Integrated Electric Mobility: From vision to reality?


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Science
Research
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WZB
Hybrid Institute
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T
T-Systems International GmbH
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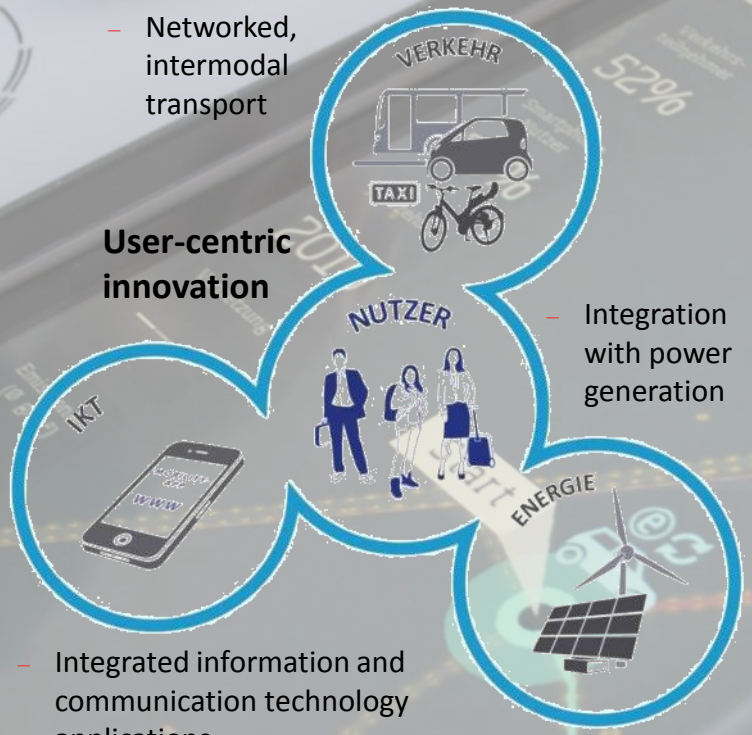
SIEMENS
DB
DB Mobility Logistics AG
Industry
Practice

Focus of our work:

