Microgrid Lab 100%

Testbed for the development of control algorithms for microgrids

Graz, 22.01.2020

Stefan Aigenbauer

Objective: Real-life microgrid testbed

- Technology- und Research Centre (tfz) Wieselburg and the new firefighting department
- Existing technologies: two wood chip boilers, thermal storage devices, absorption chiller,…
- Newly installed technologies: photovoltaic system, battery, electrical vehicle - charging

➢ Technology- and Research Center (tfz)

direct use of PV-electricity

enough capacity for district heat

➢ New fire fighting department next to tfz

Why Microgrid Lab?

The project “Microgrid Lab 100%” enables a real application for the developments of following two ongoing basic research projects:

“OptEnGrid” (FFG 858815):
- ***planning and optimization software tool*** *for microgrids*

“Grundlagenforschung Smart- und Microgrid“
microgrid controller concepts:

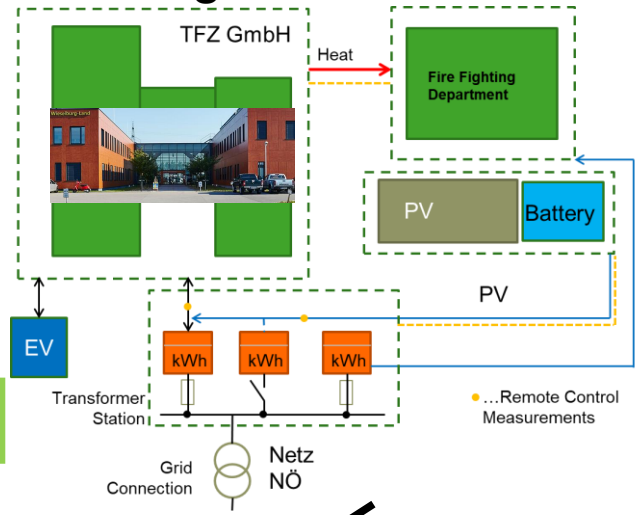
planning

improvement

testing

further development

Microgrid testbed:



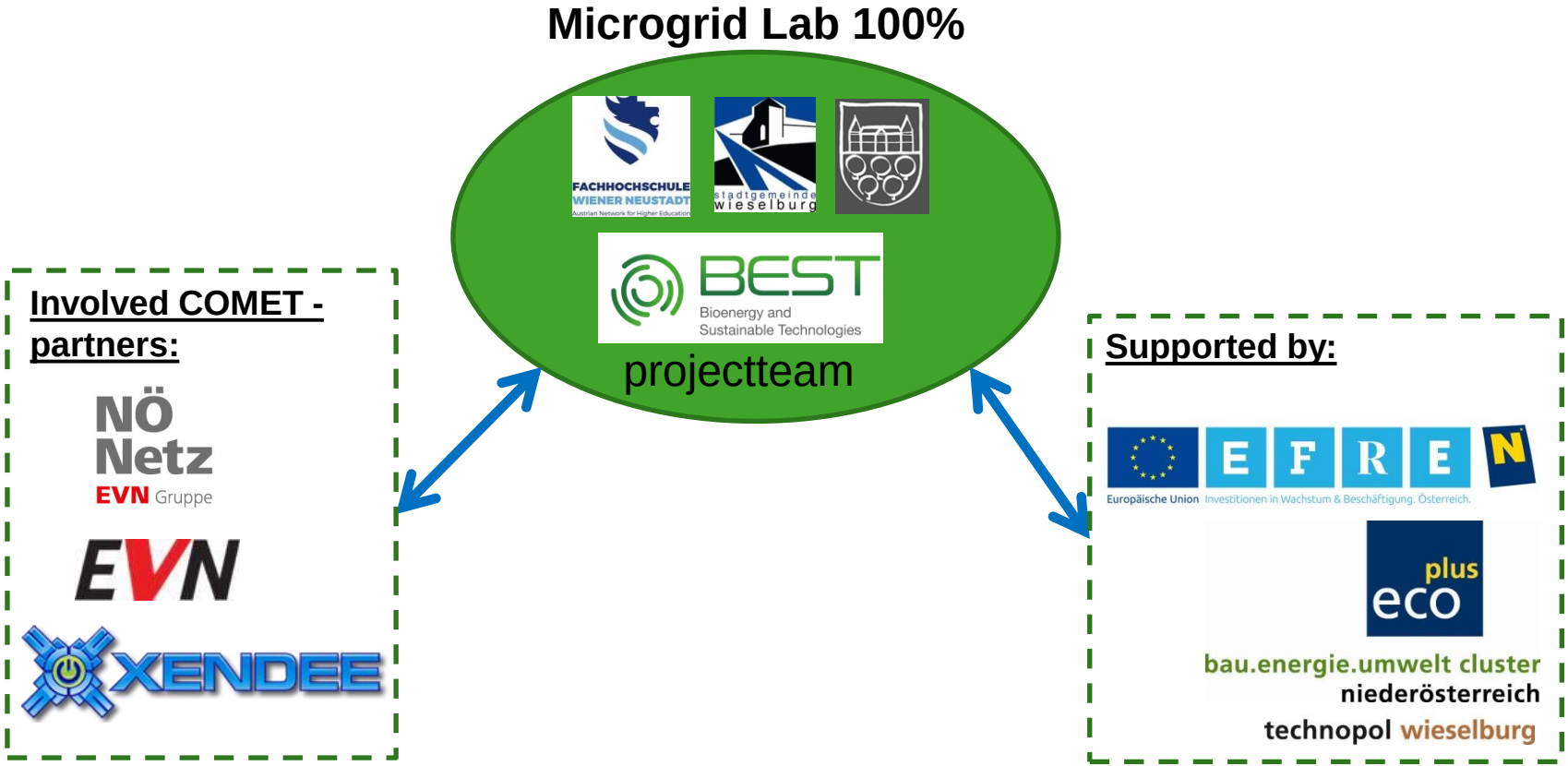
development of control algorithms, technologies and services for microgrids

