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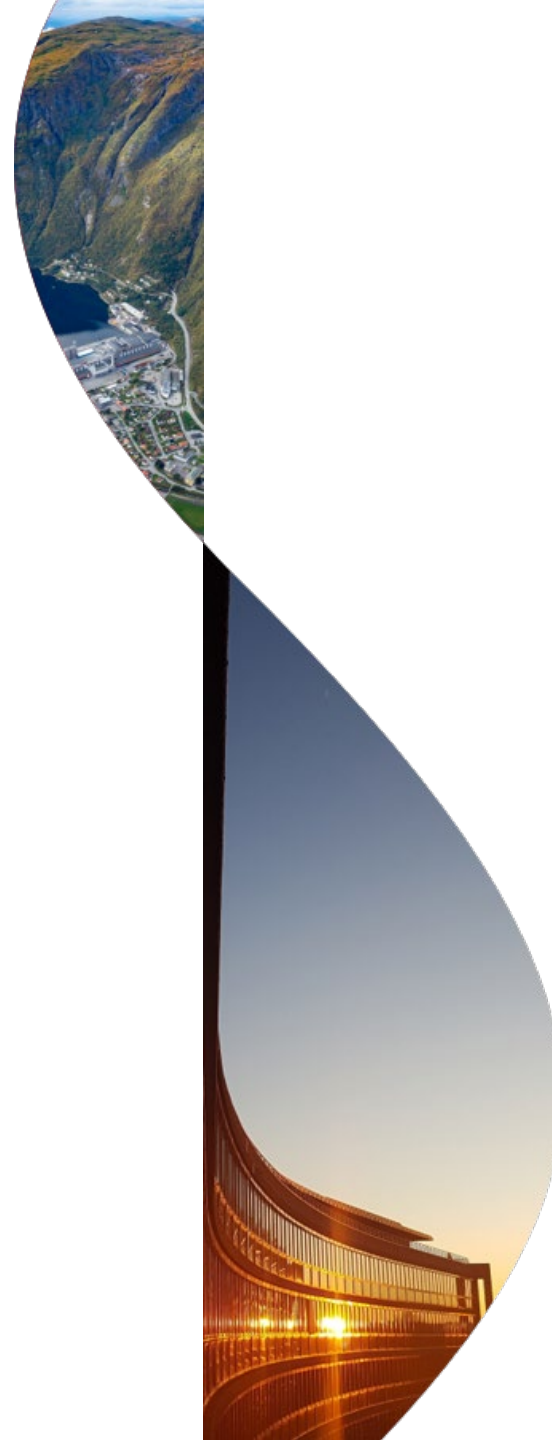
The Norwegian Energy
Regulatory Authority – RME

DISTRIBUTION TARIFFS AND CONSUMER FLEXIBILITY



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NVE-RME





The Norwegian Energy Regulatory Authority

Socioeconomic
development

Environmentally sound
energy system

Efficient and reliable
transmission, distribution,
trade and use



Agenda

Theory

- **Network tariffs and the electricity market**
- Theoretical basis for tariffs
- Principles for tariff design
- Consumer flexibility

Consumer flexibility examples

- Tariffs for consumption – the new tariff structure
- Non-firm connections
- Tariffs for flexible consumption