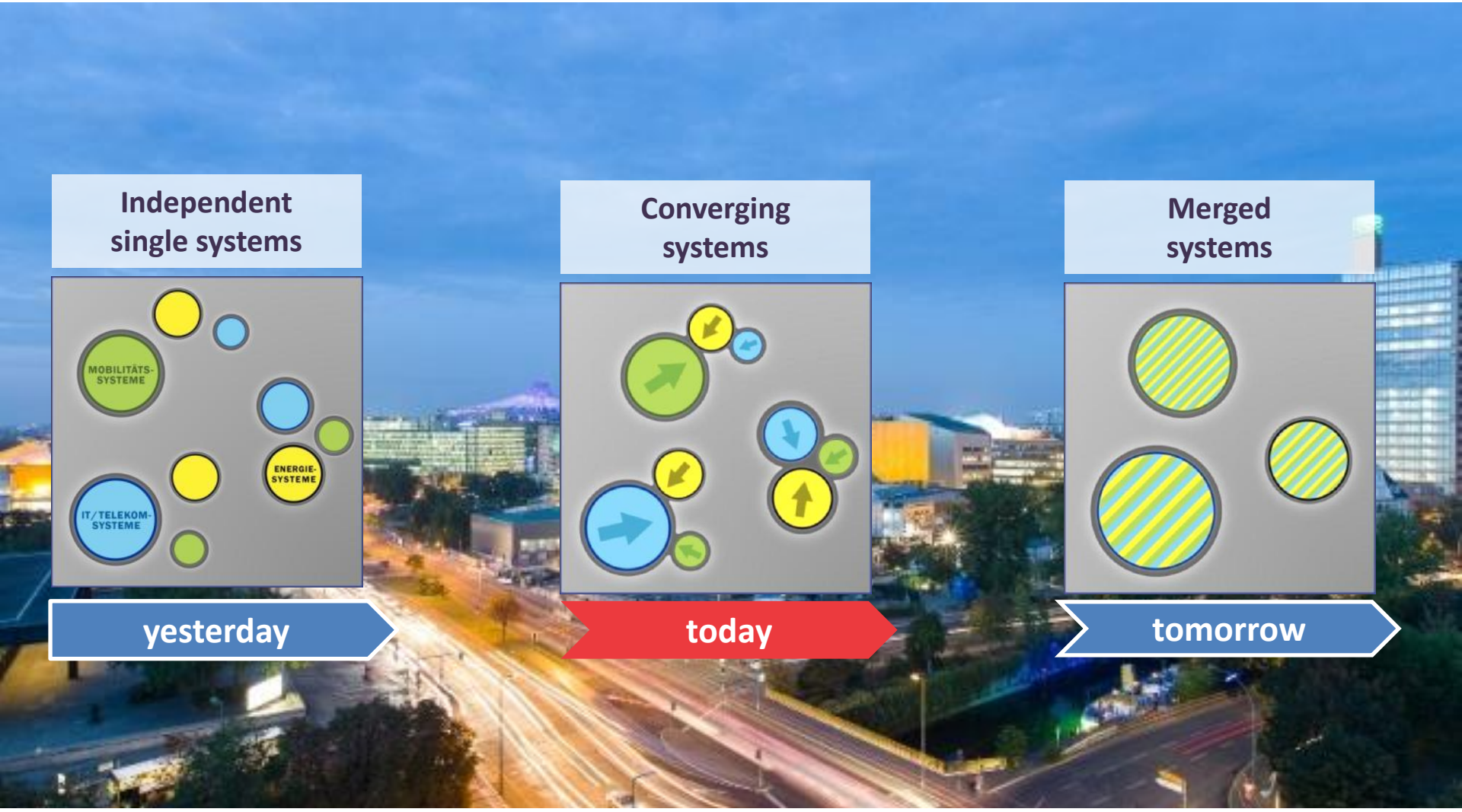
- Networked, intermodal transport

User-centric innovation



- Integration with power generation

- Integrated information and communication technology applications



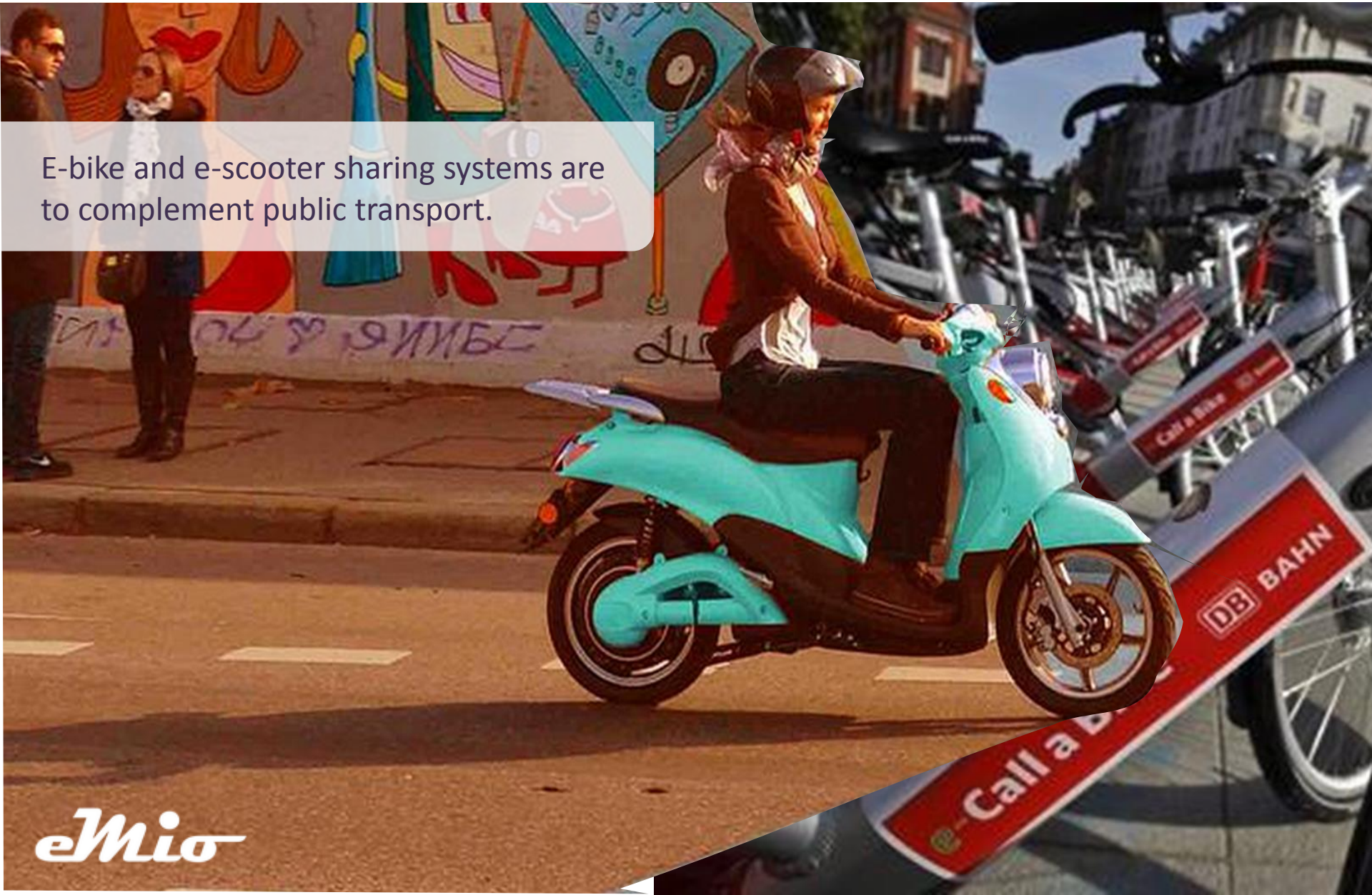
Transport/ mobility

Information and communications technology (ICT)

Energy

Vision: The city of the future is smart. Mobility is interconnected, easy to use and CO_2-free.

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



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.

