Austrian perspectives towards energy flexible buildings

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Today’s tour programme

- Austrian framework, energy data and challenges
- National characteristics and needs on energy flexible buildings
- Austrian SRI discussion and outlook
Today’s tour programme

Austrian framework, energy data and challenges
#mission2030 – Austrian Climate and Energy Strategy (2018):

- 100 % electricity from renewable energy sources in 2030
- No oil-fired heating systems from 2020 for new buildings
- Increase the flexibility of the energy system
Final energy consumption and electricity generation

2016

- **Fernwärme**: 7%
- **Kohle**: 2%
- **Erdölprodukte**: 38%
- **Biomasse etc.**: 16%
- **Erdgas**: 17%
- **Strom**: 20%

20% Anteil Strom am Endenergieverbrauch

Source: Statistik Austria (2018)

72% Renewables in electricity production:
- 56% Hydropower
- 16% Wind, PV and biomass CHP
- Plus 28% mainly gas fired CHP plants

Source: Association of Austrian Electricity Companies 2019, based on Statistics Austria 2017/2018
Share of renewable energy covering the electricity consumption 2016

Anteil erneuerbarer Energien am Stromverbrauch 2016

Angaben in Prozent

Source: Association of Austrian Electricity Companies 2019, based on EUROSTAT 2018
“Energy Supply:
The future of Austria’s energy supply continues to depend on a combination of conventional and renewable energy sources as well as on power grids and gas networks with adequate capacities.”

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National characteristics and needs on energy flexible buildings
National characteristics

Less duck curve problems!

Source: The GridOptimal™ Initiative, New Building Institute 2018
National characteristics

Self-sufficiency Goals!

Deckung des Strombedarfs (Stundenbasierte Monatswerte)

Januar: Eigendeckungsraten (ohne Speicher) 37%, Anteil Speicher an Eigenbedarfsrate 12%, Netzbezugsrate 52%
Februar: Eigendeckungsraten 37%, Anteil Speicher 12%, Netzbezugsrate 52%
März: Eigendeckungsraten 37%, Anteil Speicher 12%, Netzbezugsrate 52%
April: Eigendeckungsraten 37%, Anteil Speicher 12%, Netzbezugsrate 52%
Mai: Eigendeckungsraten 37%, Anteil Speicher 12%, Netzbezugsrate 52%
Juni: Eigendeckungsraten 37%, Anteil Speicher 12%, Netzbezugsrate 52%
Juli: Eigendeckungsraten 37%, Anteil Speicher 12%, Netzbezugsrate 52%
August: Eigendeckungsraten 37%, Anteil Speicher 12%, Netzbezugsrate 52%
September: Eigendeckungsraten 37%, Anteil Speicher 12%, Netzbezugsrate 52%
Oktober: Eigendeckungsraten 37%, Anteil Speicher 12%, Netzbezugsrate 52%
November: Eigendeckungsraten 37%, Anteil Speicher 12%, Netzbezugsrate 52%
Dezember: Eigendeckungsraten 37%, Anteil Speicher 12%, Netzbezugsrate 52%

Source: PV Opti – Tool, FHNW, Switzerland
A **blackout** is a prolonged, large-scale power outage. Exactly what constitutes a blackout is not clearly defined quantitatively in terms of time and space.

They can be caused by technical faults, extreme weather, human error but also terrorist attacks and sabotage. The larger the affected area, the more difficult and tedious it will be to restore power.

Source: Association of Austrian Electricity Companies  2019
National characteristics

Load: Power Austria 2017

*Load: Heating Austria 2017

Heating vs. electricity consumption

„Big Whale – Calm Sea“ discrepancy
District heating stakeholder survey

Challenges in load management

Source: Questionnaire on stakeholder's perception - 37 respondents, AEE INTEC
District heating stakeholder survey

Importance of energy flexible buildings

<table>
<thead>
<tr>
<th>Importance</th>
<th>Responding Stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>not important</td>
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<tr>
<td>of little importance</td>
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</table>
District heating stakeholder survey

→ Relevance of the topic is higher than expected!
Today’s tour programme

Austrian SRI discussion and outlook
Smart Readiness Indicator (SRI)

MOTIVATION - SMART BUILDINGS

Smart Building

Measure the technological readiness of your building

For or against introduction of the SRI

Q1 Wie stehen Sie grundsätzlich zur Einführung eines Smart Readiness Indikators - sind Sie dafür, oder dagegen?

Respondents: n=66
Pro SRI: 83,33%
Contra SRI: 16,67%
Q12 Der SRI ist als Teil des Gebäude-Energieausweises geplant. Wird die Bewertung damit marktrelevant?

![Bar chart]

**Respondents: n=62**
State of discussion on SRI

Smart Readiness?

Physical/Real Data Assessment

Technology- and Servicerating

User-supportive Smartness

Interfaces with energy generation / grid operators / overall energy system

Peak load characteristics, duration of the response, rebound-eff., EF Index → Interest of CO₂- und resource-reduction

Rating of existing technologies and services – mainly sustainable ones → Economic interests

Sustainable and resilient solutions; user-friendly displays; data privacy → Interest of the user
Conclusion

- Room for advanced energy targets and policy!
- No CO$_2$-emission reductions since 1990
- Hydropower and biomass-CHP plants currently „prevent“ from fluctuations, but are already limited for extension
- District heating is important and still expanding
- Wind and PV are supposed to increase
- Self consumption / autarkic rate is a key aspect
- SRI is not very welcome by the Austrian regions, but agreed to be important when asking the relevant stakeholders
Outlook

Is cooperative housing (at cluster or district level) the answer to smartness, flexibility, affordable living and (bio-) diversity?
Thank you for your attention!