Project facts:

Title:	**MICROGRID LAB 100%**
Costs:	**€ 640.000.-**
Start:	**1.1.2019**
Duration:	**3 years**

funded by the government of Lower Austria

Project Partners:



New technologies for the Microgrid Lab

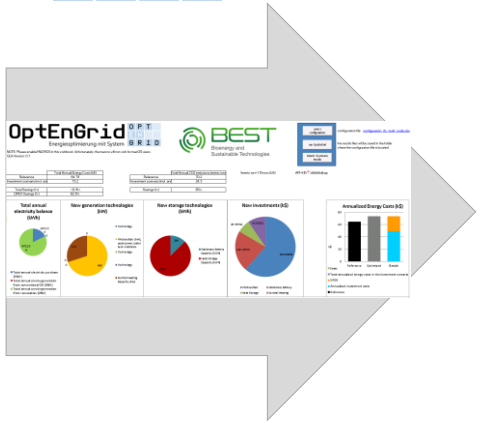
current situation:

biomass boilers
2 x 220 kW

100% public
electricity grid

emissions: 90t CO_2/a
energy costs*: 78 000 €/a

OPT EN GRID



target function: CO_2 minimization**

Microgrid lab 100%:

biomass boilers
2 x 220 kW

optimised with new technologies:

74 kWp PV

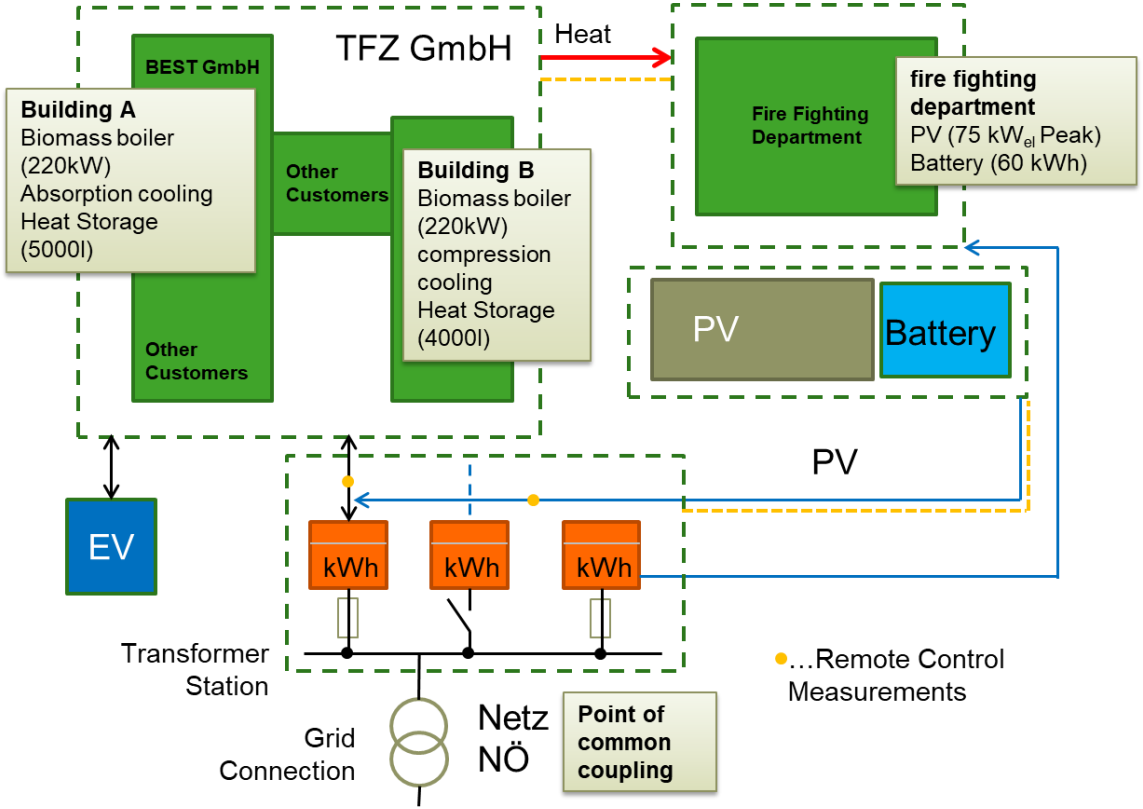
60 kWh battery storage

~75% public electricity grid

emissions : 74t CO_2/a **-18%**
energy costs*: 68 800€/a **-12%**

*including amortisation of investments
