

ENERGY FOR THE HEAT MARKET IN AUSTRIA

THE IGNORED ASPECTS OF POWER AND STORAGE

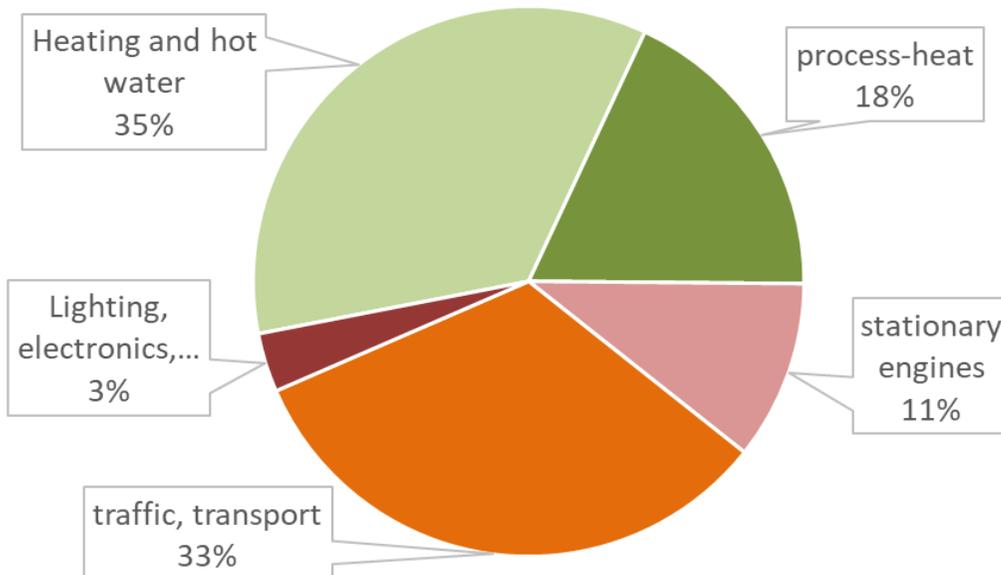
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Energy –Supply is not a Pie

Energy-services: 50% is used for heat

Final Energy: Ca. 22% Electricity

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



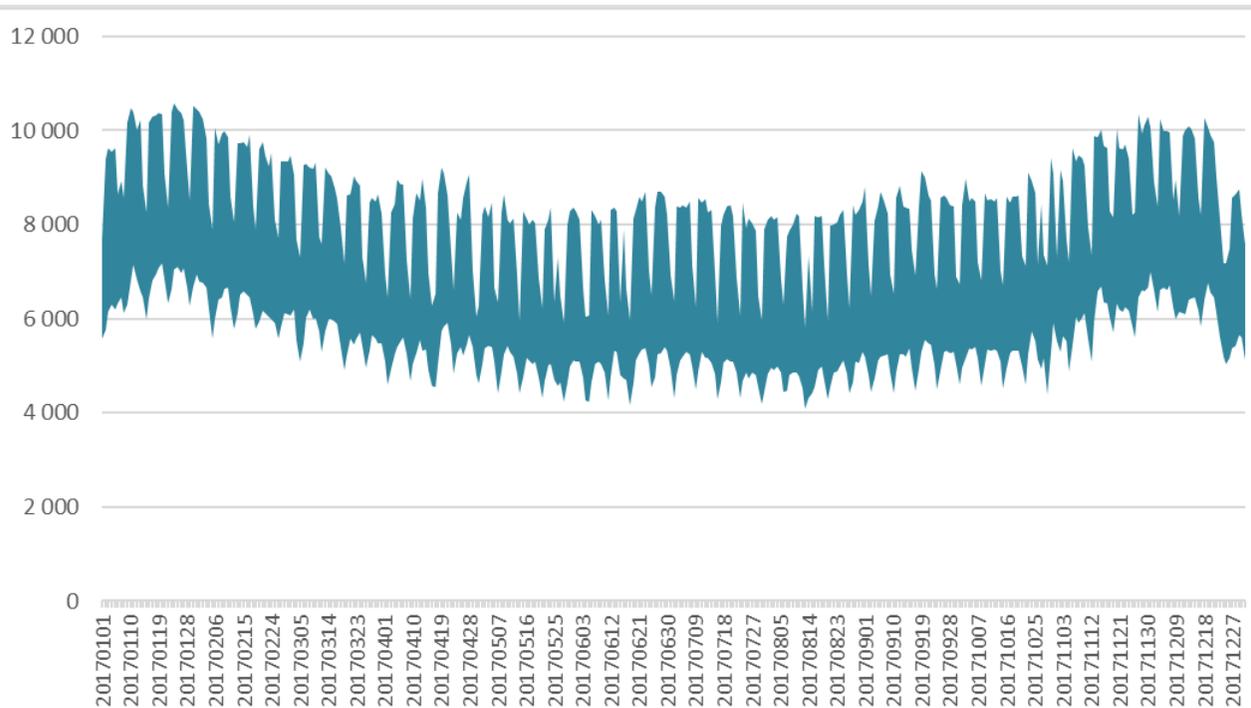
» Usually, energy demand (of a region, a country, the world) is presented in pie-charts

