



NVE

EVs IN NORWAY

Impact on the grid, and how to deal with it

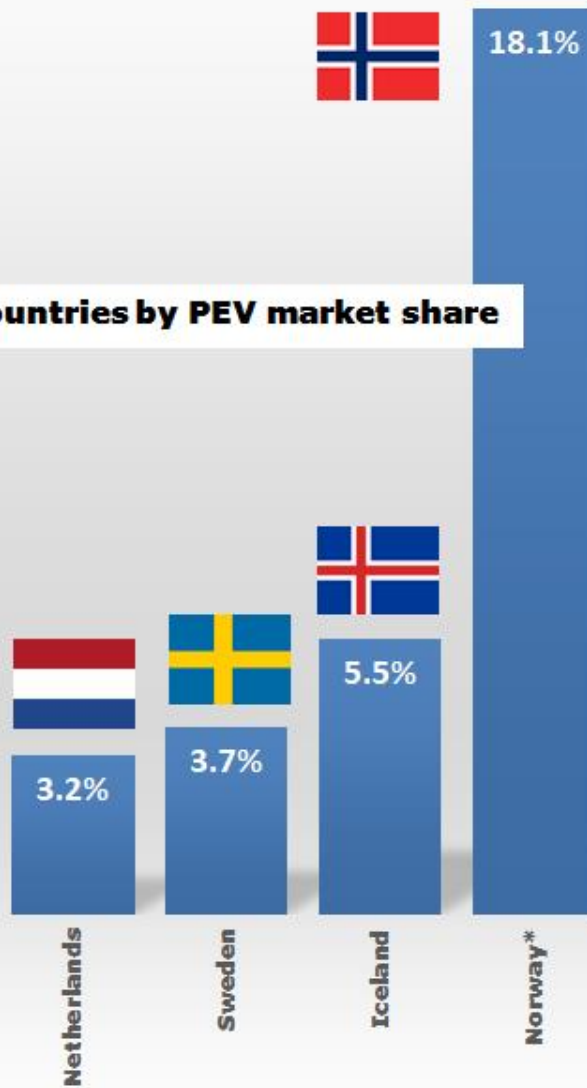
Christer Skotland

The Norwegian Water Resources and Energy Directorate

Plug-in electric cars in use as a proportion of all passenger cars on the road in selected countries and regional markets (Dec 2020)

