

Workshop on DSM Potentials, Implementations and Experiences

SGMS-HiT

Smart Grids Model Region Salzburg

Buildings as interactive participants in Smart Grids:
a demonstration project for DSM

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Design: thalmeter architektur

Flyover Pictures



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Smart Grids Modell Region Salzburg – Buildings as interactive participants in Smart Grids

- A demonstration building is to be planned and constructed as flagship project, in order to investigate the possibilities and benefits of Smart Grids in connection with buildings, which should then be brought to the attention of the broad public to make this topic visible and concrete



Foto: DI Christof Reich

*„Grid friendly“
Building*

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What is a „grid friendly“ building ?

The building must be able to contribute to a **reduction of peaks in the grids** (electricity, district heating, gas).

- The **HVAC-Systems** must be able to react to a certain requirement of the grid
- The **residents** must be able to react to a certain requirement of the grid. To do so, they need:
 - **Information**
 - **Devices** which make an interaction possible
 - **Incentives**



Foto: DI Christof Reich

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... the HVAC-Systems (room heating, domestic hot water)

1st Aspect

The point in time

when **energy is taken from the grid** and
when **energy is used by then residents**
should be separated.

- Energy should be taken from the grid when it can be provided by the grid operator as efficient as possible
- **The comfort of the users must not be harmed in any way.**

➔ *Storage systems*




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... the HVAC-Systems (room heating, domestic hot water)

2nd Aspect

Different energy sources should be used in the point of time when their consumption has a positive impact on the status of the grid or when the use of an other energy source would be very inefficient.

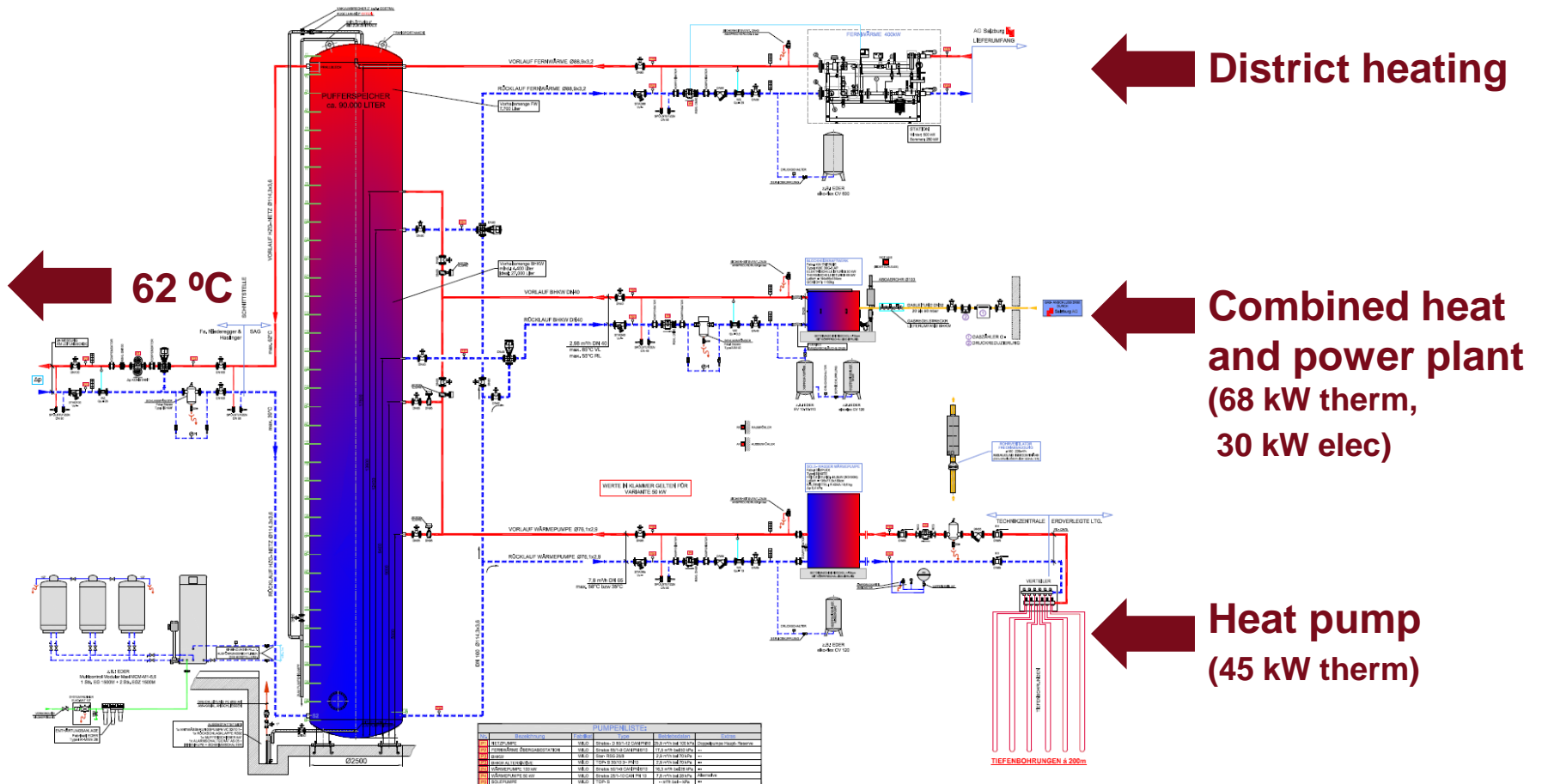
- **biogas**
- **electricity**
- **district heating**

