

0054 – Innsbruck's cross-linked energy system prototype

Reinhard Fohringer
Innsbrucker Kommunalbetriebe AG, Austria

Sophia Neuner
Innsbrucker Kommunalbetriebe AG, Austria

Fast change in power supply structure towards renewable energy sources

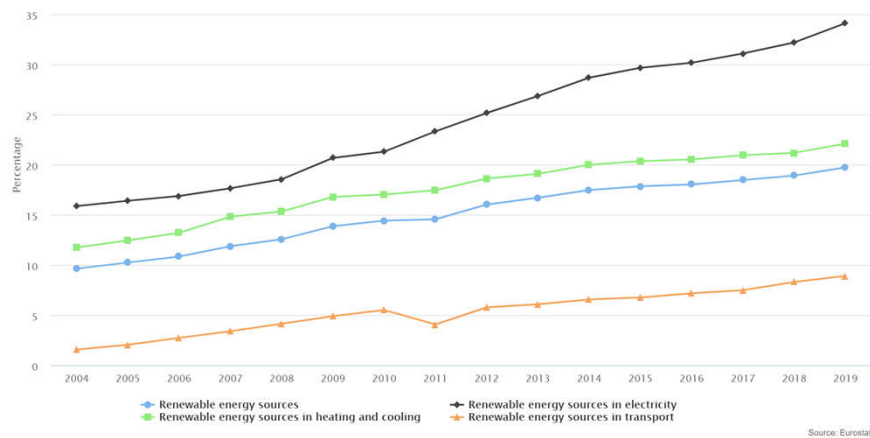


Figure 1: Share of energy from renewable sources in the EU member states in % (Eurostat 2020)

Security of supply

Increasing electricity production from many small generators in low network levels leads to challenges for security of supply.

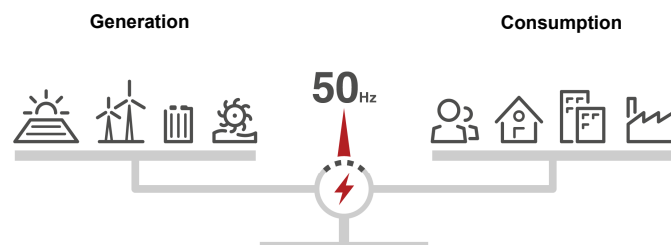
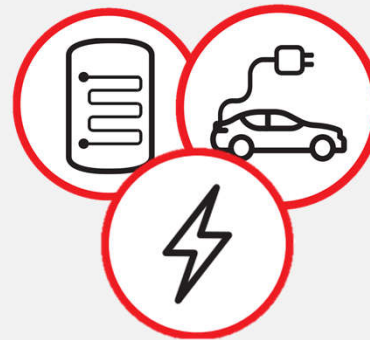


Figure 2: Power grid stability depends on the balance between generation and consumption (EBL 2016)

Sector coupling

Enables decentralized renewable energy to be used in other sectors. Software that intelligently allocates energy flows in the different sectors can help integrate large amounts of renewable energy into the system and reduce the impact on the distribution network.



Such software, called Energy Management System, was developed at the IKB-Smart-City-Lab that controls the following units:

- Combined Heat and Power plant
- Heat pumps (energy source: sewage water)
- Heat buffer storage
- Photovoltaic
- Battery storage
- Charging stations

Energy Management System (EMS):

Automatically controls and allocates cross-sectoral energy flows and cover short- and medium-term fluctuations.

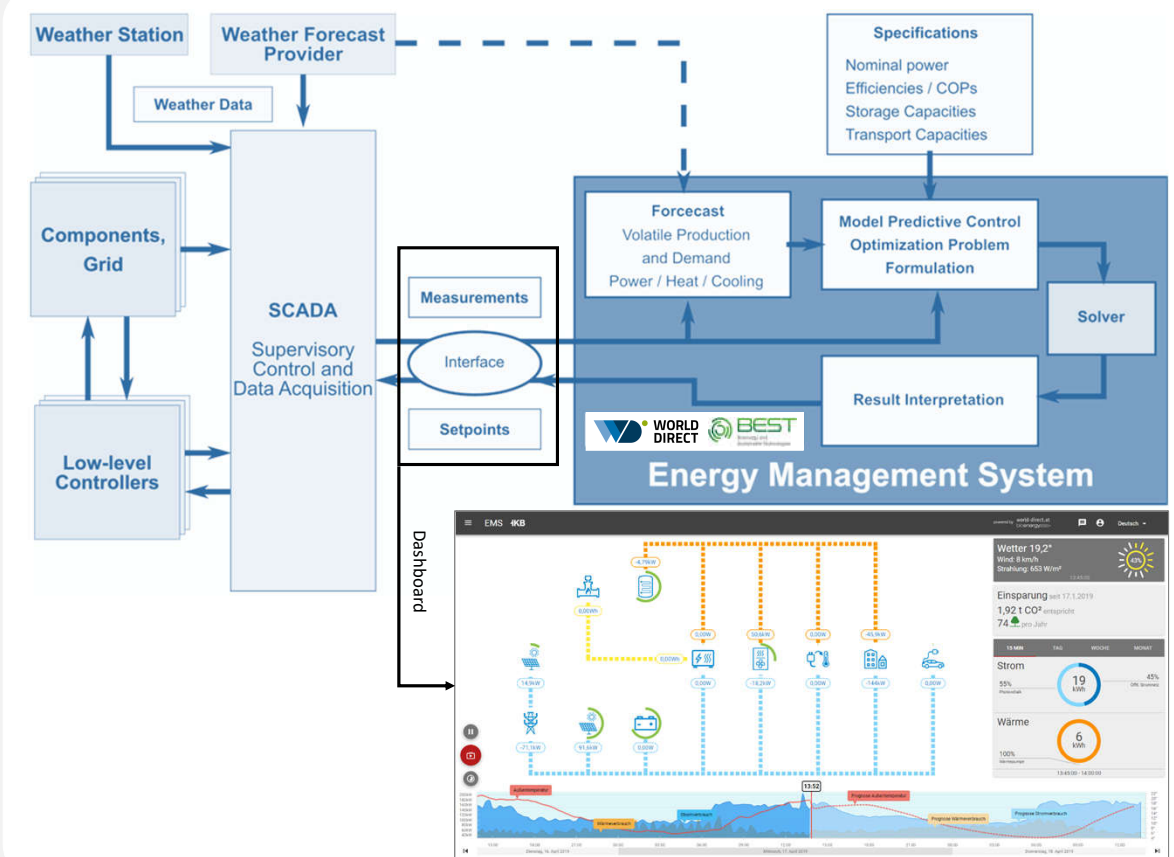


Figure 3: Energy management system creates schedules for IKB plants based on parameters: expected power exchange price, temperature and global radiation. Created by BEST and World Direct.