



# Norwegian Water Resources and Energy Directorate

An overview of the Norwegian regulation -  
and tariff system

by

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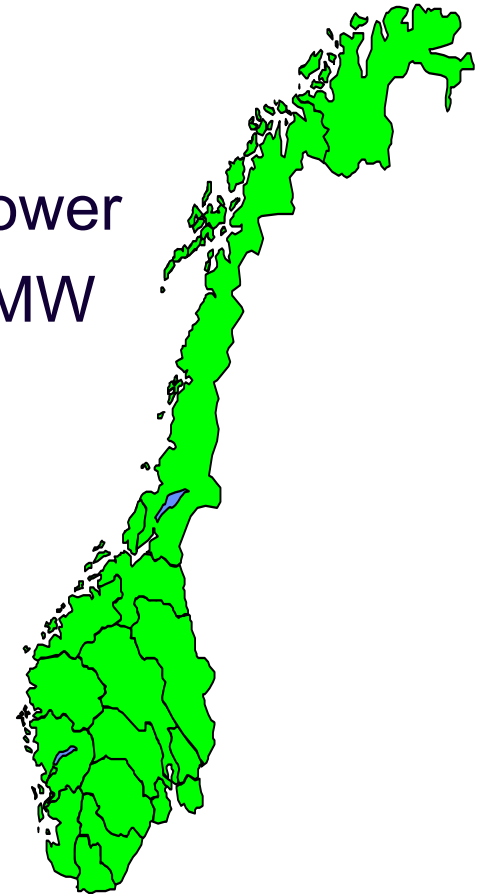
# Organization of the electricity market in Norway

- The Ministry of Petroleum and Energy is the highest authority.
- NVE is a directorate directly under the ministry of Petroleum and Energy
- NVE is the regulating authority and issues regulations, licenses and monitors the energy market and the monopoly operations of the network companies.



# Background Norway

- Population: 4,2 mill.people
- Norwegian Production - 99% Hydro-power
- 600 power stations - capacity 27 500 MW
- 235 network companies - public ownership dominant
- Many utilities are vertically integrated
- Only 20% of production is private
- Unbundling of supply and transmission since 1991





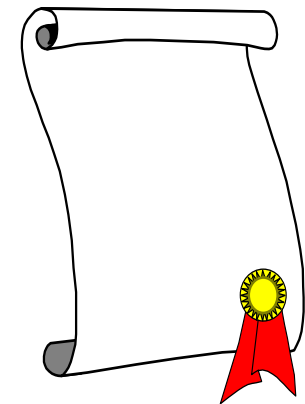
# The Norwegian Electricity Market

- All customers have access to a competitive market (new energy act in 1990)
- NVE regulate the monopoly – the network
- A common point (entry/exit) system is established
- Transmission tariffs are completely independent of trading agreements



# The legal framework in the Norwegian regulatory system

- Energy act (1990)
  - unbundling of supply and transmission/distribution
  
- Regulations - level 1
  - Ministry of Petroleum and Energy
  
- Regulations - level 2
  - NVE - the Regulator
    - [www.nve.no/english/energy/regulations](http://www.nve.no/english/energy/regulations)





# Income Cap Regulation

- Every year NVE sets maximum permitted income for all networks
- The concessionaire is obligated to do technical and economic reporting to NVE each year
- Maximum and minimum rate of return
- Regulating period of five years (2002-2006)
- Annual updates (inflation, efficiency, value of losses, increase in energy demand nationally and new connections)

