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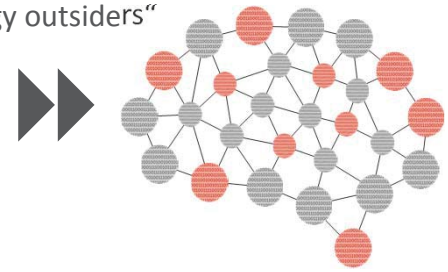
Impact of digitalization on the reform of energy networks and its contribution to sustainable growth, effectiveness and energy transition

Austrian Energy Agency
Herbert Lechner | January 28, 2019

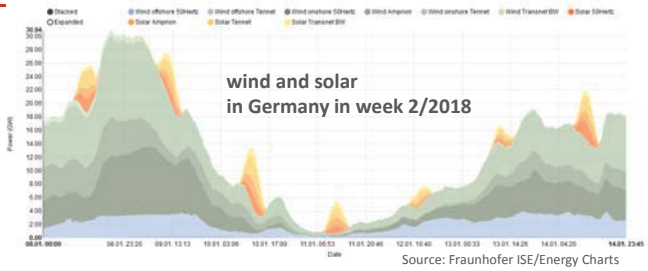
View of the energy industry

- expects strong impacts of digitalisation
- doubts that it can utilise the total business potential
- digitalisation will encourage the market entry of „energy outsiders“
- ICTs and energy start-ups will have highest benefits
- potential for profitable services for end users
  - energy efficiency advice/energy management
  - customer analysis services
  - mobility services

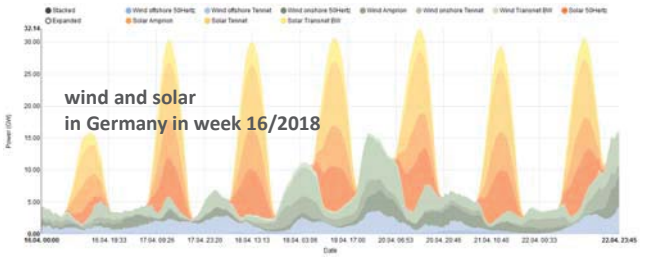


- business models based on smart meters are not feasible due to low willingness to pay
- weak profitability and legal framework are the main barriers
- cross-sectoral cooperations predominantly not an issue

Decarbonisation of the electricity&energy system
Challenge: Fluctuations



Source: Fraunhofer ISE/Energy Charts



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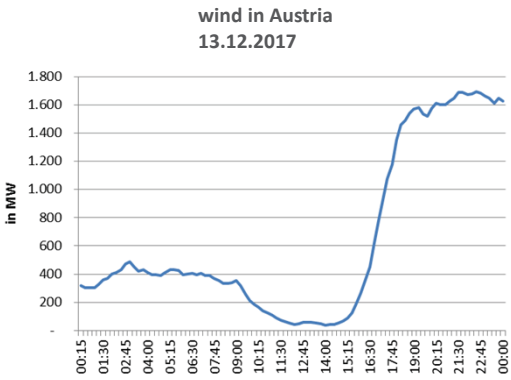
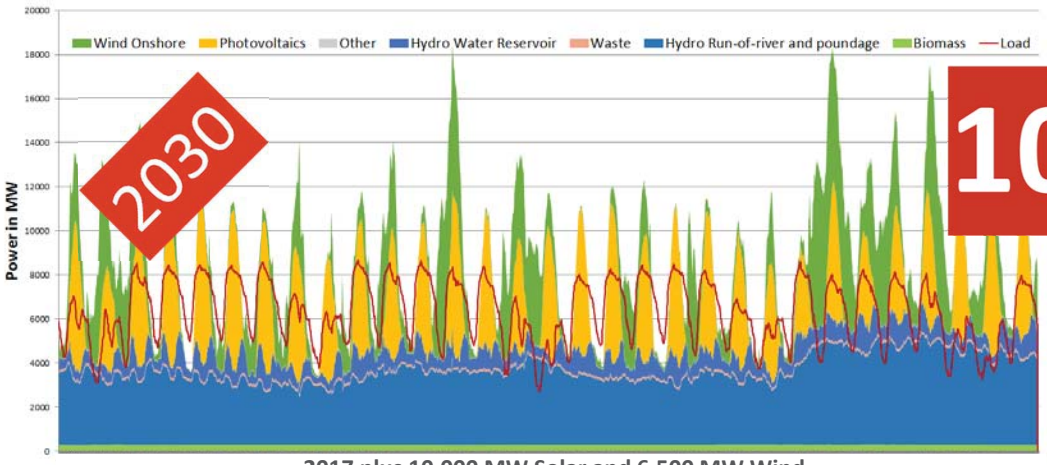


Source: Austrian Energy Agency
based on OeMAG data

Challenge: System integration
Massive surplus of power generation during summer ...