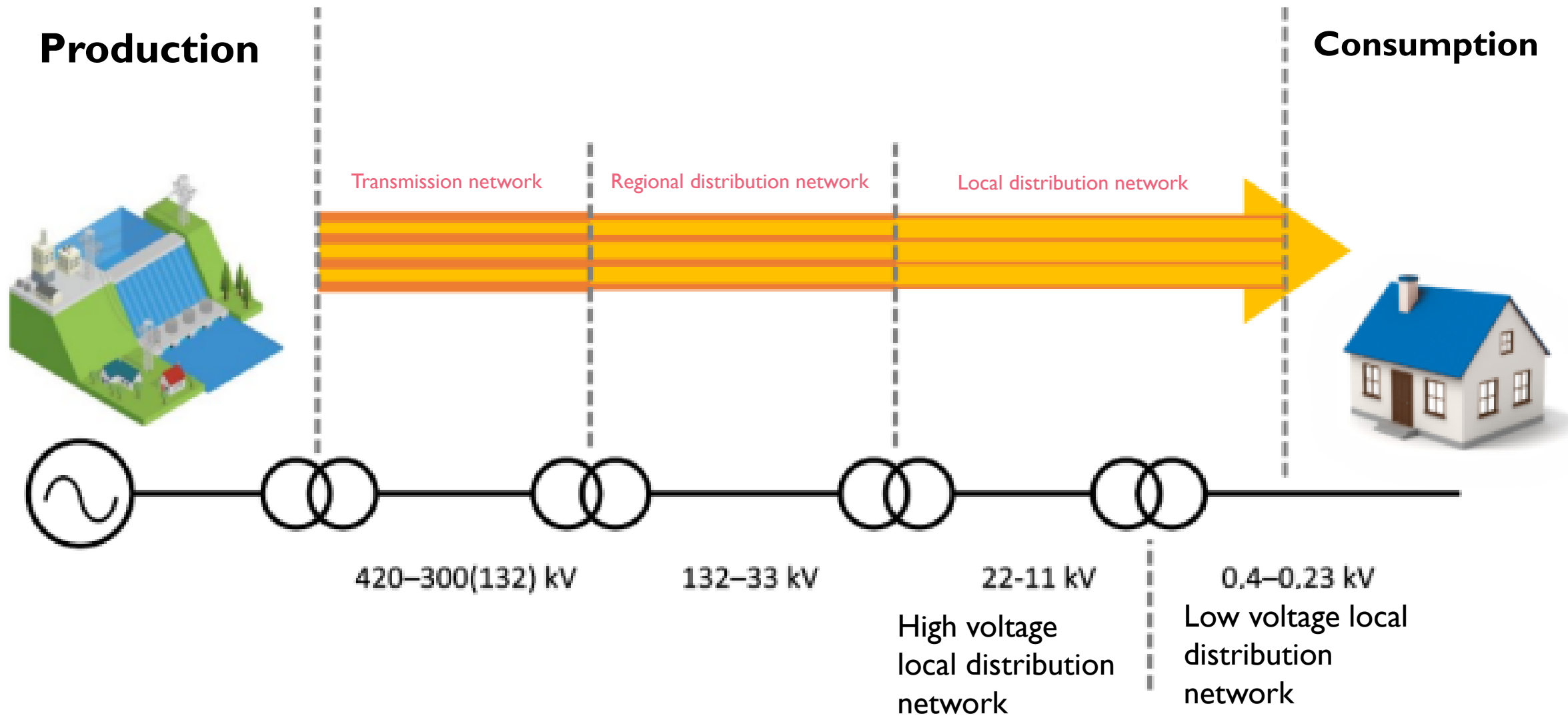


Network tariffs for consumption

- Price components paid by electricity consumers to finance the past costs of building and operating the electricity grid