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

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

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

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%

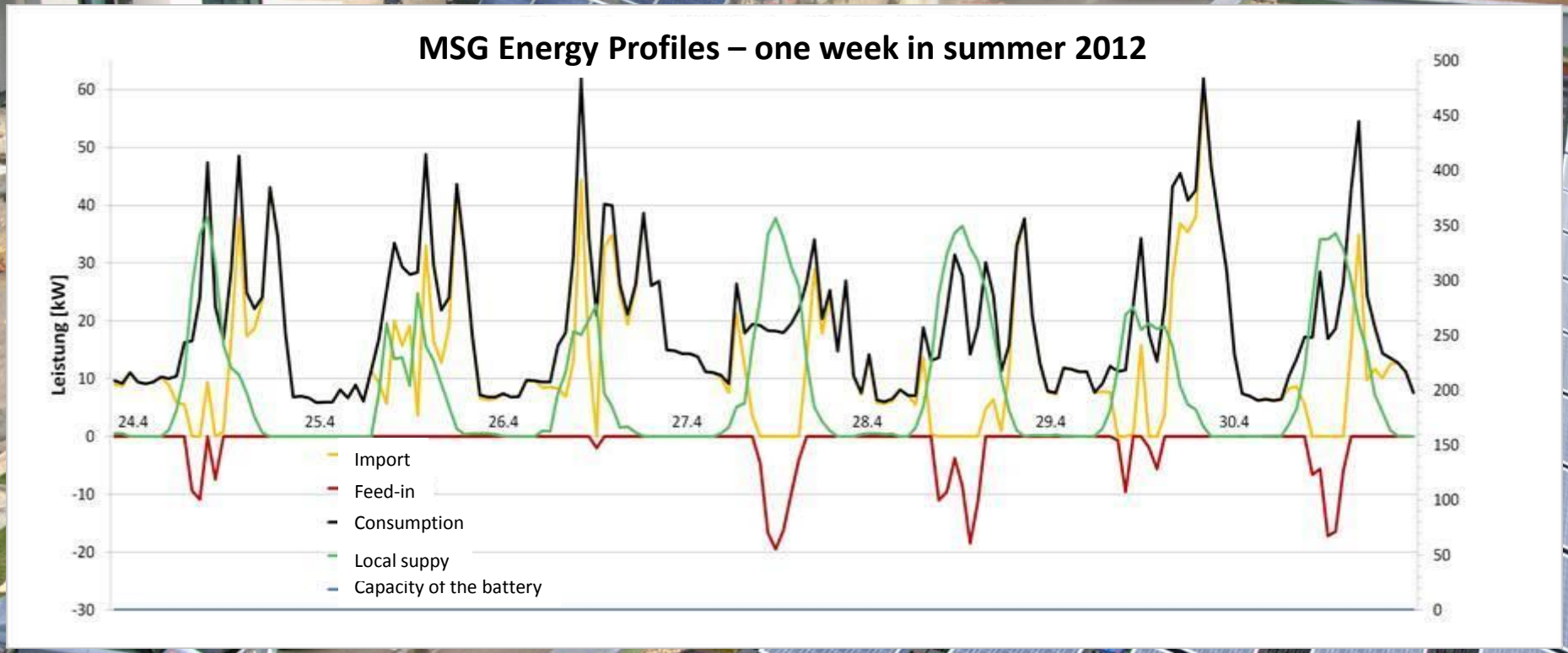
Offices / Show room

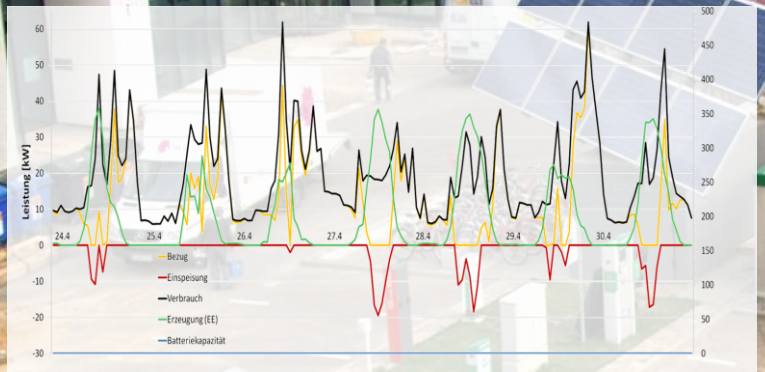
55,511 kWh
41.1%

Gasometer/ TV-Studio

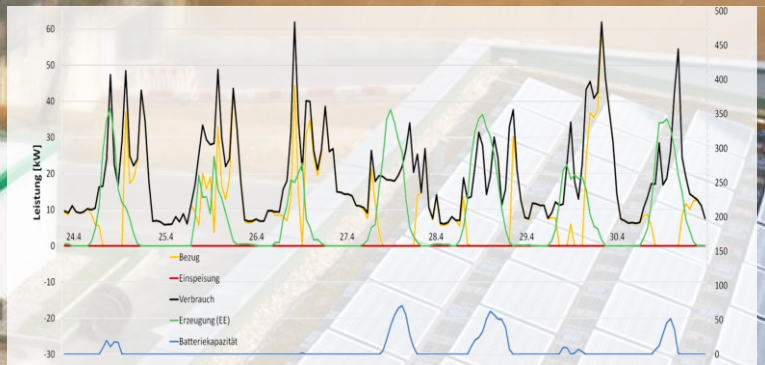
63,081 kWh
46.8%

Data from 1.4.2012 to 31.3.2013


MSG Energy Profiles – one week in summer 2012
Leistung [kW]
60
50
40
30
20
10
0
-10
-20
-30
500
450
400
350
300
250
200
150
100
50
0
24.4
25.4
26.4
27.4
28.4
29.4
30.4
Import
Feed-in
Consumption
Local suppy
Capacity of the battery