Percentage of plug-in passenger cars in use

Top countries by PEV market share



Top markets by PEV sales volume



Notes: * PEVs in use as of March 2021

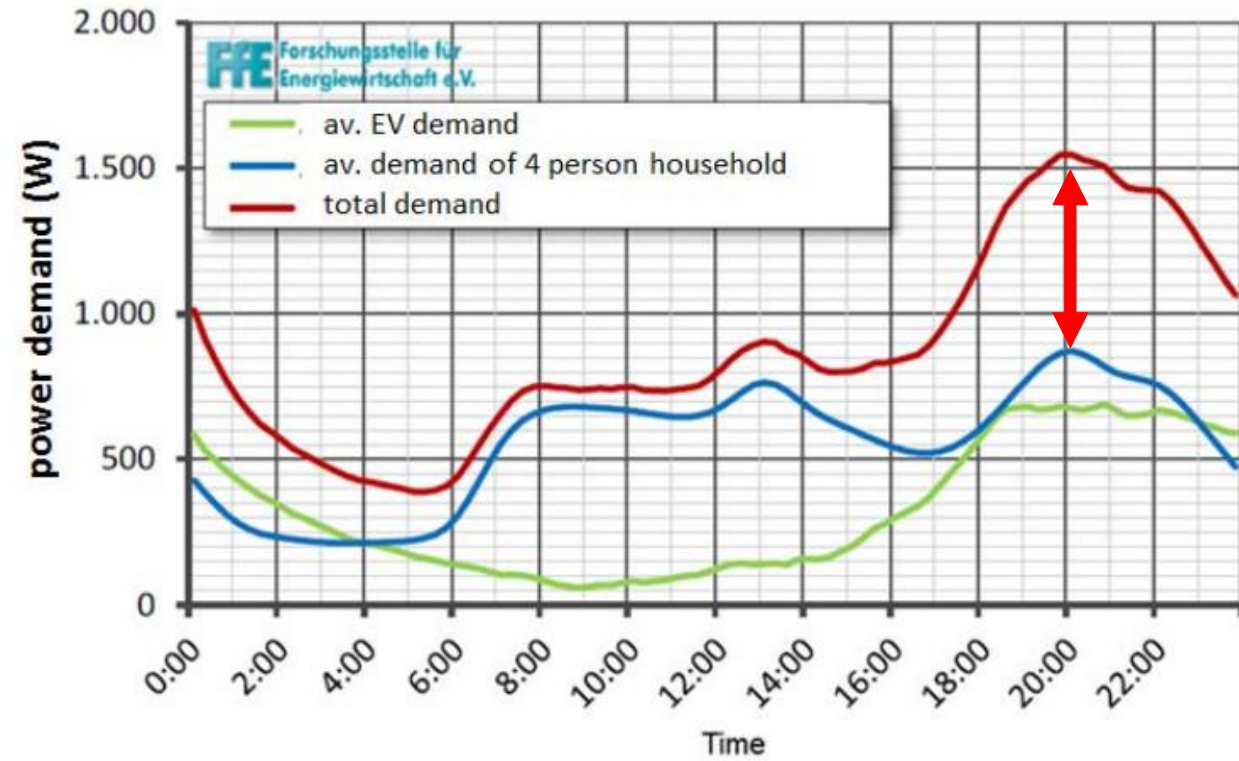


What are the consequences on the Norwegian grid?