The electrical network





Agenda

Theory

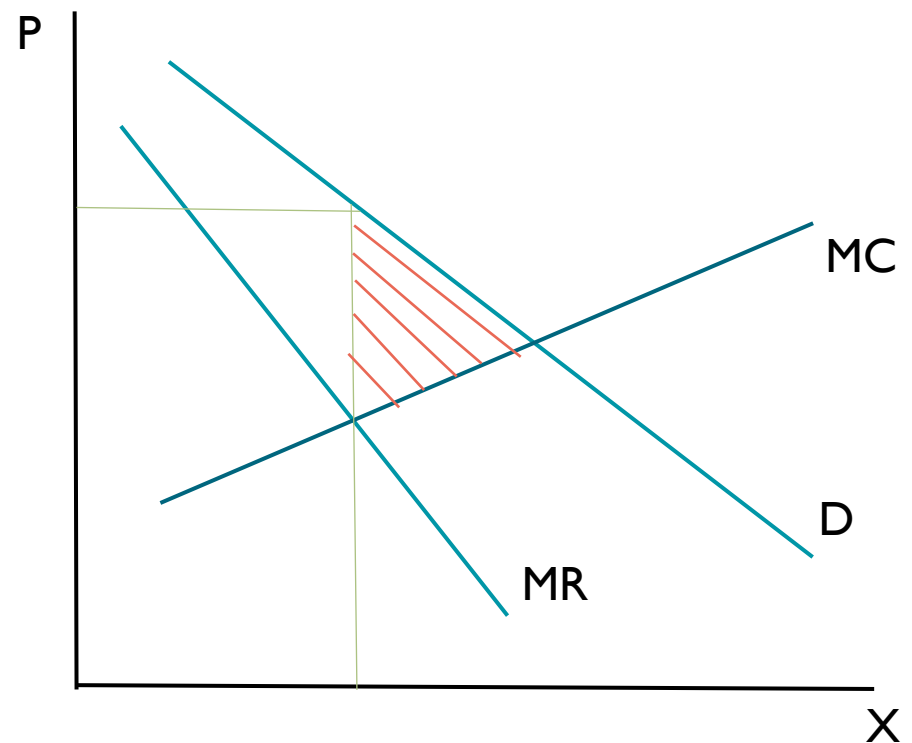
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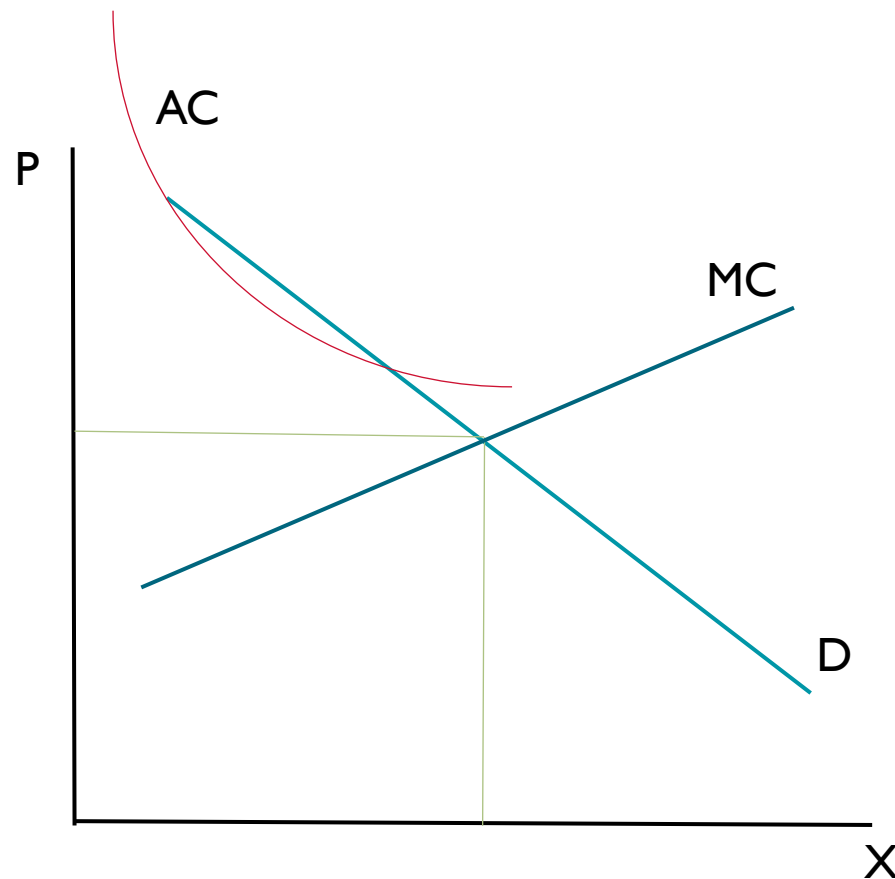
Theoretical basis for network tariffs

