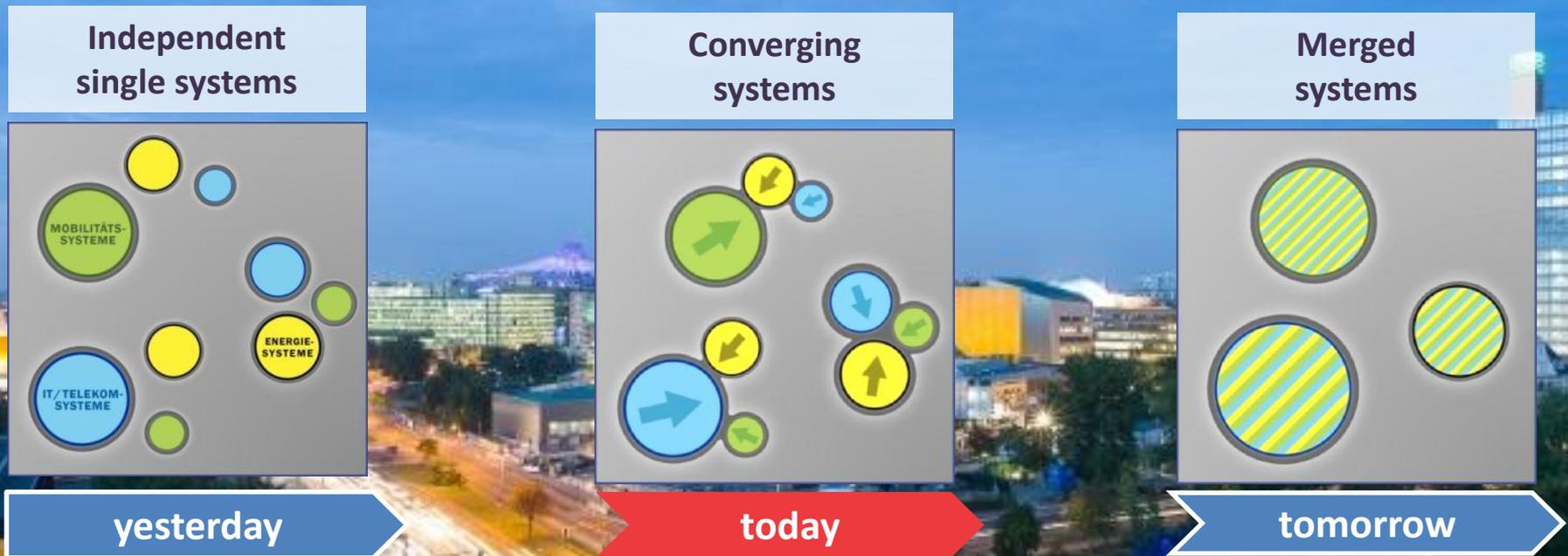
- Networked, intermodal transport

User-centric innovation

- Integration with power generation



- Integrated information and communication technology applications



 **Transport/
mobility**

 **Information and communications
technology (ICT)**

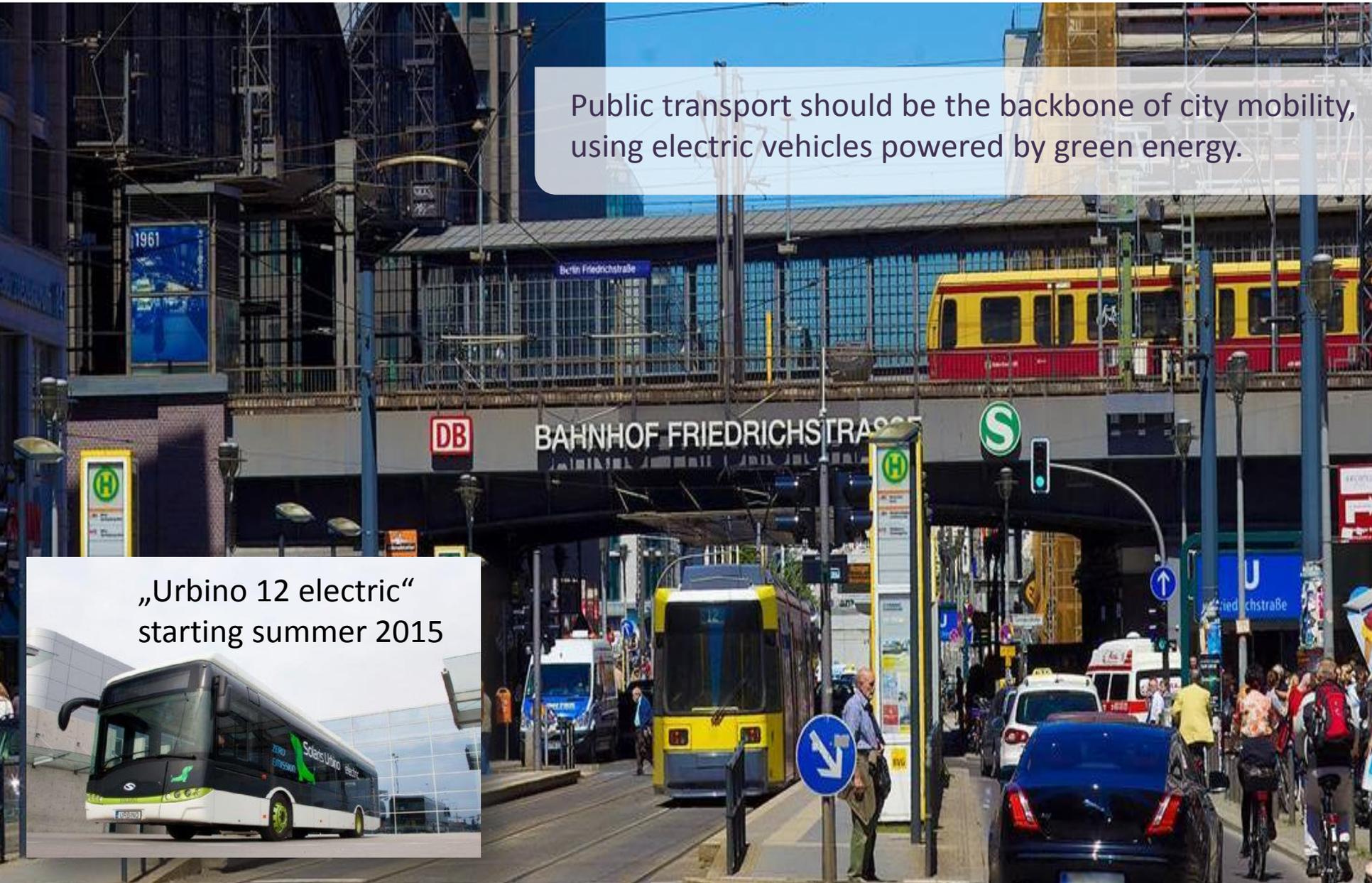
 **Energy**

Vision: The city of the future is smart. Mobility is interconnected, easy to use and CO₂-free.



Public transport should be the backbone of city mobility,
using electric vehicles powered by green energy.

„Urbino 12 electric“
starting summer 2015



E-bike and e-scooter sharing systems are to complement public transport.



Cities profit from e-car sharing fleets: less cars in the streets, less noise and less pollution.



E-car sharing should profit from free parking and cities should build up charging infrastructure.



Vision InterOpt

Las Vegas 01/2015



The city car of the future is a zero emission,
self driving e-vehicle in a ride sharing system.



Berlin 10/2012



BahnCard 25 mobil plus

Future mobility systems have to be fully integrated. Easy access to different modes.



12.13

GÜLTIG VOM: 09.12.12 BIS: 08.12.13

Tom Wegener

7081 0000 0000 0000

HK
943

Energy and mobility systems have to be integrated.
29% of primary energy is used in the mobility sector.