Household demand and EV-charging

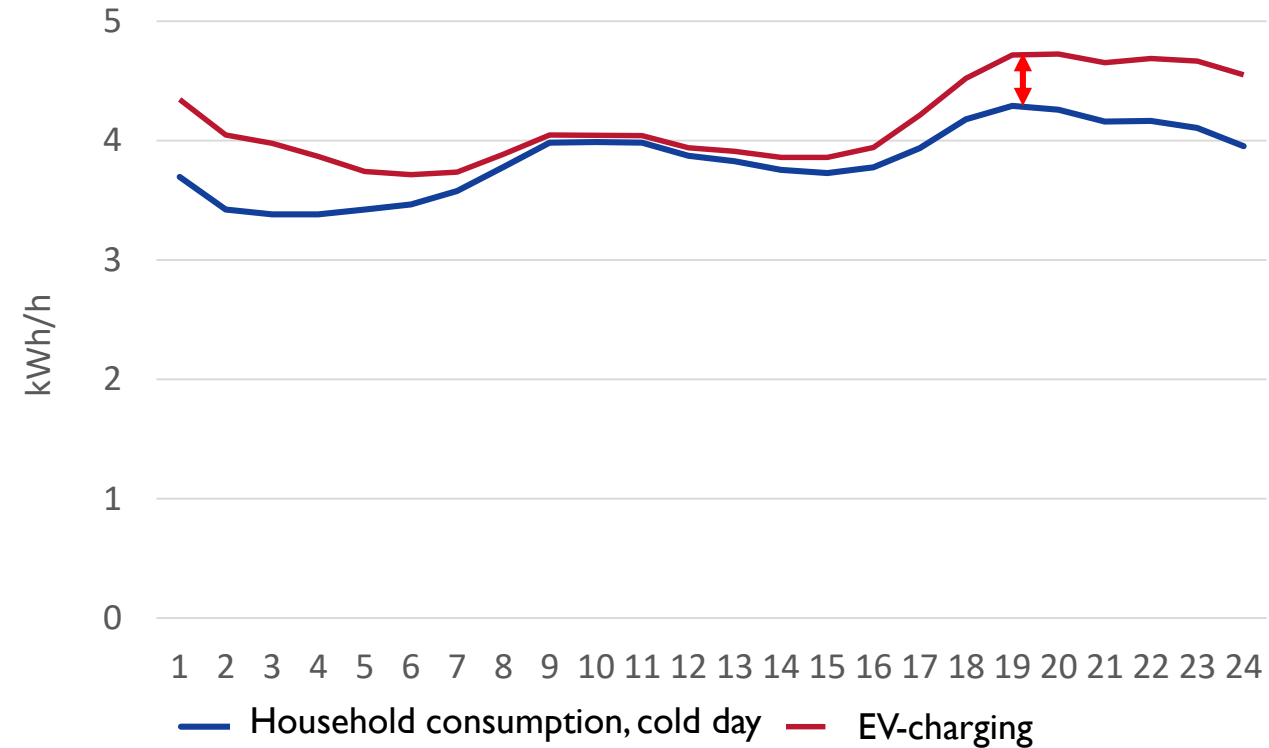
Germany



source: <https://www.oeko.de/fileadmin/oekodoc/Assessing-the-status-of-electrification-of-the-road-transport-passenger-vehicles.pdf>

For charging profiles, see: <https://www.sciencedirect.com/science/article/pii/S0378778821002073?via%3Dihub>

Norway



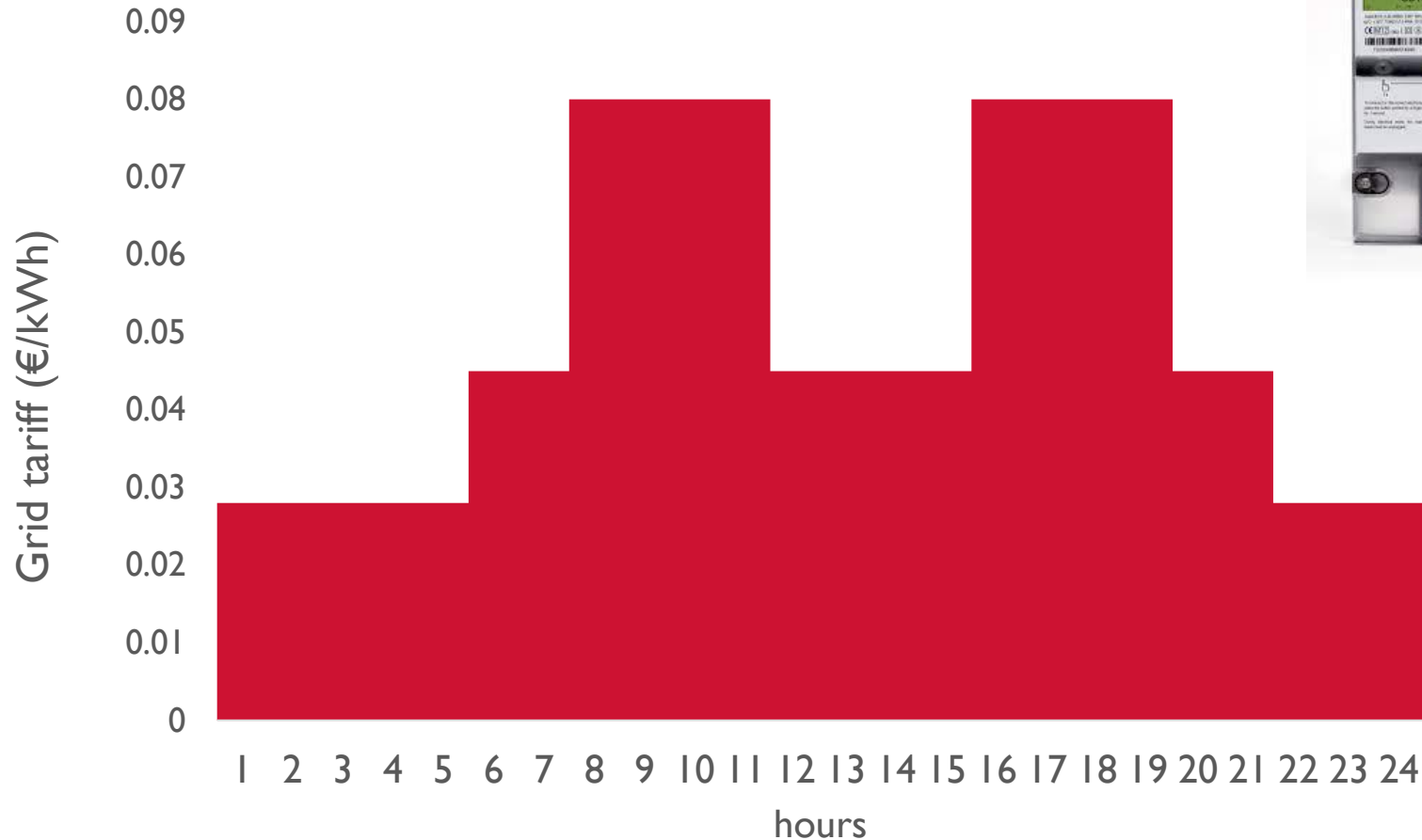
Source: http://publikasjoner.nve.no/rapport/2016/rapport2016_74.pdf