- Natural monopoly
- Regulated
- Inefficient



Theoretical basis for network tariffs

- $P = \text{Marginal loss}$
- Not sufficient
- Fixed component





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Principles for tariff design

Cost recovery

Cost reflectivity

Non-discriminatory and objective

Transparency

Predictability and simplicity



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Consumer flexibility examples

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Consumer flexibility

What is consumer flexibility?

- Energy system flexibility is the ability to adjust supply and demand to achieve energy balance
- Why do we need flexibility?

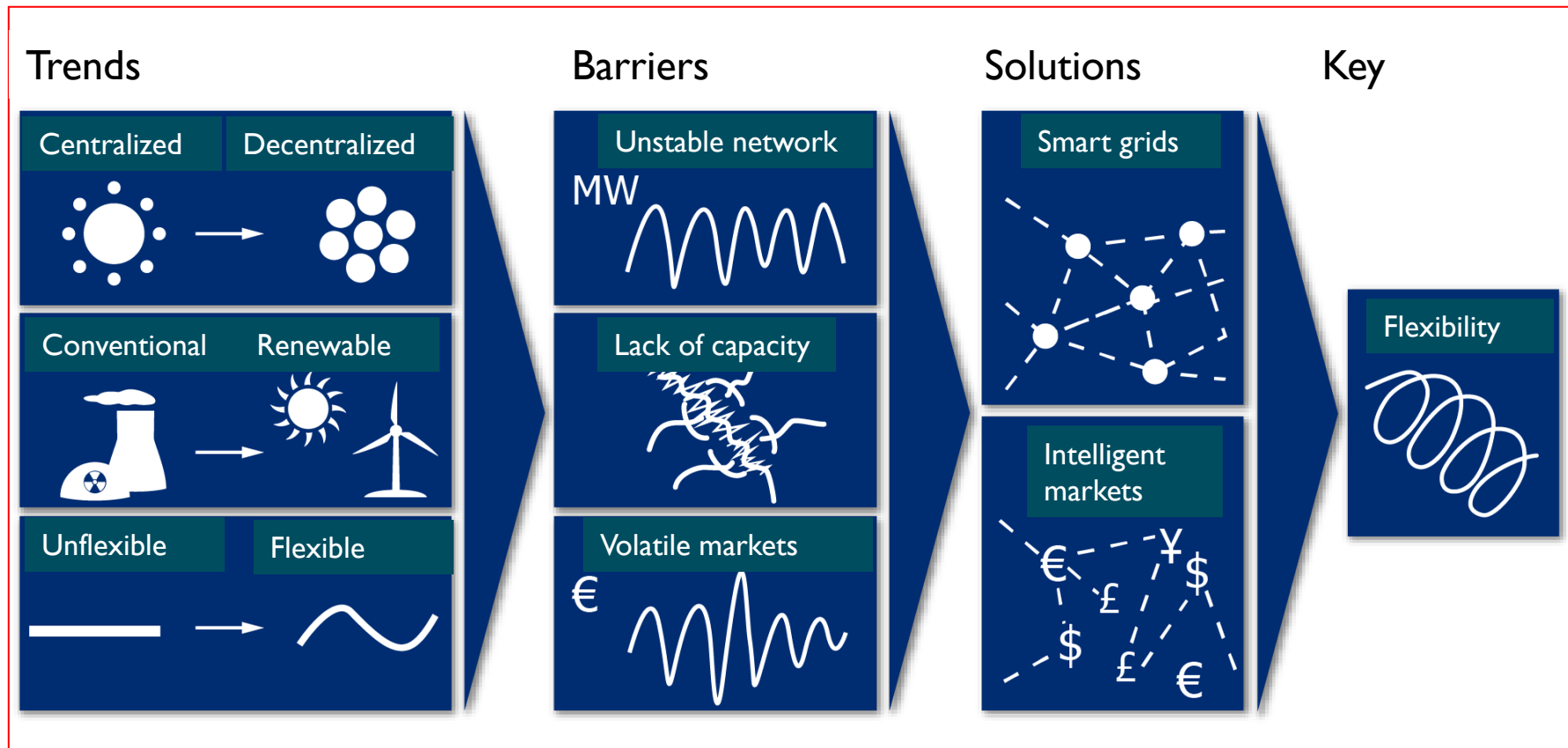
Different types of consumer flexibility

- Explicit flexibility
- Implicit flexibility

Examples of implicit consumer flexibility

- Dynamic price contract
- Dynamic network tariffs

Why do we need flexibility?





Consumer flexibility

What is consumer flexibility?

- Flexible electricity consumption are changes in the consumption as a reaction to price signals
- Why do we need consumer flexibility?

Different types of consumer flexibility

- Explicit flexibility
- Implicit flexibility

Examples of implicit consumer flexibility

- Dynamic price contract
- Dynamic network tariffs



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Former network tariffs in the local distribution grid

Fixed component:

- Customer-specific costs
- A share of the other fixed costs

Variable component:

- Marginal losses in the grid
- A share of the fixed costs

Power component (optional):

- Based on demand for capacity in defined periods

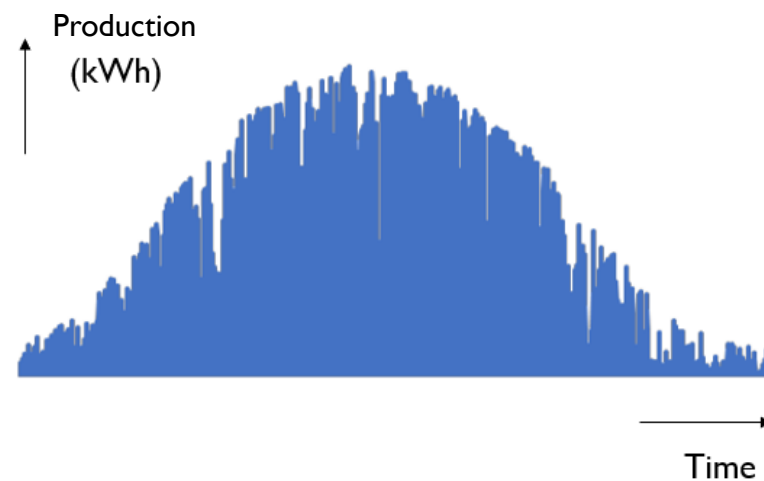
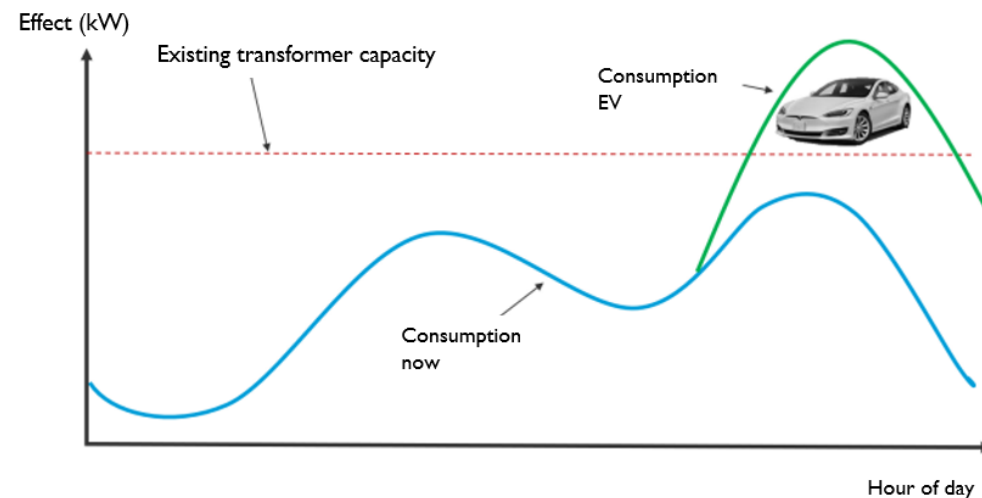
BKK Nett network tariffs for households (until 30.6.2022)