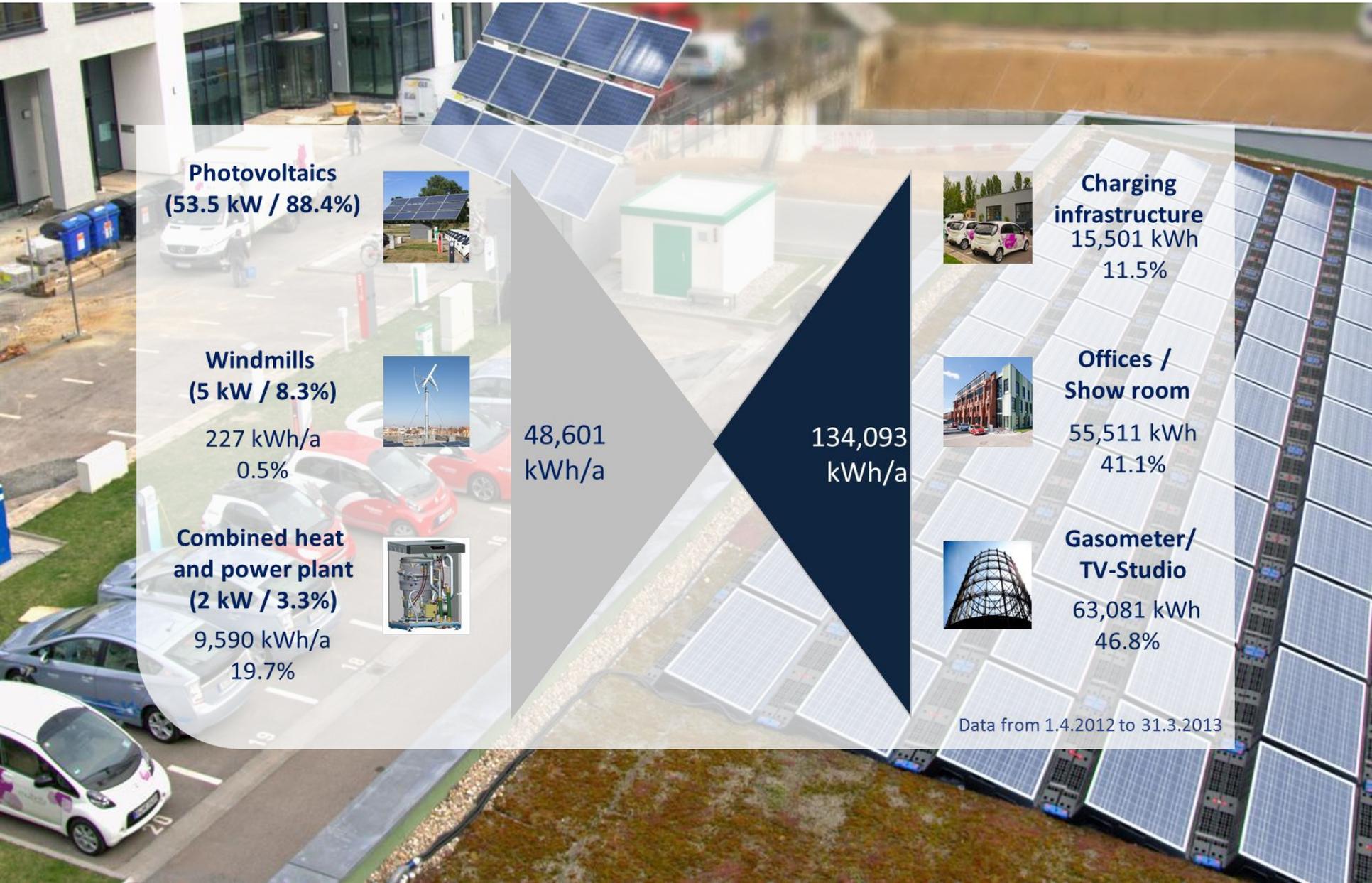
Das MICRO SMART GRID auf dem EUREF-Campus

The infographic details the MICRO SMART GRID project on the EUREF campus. It features a central map of the campus with various energy infrastructure elements highlighted. Key components include solar panels, wind turbines, and energy storage units. The project is supported by partners like FALDO-LEBER BRÜCKE, SCHÖNBERG, and SÜCKRELEZ. A legend identifies symbols for solar, wind, and storage. The date 15.06.2012 is noted at the bottom.