Three incentives to reduce the grid costs

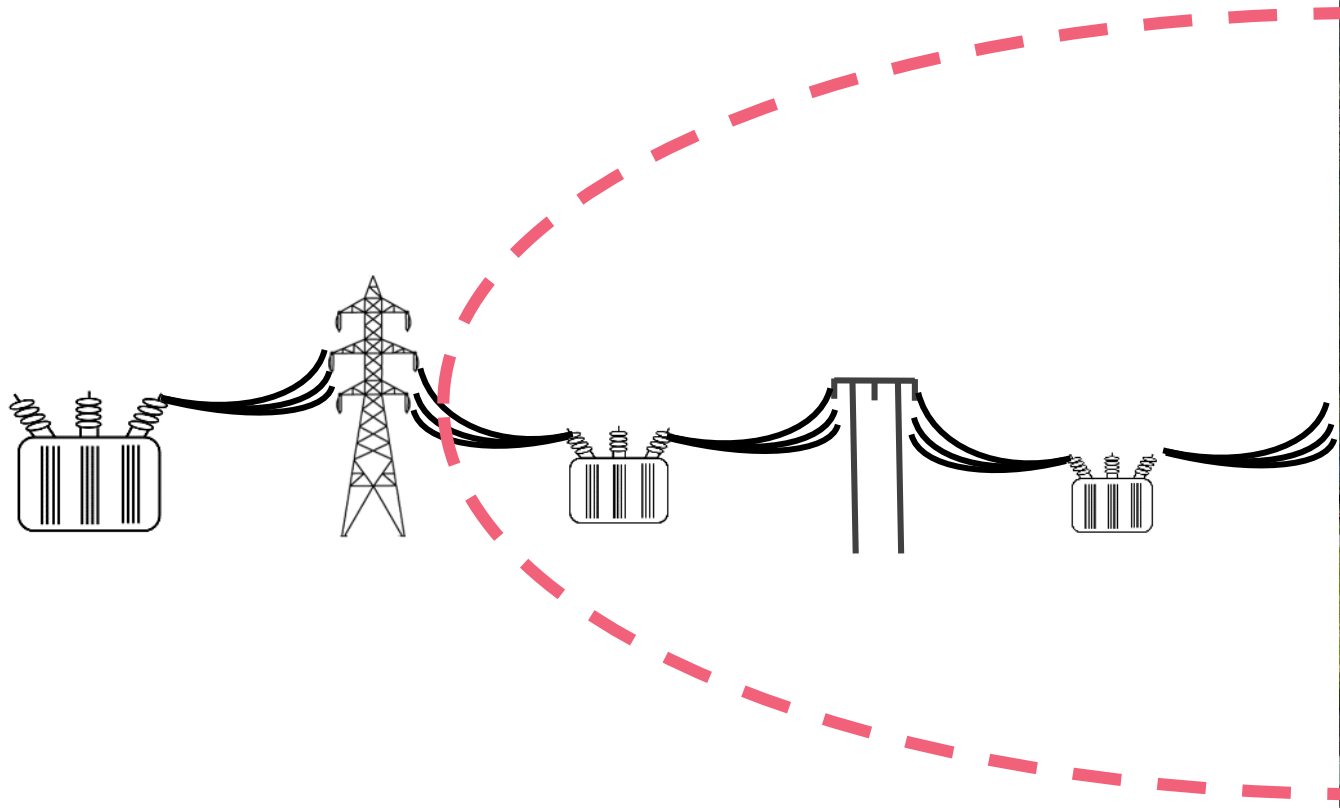
1. New capacity based grid tariffs (ongoing process since 2015...)
2. Connection fee
3. Non-firm connection

