

# **ENERGY FOR THE HEAT MARKET IN AUSTRIA**

## **THE IGNORED ASPECTS OF POWER AND STORAGE**

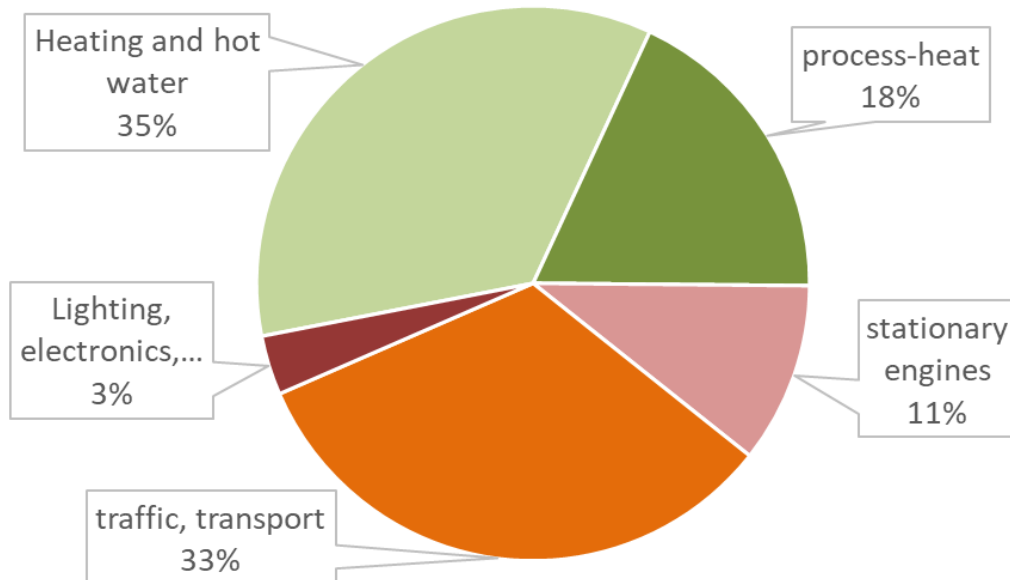
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## Energy –Supply is not a Pie

Energy-services: 50% is used for heat

Final Energy: Ca. 22% Electricity

Energy-services Austria 2022 (1,065 PJ/a)



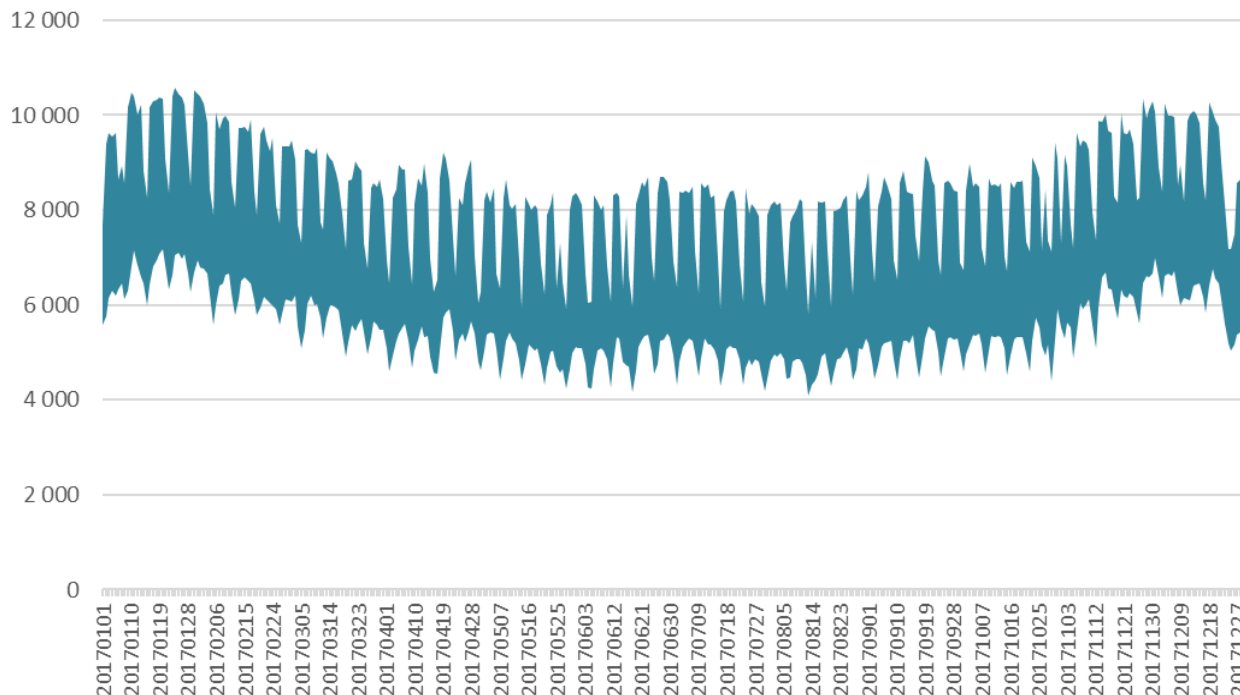
» Usually, energy demand (of a region, a country, the world) is presented in pie-charts