An aerial photograph of a modern building with a large array of solar panels on its roof. In the foreground, a parking lot contains several cars, some of which are plugged into charging stations. A white delivery truck is parked nearby, and a small utility building with a green door is visible. The scene is set in an urban environment with a mix of greenery and paved areas.

E-Mobility (managed charging, V2G) can be an essential part of an integrated and smart grid.



Photovoltaics
(53.5 kW / 88.4%)



Windmills
(5 kW / 8.3%)



227 kWh/a
0.5%

**Combined heat
and power plant**
(2 kW / 3.3%)



9,590 kWh/a
19.7%

48,601
kWh/a

134,093
kWh/a

**Charging
infrastructure**
15,501 kWh
11.5%



**Offices /
Show room**
55,511 kWh
41.1%

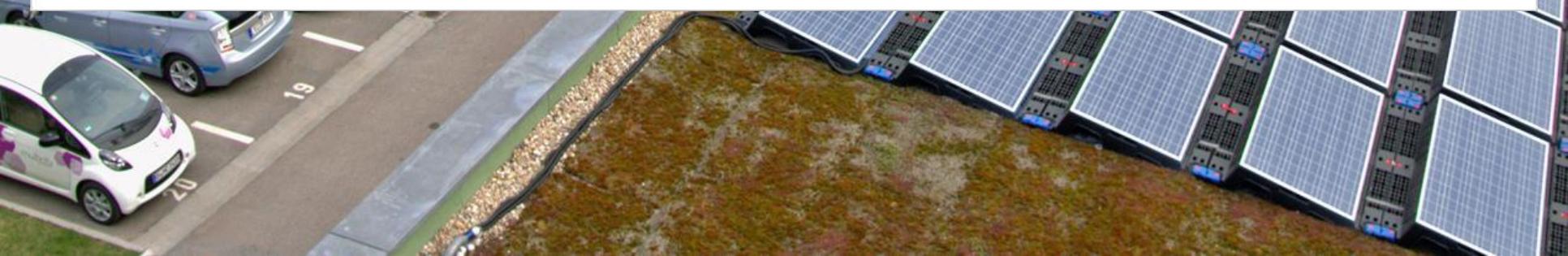
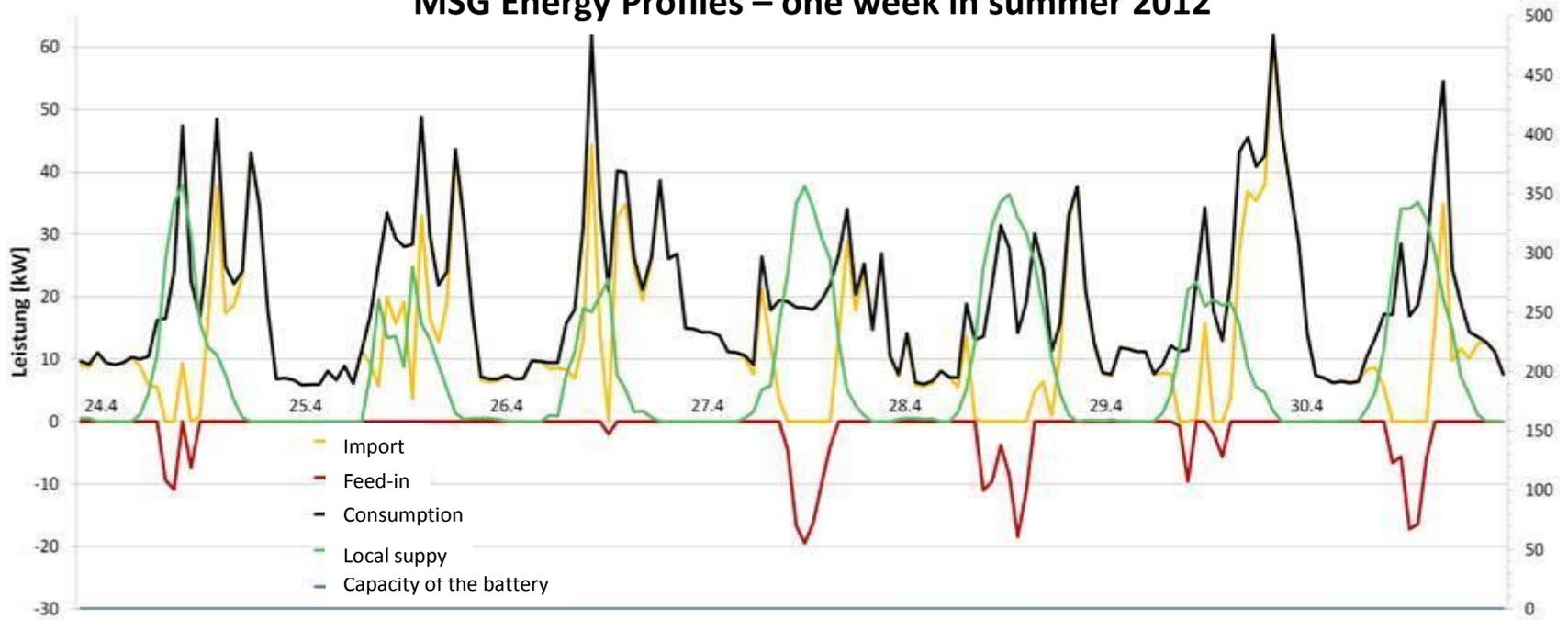