Example model for a new grid tariff (use tariff and a capacity cost)



Capacity (kWh/h)	€/month
0-2 kW	10
2-5 kW	15
5-10 kW	22
10-15 kW	30
15-20 kW	38
20-25 kW	45

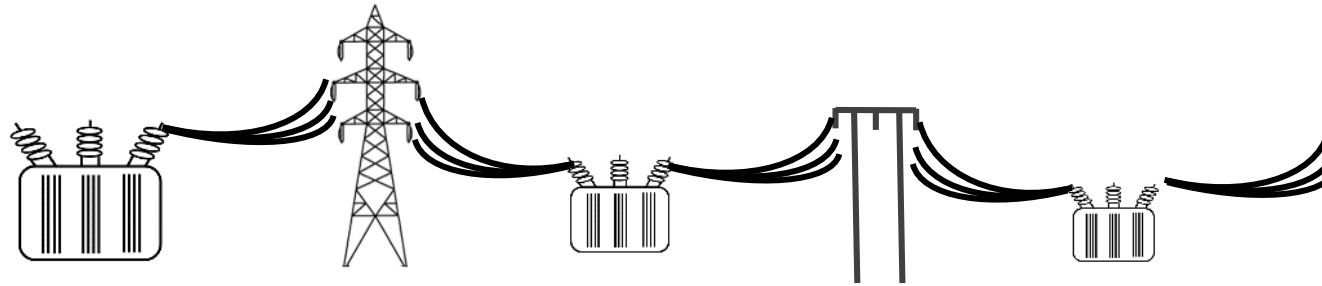
Connection fee



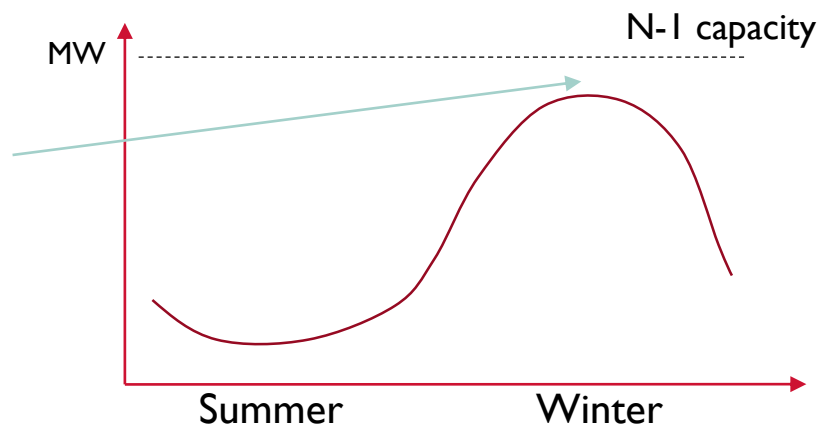
The user has to pay the cost of the grid, if there is not sufficient capacity

Non-firm connection

- Enables the grid companies to curtail consumption on terms that are agreed upon
- Makes it possible to connect customers faster and postpone or avoid grid investments



Point where curtailment could occur





Thank you!