 *Different heat sources based on different energy sources*



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... three heat sources feeding into one storage tank

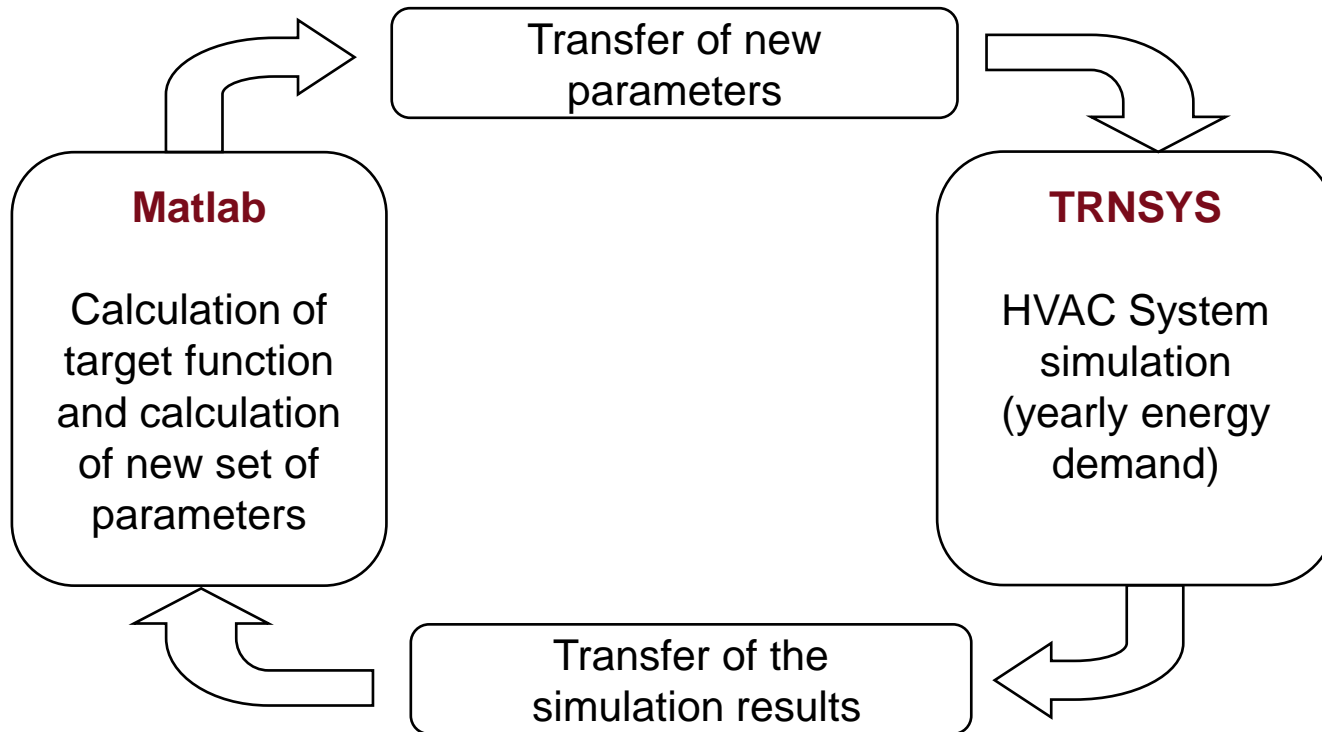


90m³ Hot water storage tank

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... short excursion

Method for optimisation of system design



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... definition of 3 operating modes based on daily market price forecast



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... definition of 3 operating modes