» 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)**

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

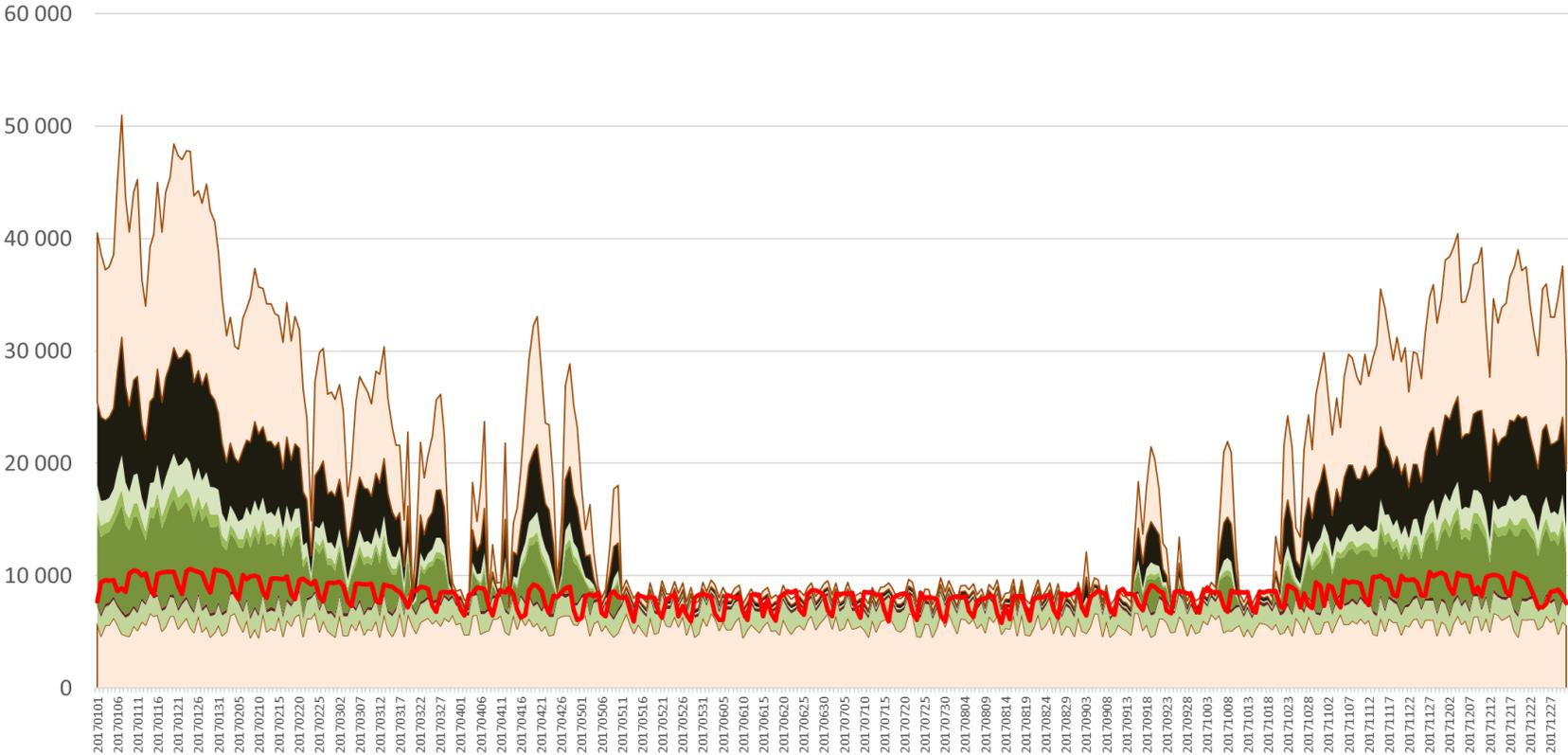
Daily peak - and lowest load in the electric grid
(MW, Austria Jan 1st to Dec 31st, 2017)