» This presentation provides an average-demand of a year, insinuating a smooth demand-curve

**However, a more realistic picture is provided by  
the time-variation-curve (here: electricity)**

$$\text{Energy} = \text{Power} * \text{Time} \quad (\text{kWh} = \text{kW} * \text{h})$$

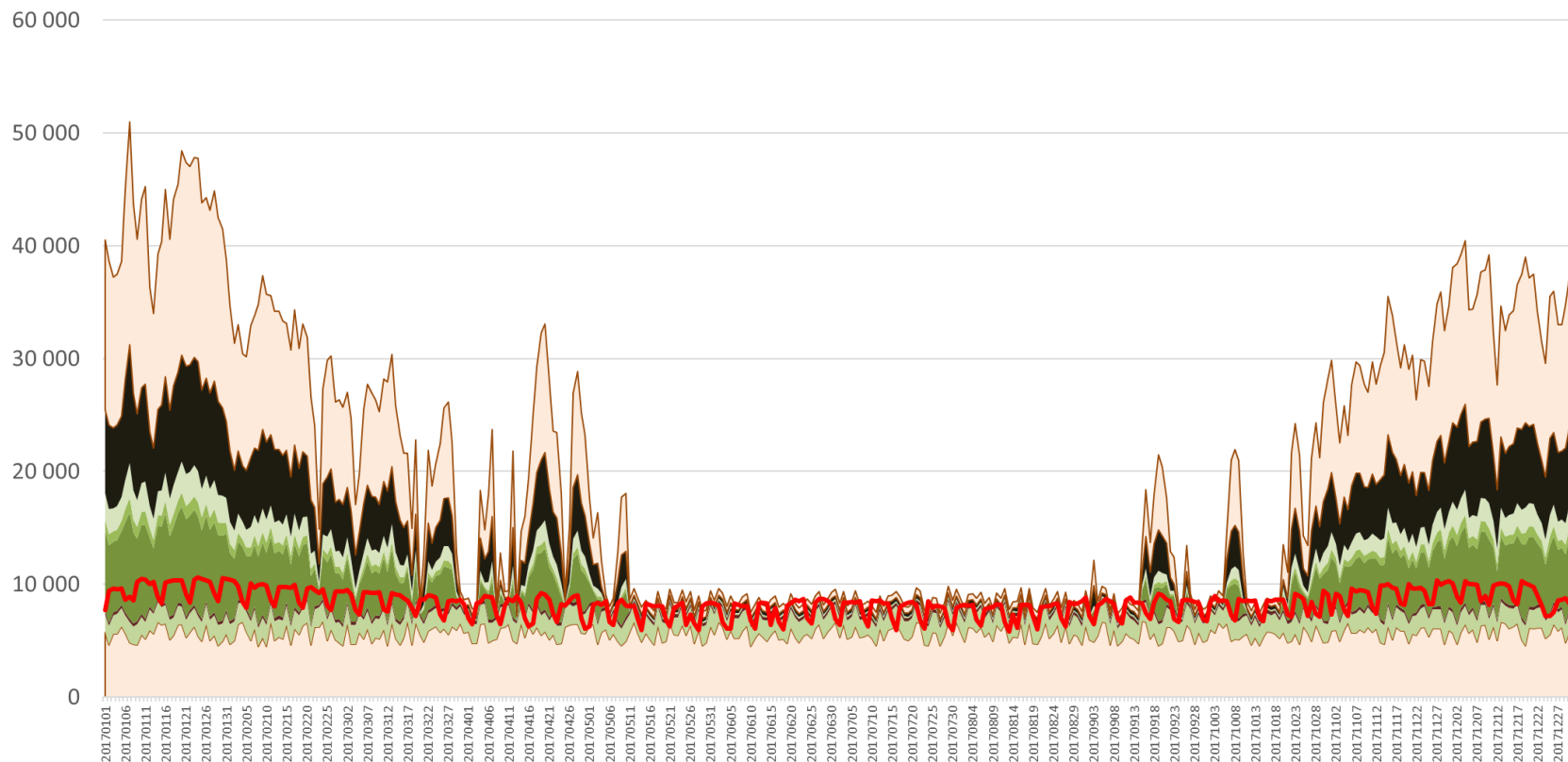
Daily peak - and lowest load in the electric grid  
(MW, Austria Jan 1st to Dec 31st, 2017)