2017 plus 10.000 MW Solar and 6.500 MW Wind

July 2030

#mission2030

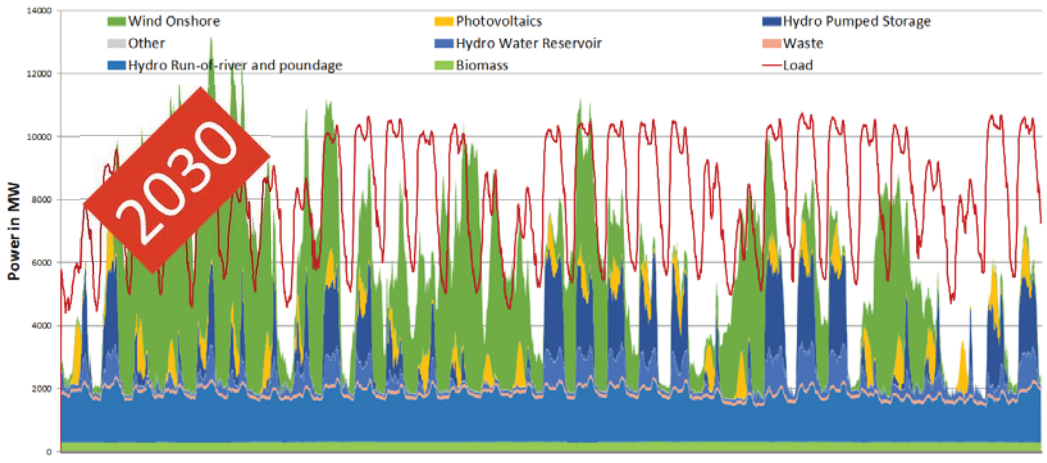
100%

until 2030

on annual national basis

Source: Austrian Energy Agency based on ENTSO-E data

… and substantial energy
needed to cover demand during winter

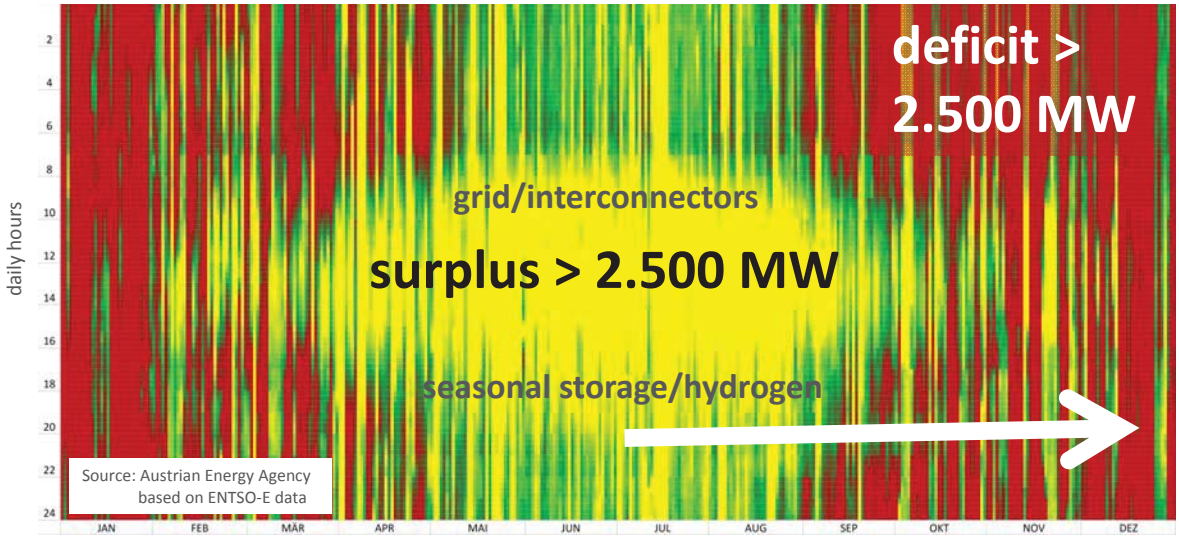


2017 plus 10.000 MW Solar and 6.500 MW Wind

January 2030

Source: Austrian Energy Agency based on ENTSO-E data

More flexiblility in demand and generation
Shifting power from summer to winter



Decarbonisation of the electricity&energy system

Challenge: plurality of participants

collective generation plants

prosumer

community storage

local/renewable energy communities

2008-2017:
60.000 PV installations
up to 5 kW
23.000 > 5 kW

"100.000 solar roofs and batteries" program
#mission2030

Source: pixabay

Source: Energie AG Oberösterreich

Source: *Kreisel Electric GmbH / www.martinproell.com*

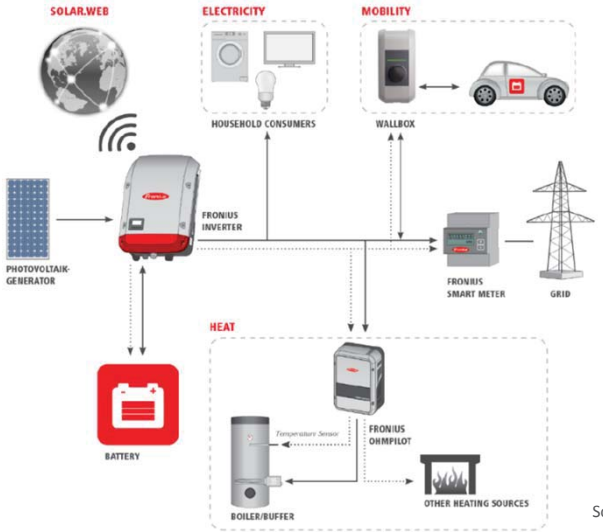
integration of e-cars & batteries

end of 2017:
400 wind parks

Wind potential
until 2030: 5.000 MW

Source: pixabay

Individual digital solution



Source: Fronius

next step:
integration of hydrogen

Local digital solution: Field test in the smart grids model community Köstendorf/Salzburg

AUSTRIAN ENERGY AGENCY

Monitoring Smart Meter