- » 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)



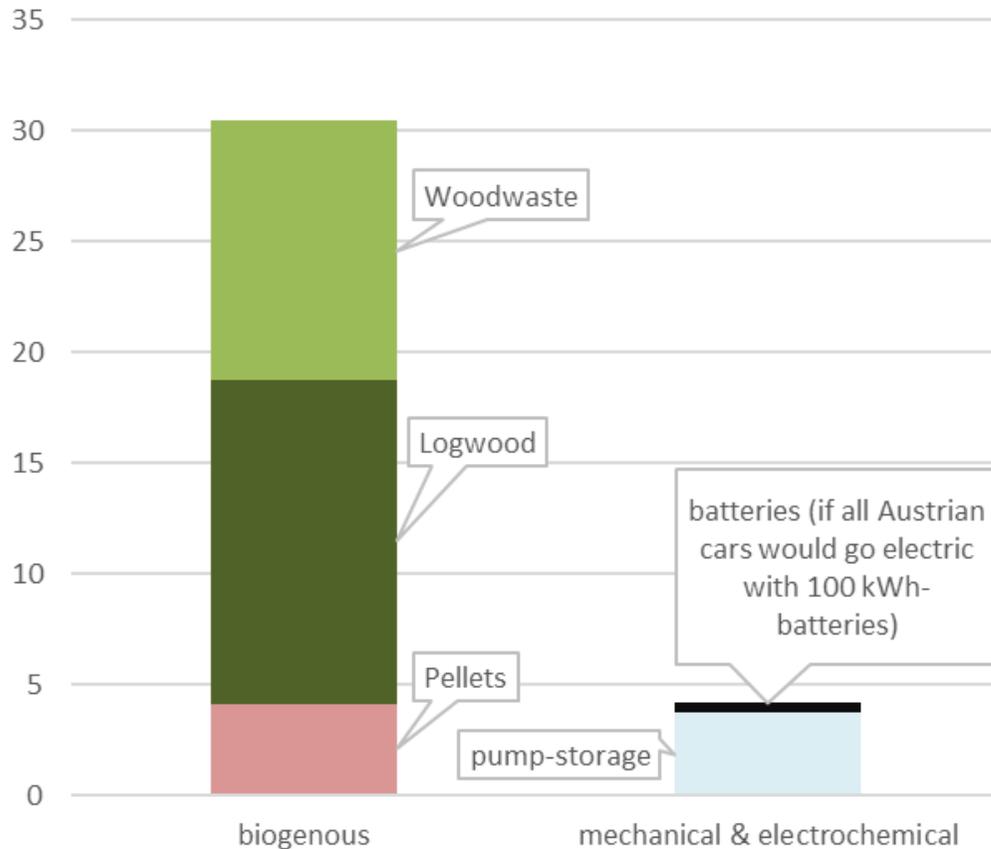
- nat. gas for process heat and steam
- biogenous fuels for industry, steam
- oil for industry, steam
- logwood
- biogenous fuels for heating, hot water
- pellets, briquettes
- oil for heating, hot water
- Nat. gas for heating and hot water
- electric peak load (per day)

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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