Fixed component	239,5 NOK/month
Variable component	43 øre/kWh

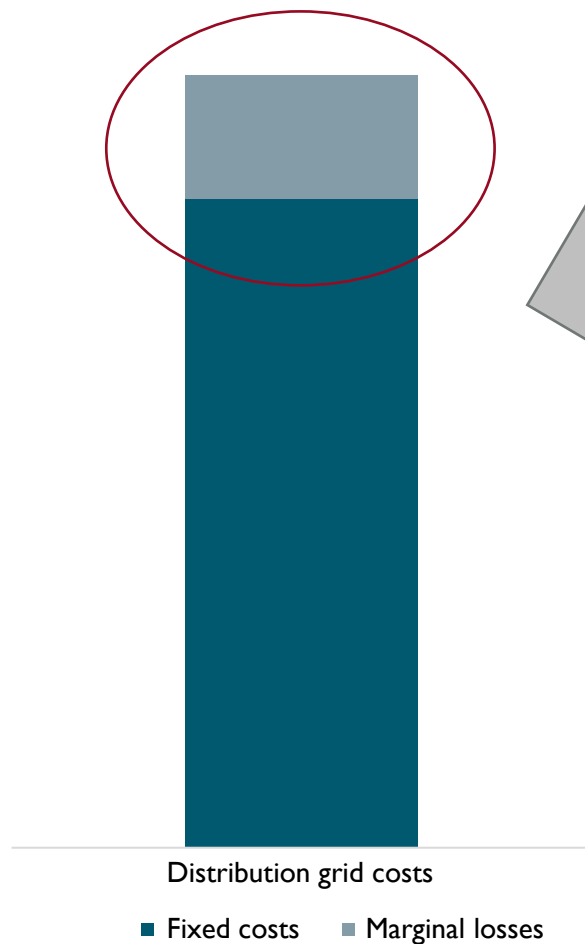


Network tariffs should be cost reflective

- Changes in electricity consumption
 - Higher investments -> Higher tariffs
- Electrification of transport sector
 - 50-100% increase in demand for capacity
- Rapid increase in prosumers
 - Higher tariffs for other customers.