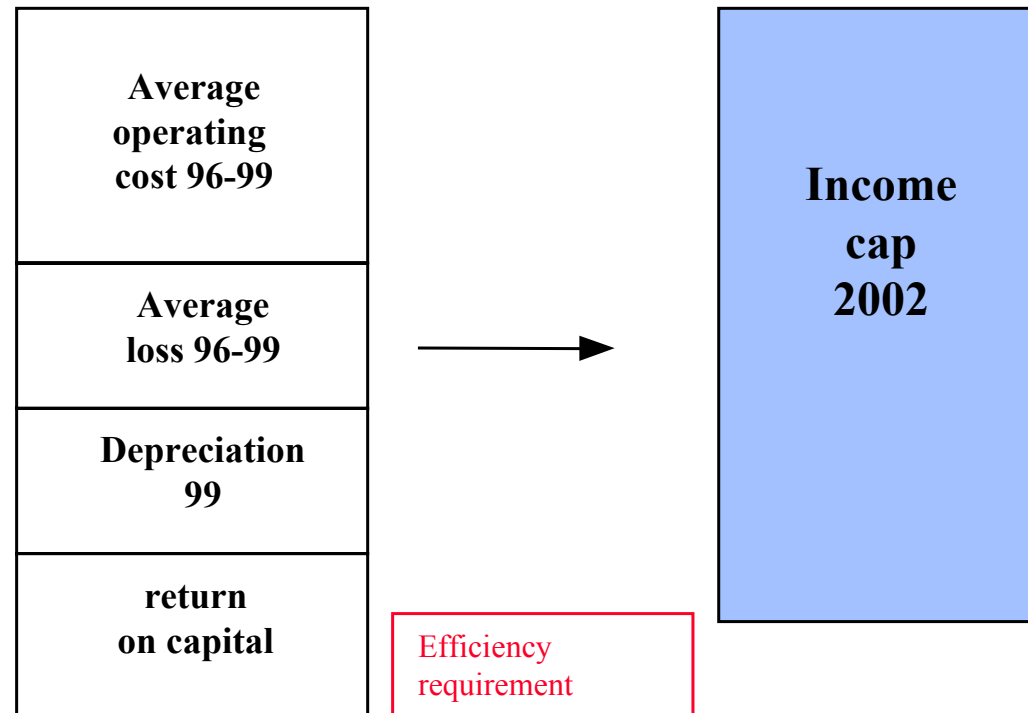


# Incentive regulation

## *Income cap & Annual Accounts*

The income cap

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# Handling excess/deficit income (windfall gain/losses)

- If a network company has higher income one year than the income cap, Regulations state that the company is obligated to pay this excess income back to the customers through lower tariffs the following years
- Deficit income: company can cover this through higher tariffs the following years
- NVE annually determine the companies excess/deficit income through individual decisions (legal)