- » The electricity-grid provided ca. 10,600 MW maximum power
- » Highest power-demand occurs in coldest periode of the year
- » Lowest load was ca. 4,000 MW in August
- » Highest daily spread: 4,200 MW

# Time-variation-curve of heat demand

## Natural gas, oil- & bioenergy in Austrian heat-markets, electric peak-load per day (MW, 2017)



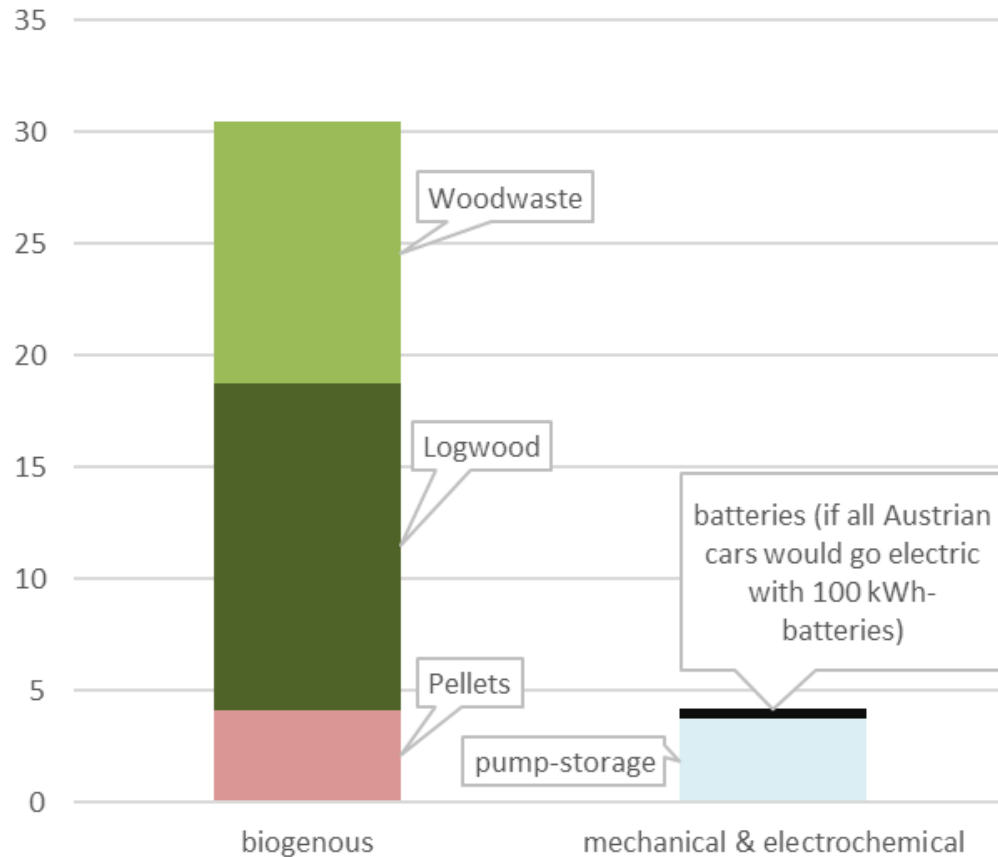
nat. gas for process heat and steam  
 logwood  
 oil for heating, hot water  
 biogenous fuels for industry, steam  
 biogenous fuels for heating, hot water  
 pellets, briquettes  
 Nat. gas for heating and hot water  
 oil for industry, steam  
 electric peak load (per day)

10.6 GW  
50.1 GW

Max power demand electricity:  
Max power demand heat:

## Storing energy: pellets in 200,000 homes, batteries, pump-storage,...

Energy-storage technologies in Austria  
(TWh)



## Conclusions (1)

- » Electricity = energy, but not all energy is electricity!
- » Energy-demand is not a smooth curve over time
- » Its ups and downs follow varying demands of industry, households,...
- » The main trigger of low-temperature heat demand follows the pattern of heating-degree-days

## Conclusions (2)

- » Power-demand for heat outnumbers the power provided by the electric grid by a factor of 5 (Austria)
- » Bottleneck-capacity of the electric grid will not be able to supply the heat-demand
  - Heat-pumps would have low COP in times of low temperature. Their application would only minutely lower heat-power demand in cold periods
- » **Biomass as storable renewable energy-carrier which can supply high power during short time-periodes is deeply needed**

Thank you for your interest!

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