**limited to max. 500m² roof area

Planning the Microgrid Lab



Implementation of Microgrid Lab

installation of PV

battery

microgrid connection point

district heating installations

new firefighting department

point of common coupling

Next steps and Outlook

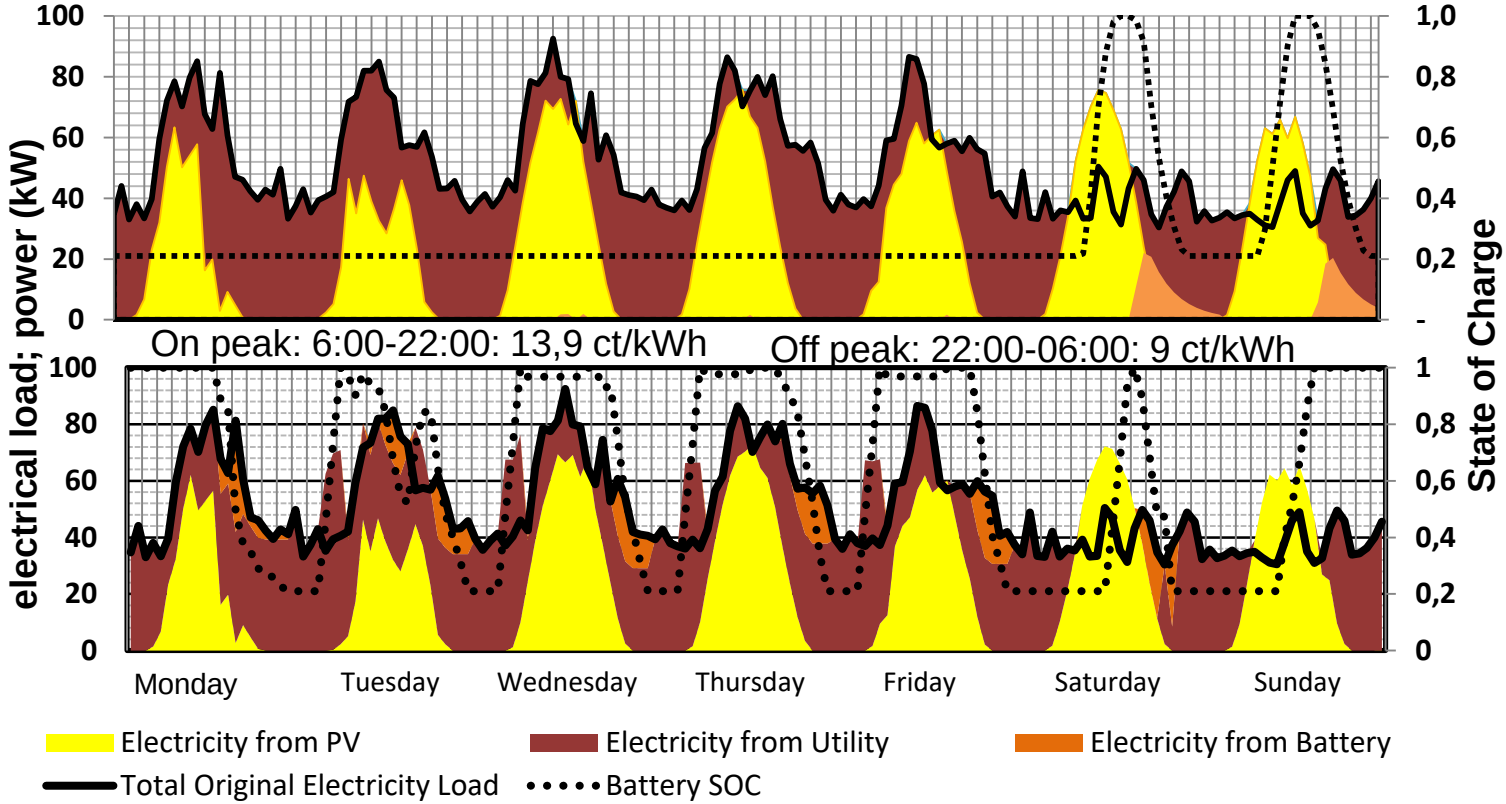
- Monitoring of electricity, heating and cooling demands; evaluation of user behaviors
- Verification and improvement of optimization software tool
- Implementation of developed microgrid controller algorithms
- Creating test cycles to evaluate the used technologies and for further development of microgrid controller strategies
- Workshop with interested companies and stakeholders to create concepts for business plans and product development of microgrid components or services