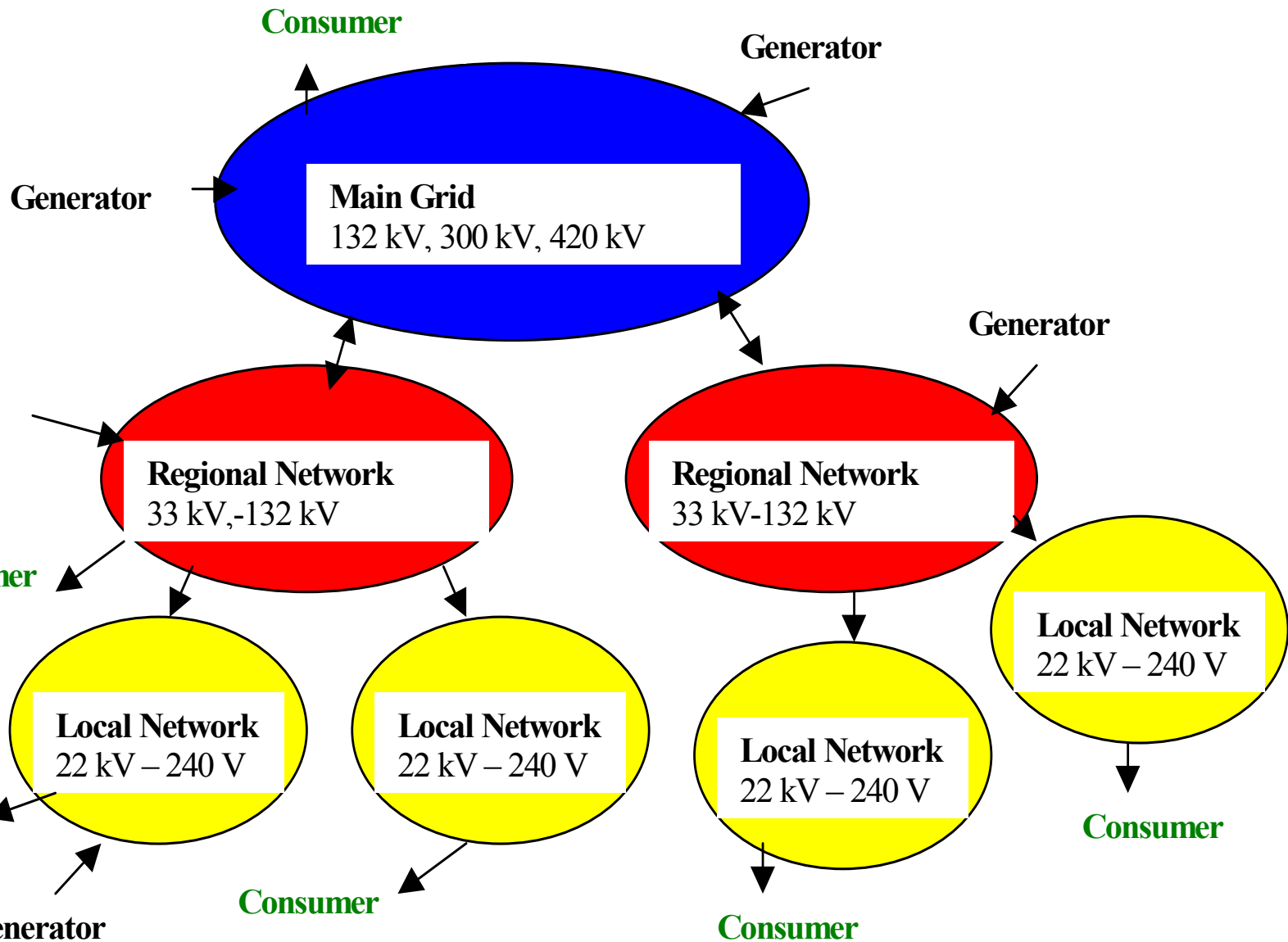
# Regulation of the tariff-structure

- NVE as the regulating authority sets the allowed level of revenue for the network companies
- NVE regulate the tariff-structure, but does not set the tariffs
- Through the Electricity Network Regulation NVE set rules/guidelines
- The network companies are responsible for working out tariffs for their network that is not in variance with the rules in the Regulations.
- NVE handle disputes concerning tariffs



# Transmission tariffs - main principles

- Tariffs are referred to connection points
- Main objective: social economic efficiency = SRMC
- Give price signals of efficient use of the network
- Tariffs are independent of power purchase contracts.
- Give non-discriminated access to the power market.
- Give the network company income within permitted income cap.





# Tariff structure in general

- Energy component (øre/kWh)
  - Covers cost of marginal losses in the network (technical losses)
    - Time – and point differentiated
- Other components – ensures cost recovery for the network owner
  - Fixed component (kr/year)
  - Load components (kr/KW)
  - Capacity components (øre/kWh)



# Connection charges in Norway

## ■ Connection-fee

- are to be general and charged all new connections in the network
- income within the income cap
- differentiated after fuse size

## ■ Investment contribution

- cost of connecting a new customer or strengthen the network for already existing customers
- income in addition to the income cap



# Practical definition - Energy component

- Energy-component (øre/kWh)
  - Cost of marginal losses
  - Point related for voltage  $> 22$  kV
    - Load flow-model that calculates marginal losses in each connection point
    - symmetrical
    - Central grid: loss factors for each node are calculated up front for an eight week period multiplied with power price and volume hour by hour
  - Time differentiated
    - $< 22$  kV: winter/summer
    - $> 22$  kV: winter day, winter night/weekend and summer.



# Residual components (other charges) for input from generators

- Central grid shall serve as a reference
  - residual components - same for all generators independent of grid level
  
- based on average annual production (øre/kWh)
  - most common: average of last ten years



# Residual component for taking out energy

- Different for different grid levels
- Fixed component (kr/year)
- Load components (kr/kW)
  - Based on customers maximum load in defined hours/periods
  - Based on max load in defined hours - the load base should not be predictable by the customer