RED (shortage in the electric grid):

- 1st: CHP
- 2nd: district heating
- 3rd: heat pump

YELLOW Winter:

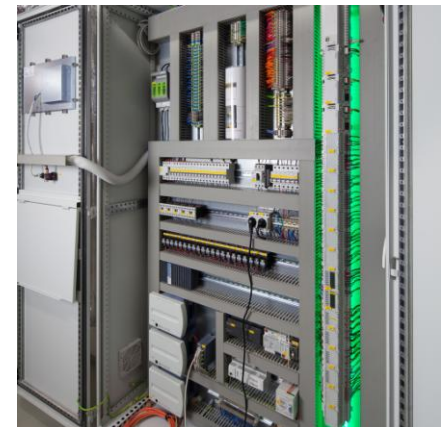
- 1st: heat pump
- 2nd: CHP
- 3rd: district heating

YELLOW Summer:

- 1st: heat pump (PV) / district heating (PV)
- 2nd: district heating (PV) / heat pump (PV)
- 3rd: CHP

GREEN (surplus in the electric grid):

- 1st: heat pump
- 2nd: district heating
- 3rd: CHP

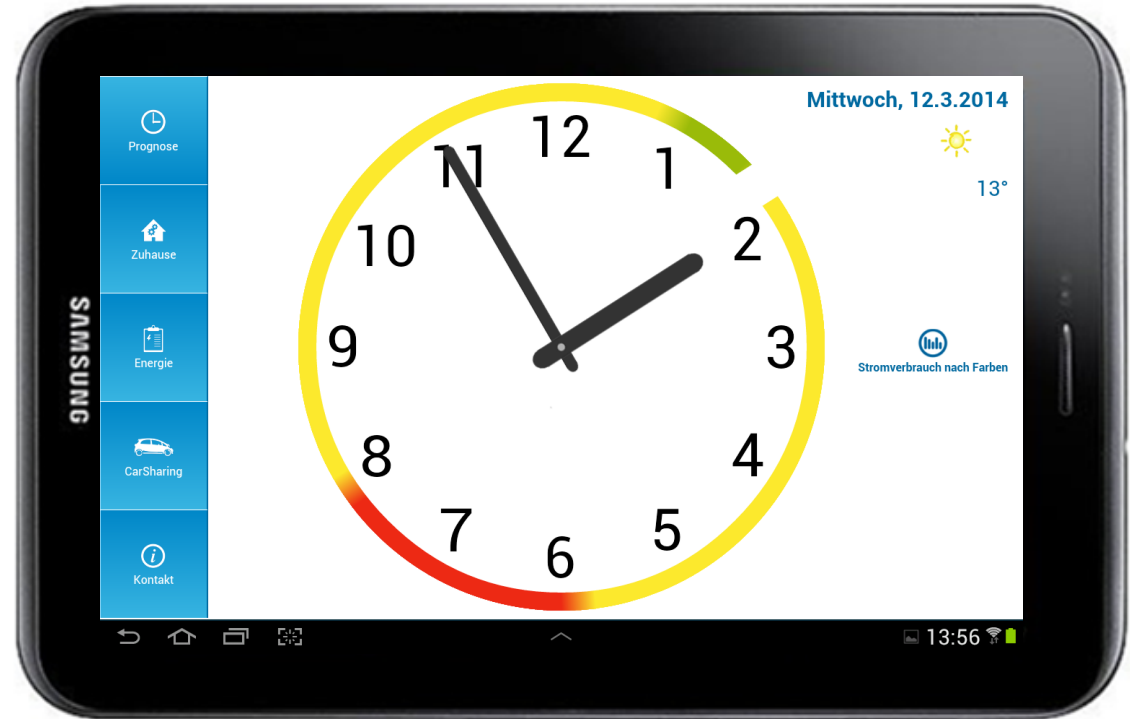


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... User Interaction

- **FORE-Watch**

Forecast for the next 12 hours



- **(simulated) tariffs for electric energy**

RED: standard tariff + 5 cent / kWh

YELLOW: standard tariff

GREEN: standard tariff – 5 cent / kWh

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... User Interaction

- **Energy Feedback**

Provides information on a daily basis in which phase the user has used electric energy and if his behaviour will lead to

a reduction of costs or to

additional costs.



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... Next Steps

- On 1st of April a **1-year field test** started in which the impact of the installed measures will be evaluated by **monitoring** and **interviews**.



Foto: DI Christof Reich



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Häuser als interaktive Teilnehmer im Smart Grid
Buildings as interactive participants in Smart Grids

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