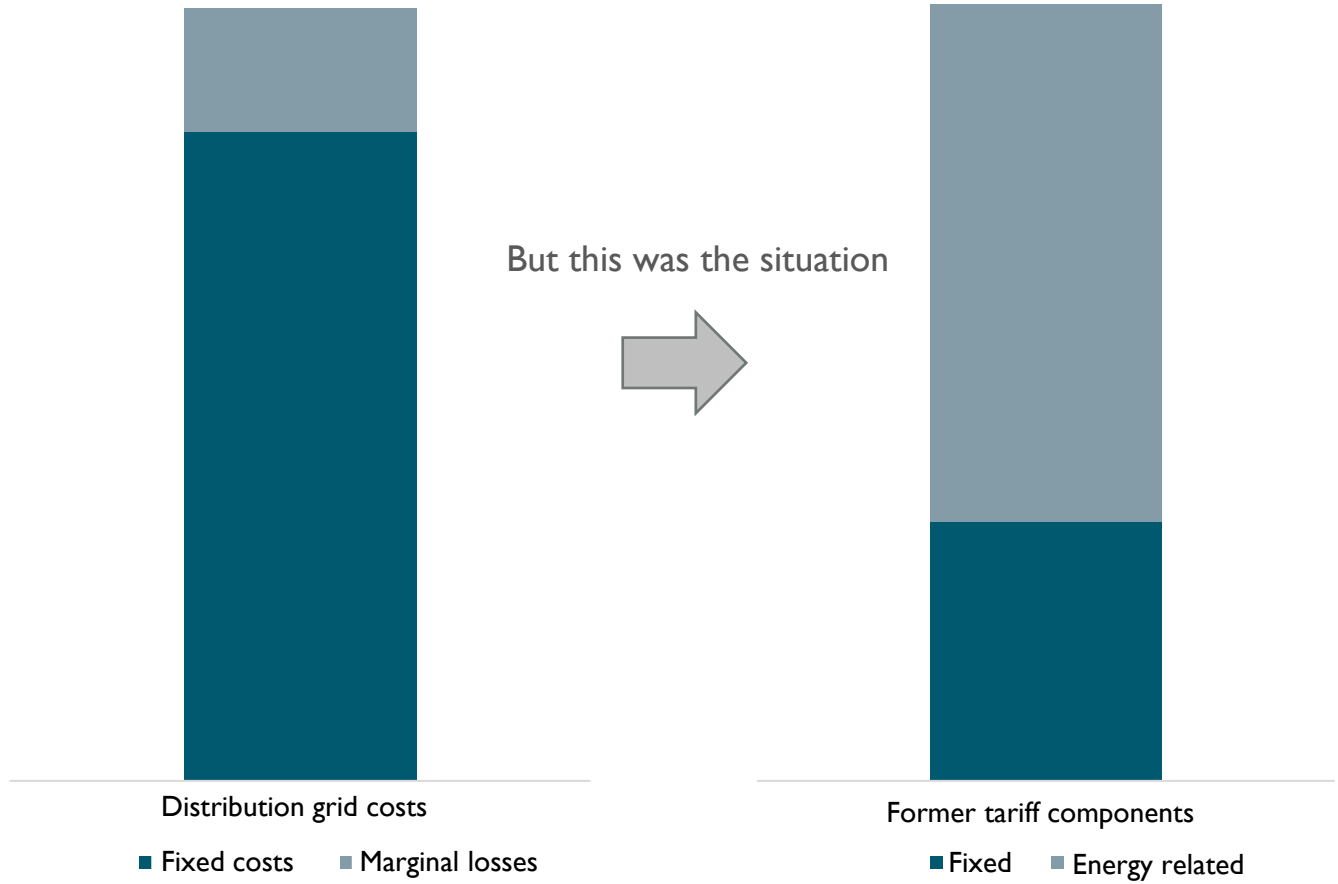
Grid costs equal the cost of marginal losses (10%) and fixed costs (90%)



- DSOs that set the price equal to their marginal costs are only recovering 10% of their total costs
- This should also be reflected in the price customers pay

Network tariffs should be cost reflective

- The customers in the distribution grid covered 1/3 of the costs through a fixed component and 2/3 through an energy component
- This creates erroneous incentives in regard to customer investments and adaptations
- Capacity-based tariff structure



Network tariffs – consumption in the local distribution grid

Fixed component:

- Customer-specific costs
- A share of the other fixed costs in the network
- Differentiated based on the customers' demand for capacity

Variable component:

- Marginal losses in the network
- A share of the fixed costs in the network
- May contain a markup during peak hours
- A cap of max. 50% of the total income from each customer group. Allowed to collect more than 50% until 1. July 2024

Power component:

- Based on demand for capacity in defined periods
- For larger business customers (> 100 000 kWh)





Examples of the new tariff structure

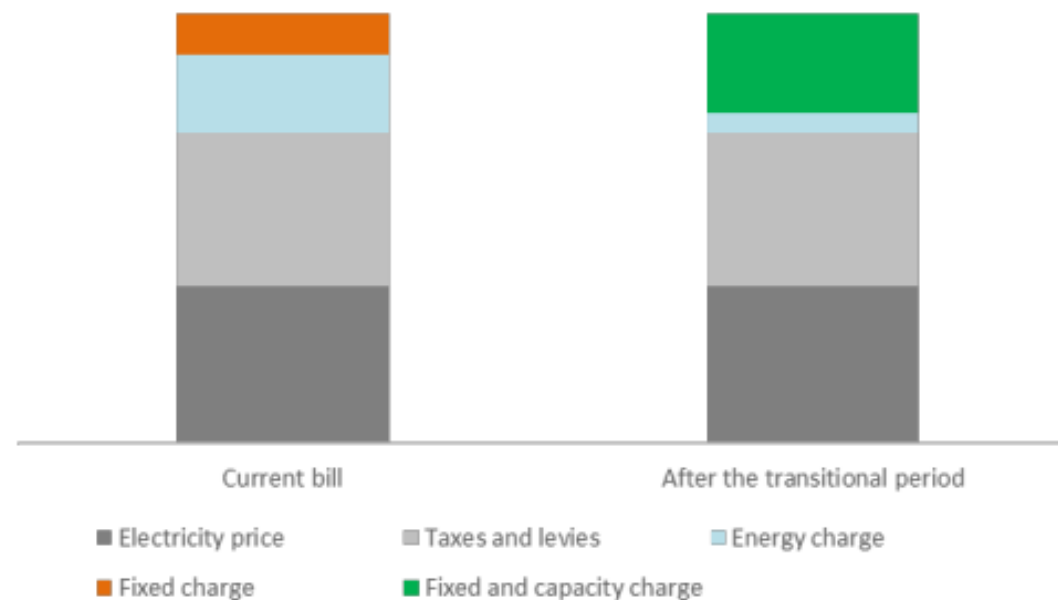
- Fixed component based on measured capacity
- Based on the average three hours with the highest demand for capacity
- Example from BKK Nett