In future the Microgrid Lab will act as testbed for technology providers and manufactures as well as different energy suppliers and new emerging sectors.

Outlook: development of advanced controller

1) standard load controller

2) example: advanced microgrid controller

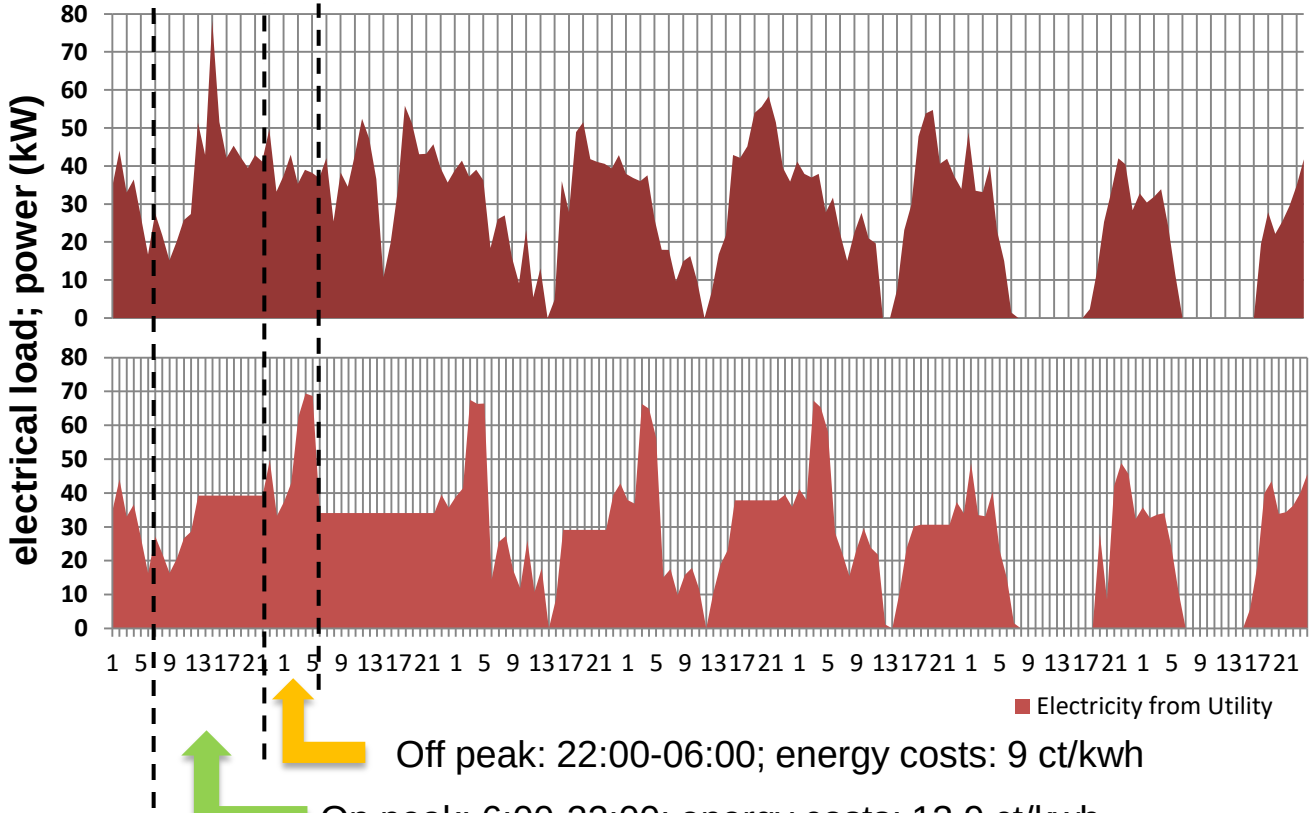


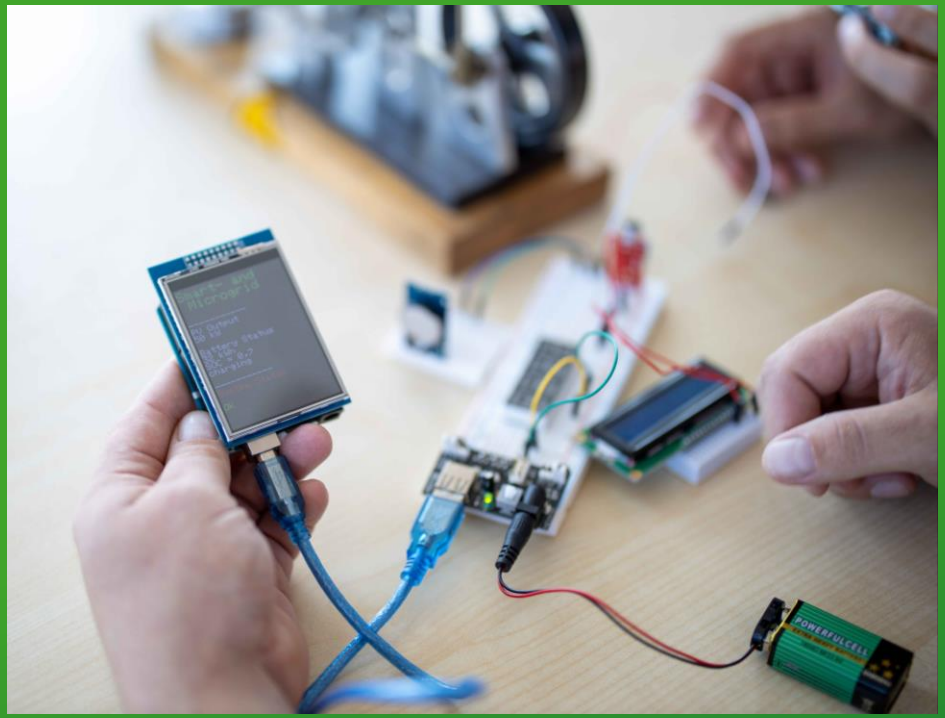
Outlook: development of advanced controller

1)
standard
load controller
€672.-/week

2) example:
advanced micro-
grid controller
€592.-/week

-12 % cost reduction





Michael Stadler; michael.stadler@best-research.eu; T +43 (0) 502378– 9425
Michael Zellinger; michael.zellinger@best-research.eu; T +43 (0) 502378– 9232
Stefan Aigenbauer; stefan.aigenbauer@best-research.eu; T +43 (0) 502378– 9247