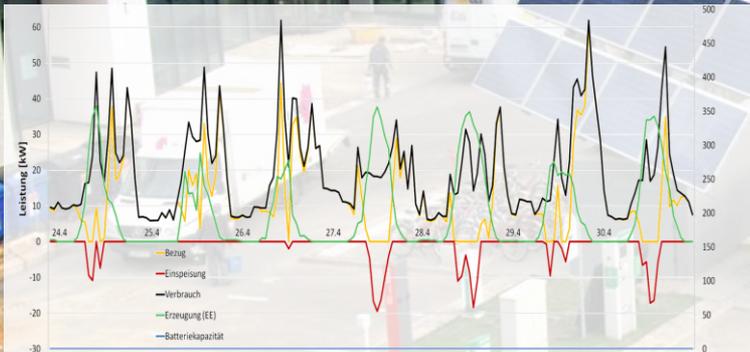
**Gasometer/
TV-Studio**
63,081 kWh
46.8%



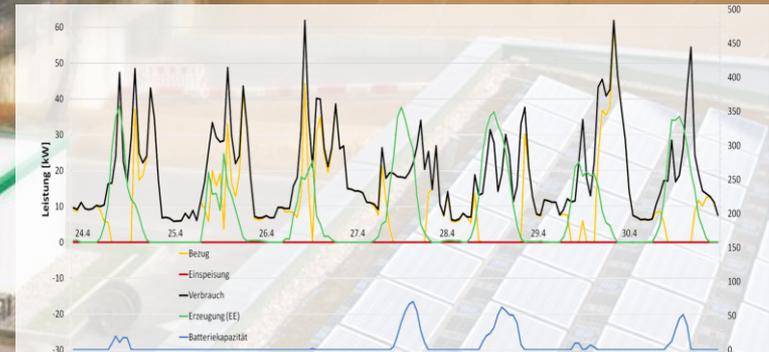
Data from 1.4.2012 to 31.3.2013

MSG Energy Profiles – one week in summer 2012





- **76.1%** of local energy production could be used without buffering – within one year that would amount up to 36,985 kWh **self consumption**



- **Simulation: 96.2%** of local energy production could be used **with buffering** – within one year that would amount up to 46,757 kWh **self consumption**

**9,772 kWh less energy could be taken from the city grid,
local energy usage (internal consumption) could be raised by 20%**

Simulation



Load levelling allows to shift, without shifting consumption local supply would exceed

MSG Energy Profiles - one week in summer 2013



Over 80% of local energy production is used on campus (82% to 86%) and peak load is lowered (spread 11% to 32%) (depending on quality of prognostics)

Standard e-cars and charging infrastructure
need to be V2G-ready





The station of the future should be a multimodal hub,
it should generate and use green energy.

Green Energy at Südkreuz station





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