Fixed component	Daily Max kWh per hour	NOK/Month
Step 1	0-2	125
Step 2	2-5	206
Step 3	5-10	350
Step 4	10-15	494
Step 5	15-20	638

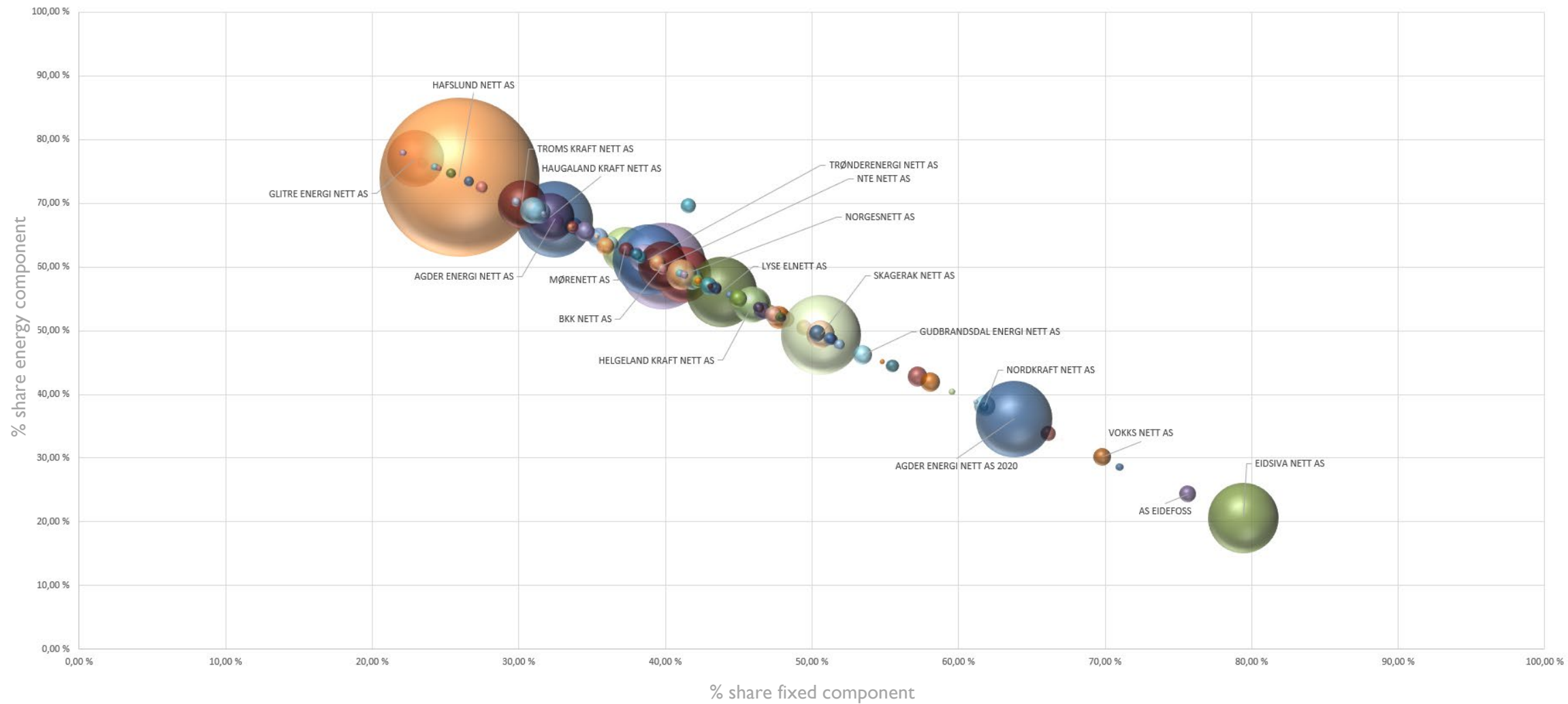
Variable component	Day	Night/Weekend
Price - øre/kWh	49,9	39,9

