



Office franco-allemand pour la transition énergétique
Deutsch-französisches Büro für die Energiewende

28.02.2017 | Berlin
Französische Botschaft in Berlin

Panel 1:

Welche Bedeutung wird die Sektorkopplung im zukünftigen Energiesystem einnehmen und welchen Herausforderungen muss sie sich stellen?

Quelle rôle aura l'intégration sectorielle et à quels défis devra-t-elle faire face dans le système énergétique futur ?



@DFB_EW #Sektorkopplung
@OFA_TE #smart #energysystem

Soutenu par : /
Gefördert durch:



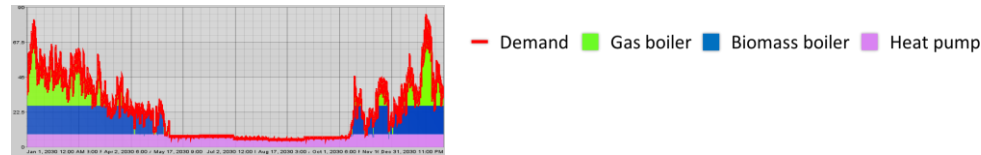
on the basis of a decision
by the German Bundestag

Soutenu par : /
Gefördert durch:



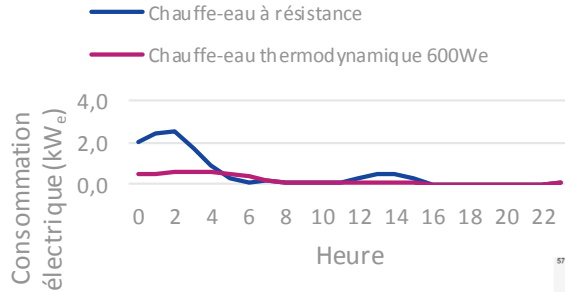
4 Reducing CO2 emissions for heating can be achieved efficiently using **heat pumps**, with some limitations...

- | Heat pumps can be **economically profitable** under high renewable integration targets (50% RES for district heating)
- | **Liquid-to-water or geothermal heat pumps are more efficient** than atmospheric HPs, but have **lower deployment potential**
- | Current heat pump technology is **limited to low temperature heat** (<150 °C)
- | Heat pumps can **complement or compete with biomass heat boilers**
- | Due to high CAPEX, heat pumps are used for **base production mostly**



- | Using heat pumps for domestic tank water heaters (instead of resistance tank water heaters) should not impact flexibility of smart grids significantly

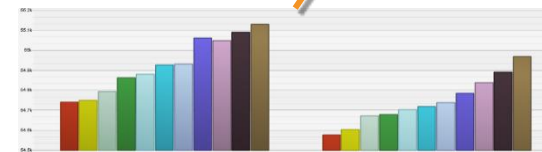
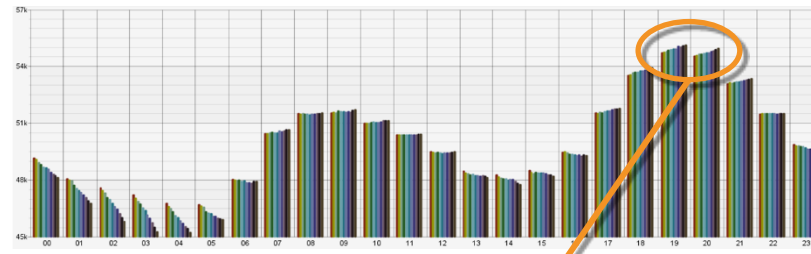
↳ *“Study of the potential of thermal energy storage and power-to-heat technologies”, 2016, Artelys & ENEA Consulting*



Daily profile, assuming intelligent load planning

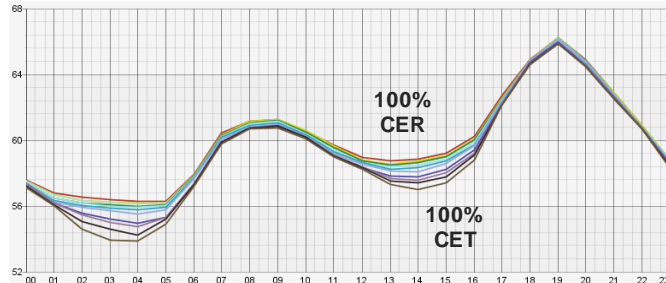
- High power, peaking profile for resistance tank water heaters
- Low power, base profile for water heaters with heat pumps

Impact on demand



0% de CET → 100% de CET

Impact on price




Sektorkopplung für die Energiewende

>>

DBFEW/ OFATE

Berlin, den 28.02.2017

Eva Hauser

 In order to attain a resilient energy system transformation, the heat and mobility sector both need an adapted infrastructure and should make the best use of a variety of existing energy resources.

It seems unlikely that this can be achieved in considering the mobility and heat sector as „sinks“ for future „excess electricity“.

Vielen Dank für Ihre Aufmerksamkeit!

Eva Hauser

IZES gGmbH
Altenkessler Str. 17, Geb. A1
D-66115 Saarbrücken

hauser@izes.de

Solutions to variability/predictability of wind and solar

- Problems at different **temporal** and **spatial** scales
- A **compromise** between solutions is required,
- Multiple solutions/problems are not shared by the same actor. How to reach optimum in a liberalized system ?

- Conversion to gas (very high volumes, possible. Lots of usages : transport, heat, micro-cogen, elec, possibility to use the existing network. Difference H2/CH4. high CAPEX, very low efficiency)
- DSM (difficult to evaluate the potential and the cost. Seems economically interesting),
- Storage (PHES, micro-PHES, chemical, ... different scales and maturity)
- Curtailment (easy to implement, often the first solution, no capex)
- Network reinforcement : LV/HV – AC/DC (Complicated computations...)
- Power to heat (increase renewable heat integration, efficiency of systems)
- ...