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

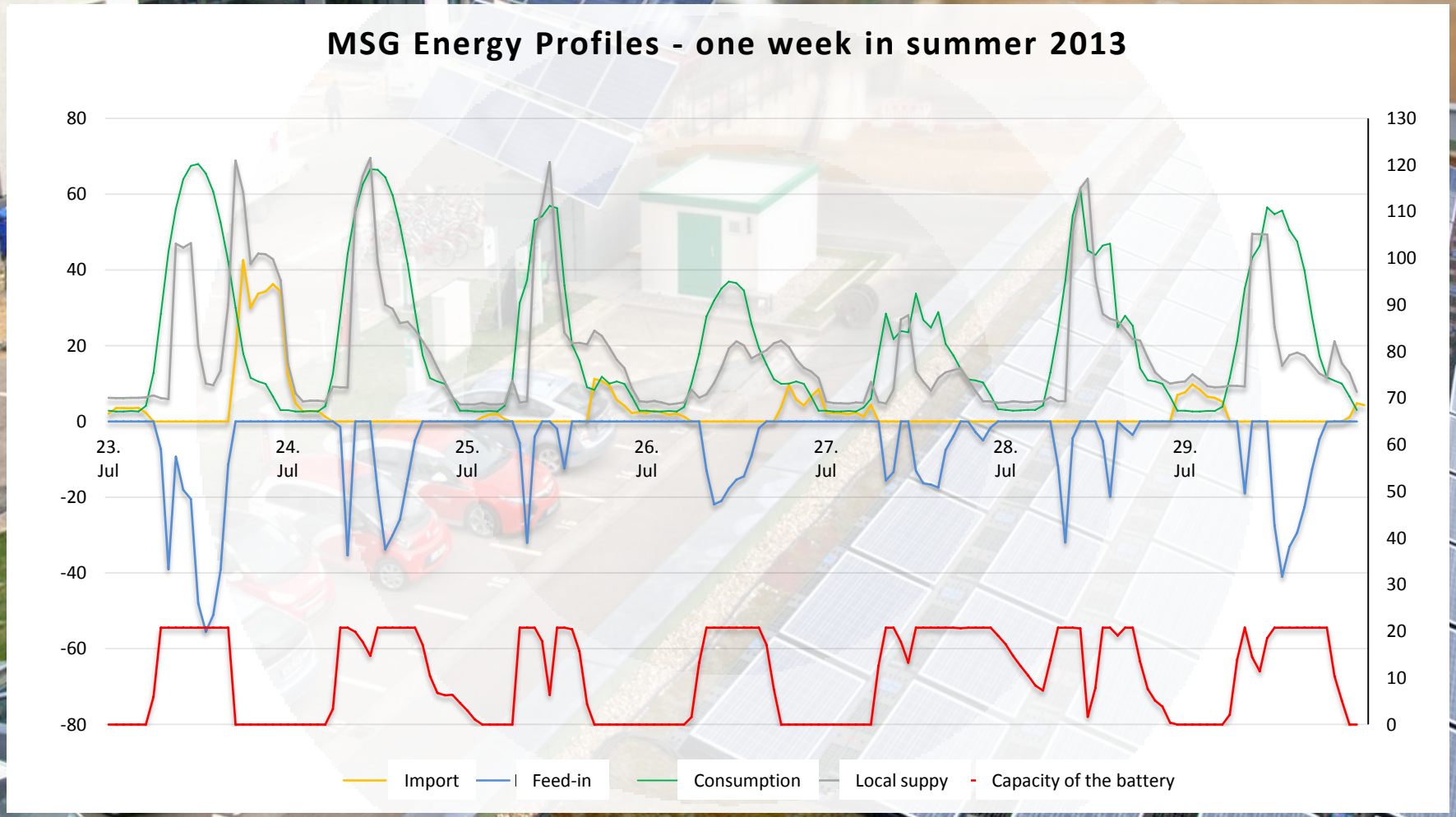


- **Simulation: 96.2%** of local energy production could be used **with buffering** – within one year that would amount up to 46,757 kWh self consumption

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



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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