Cost reflective tariffs

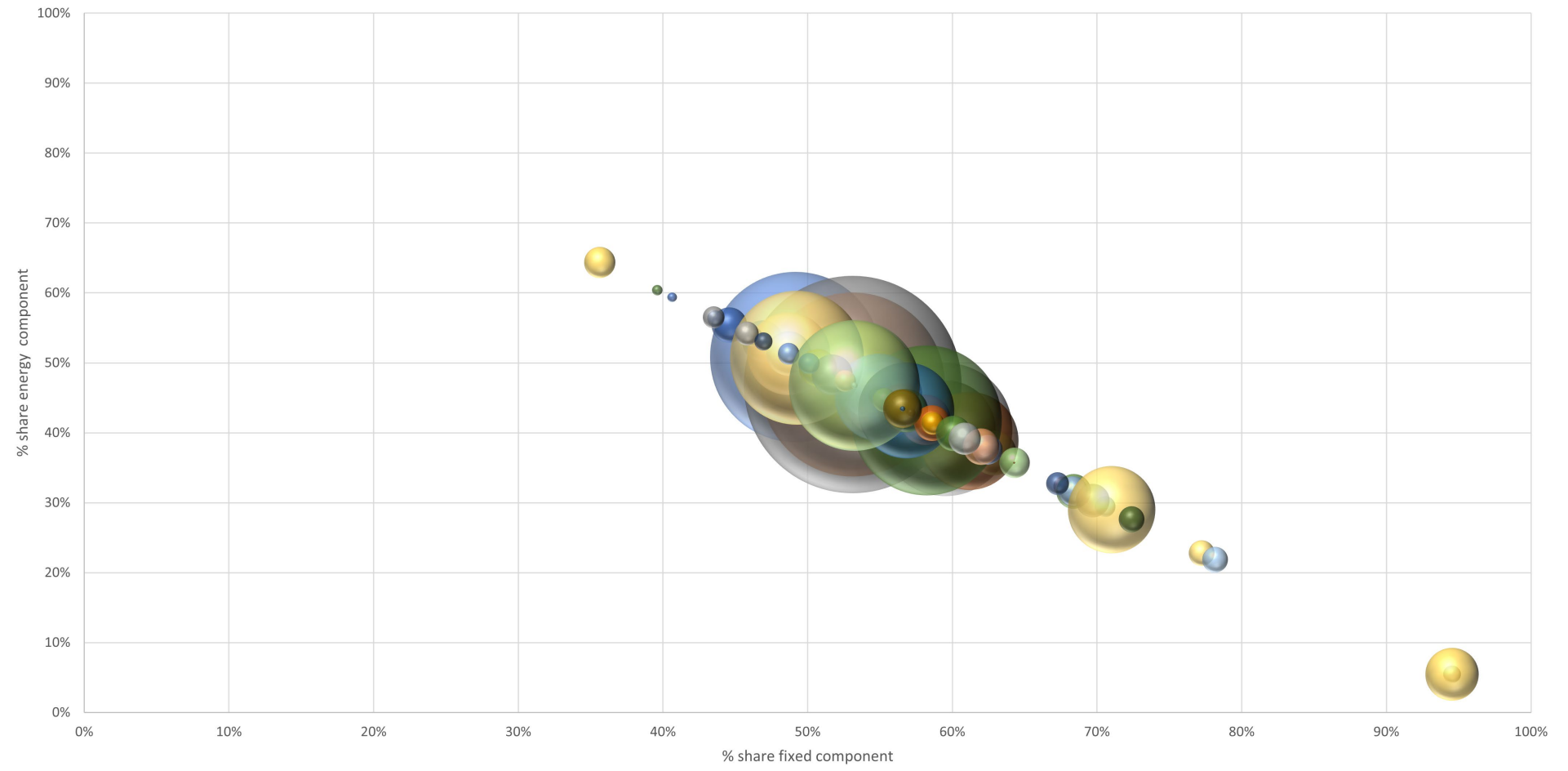
- Network tariffs constituted one third of the electricity bill
- Affect the division of cost elements



Distribution between the fixed and energy component in the tariff for different DSOs



Distribution between fixed- and energy component in tariff for households



Consequences of the new structure

Cost reflective tariffs

- The components of the tariffs

Incentives for flexibility

- Rewards consumers who reduce demand for capacity
- Consumer knowledge and ability to adapt



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- **Non-firm connections**
- Tariffs for flexible consumption



Non-firm connections

What are non-firm connections?

DSOs required to offer all customers a network connection

Available capacity most of the time



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Tariffs for flexible consumption

- Tariff reduction customers may be offered by the DSO for letting them temporarily disconnect them from the grid
- Example from BKK Nett

Discount scheme	Power component reduction
Instant disconnection, unlimited disconnection time	50 %
Instant disconnection, maximum 14 days disconnection time per year	40 %
Instant disconnection, maximum 4 hours disconnection time per day	25 %



Example from Agder Energi Nett

Notification before disconnection	Power component reduction
Instant disconnection	65 %
15 minutes	45 %
2 hours	35 %
12 hours	25 %



Summary

Tariffs may contribute to facilitating flexibility in the network

Flexibility can contribute to delaying or even avoiding unnecessary investment in the network

Contributes to a more efficient use of the network



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THANK YOU FOR YOUR ATTENTION



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