as „eyes in the grid"

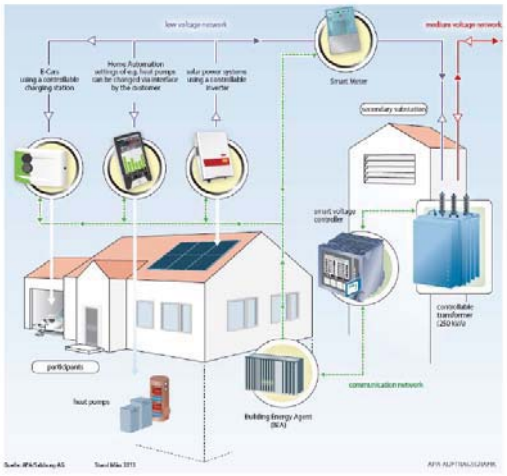
OLTC transformer
250 kVA, 5 taps

33 E-Cars with controllable charging stations
i-MieV:
0 – 8 – 12 – 16 Ampere

45 PV-systems (225 kWp) + 41 use a controllable solar inverter
active- and reactive-power control

5 "Home Storages"
4-5 kWh
(running "lead" project)

Building Energy Agent (BEA)
decentralised optimisation



Smart Low Voltage Grid Controller

Grid optimization by using the voltage data received from **smart meters**,

generating a grid status and sending optimized characteristics to the **smart grids actors** (e.g. solar inverter and charging station) via BEA

Orchestration of the system!

Source: Salzburg AG

Summary

- digitalisation is a prerequisite for decarbonisation of energy systems
- in the future it provides security of supply with
  - mainly fluctuating generation
  - high and diverse number of participants („prosumer styles")
  - need to integrate/operate demand sectors and supply
- smart meters are an essential tool
- but several concerns
  - data/cyber security
  - health problems
  - to keep up with state of the art
  - usefulness for business models/compatibility with market design
- **ENERGY INTELLIGENCE is essential for ENERGY FUTURE**

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