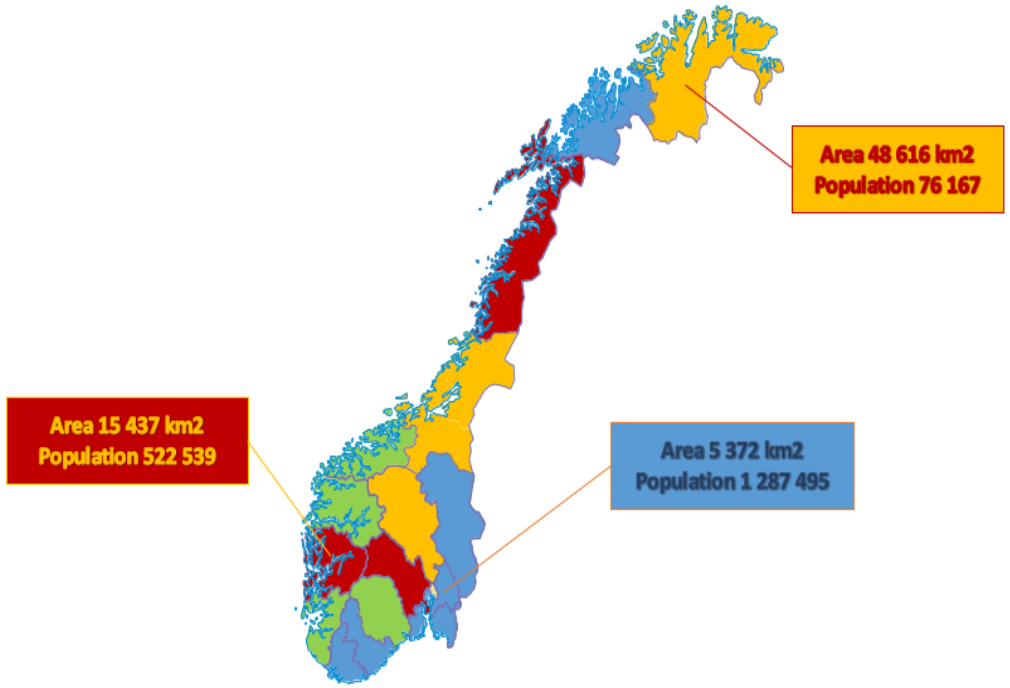
Insight into the economic regulation in Norway

Lisbeth Vingås
Director Reguatory Affairs, Elvia AS

The grid in Norway is built to handle electrical heating in cold winter hours

- Norway is a wide stretched country where both geography and topography vary between grid areas
- Production of electricity is close to 100% based on hydropower, so climate goals will mainly be met by electrification of transport
- Winters are cold and summers can be warm
- Mainly electrical heating
- Average consumption household
  - 20 000 kWh/years
  - Capacity: 4-5 kW

There are 90 DSOs (1 TSO) in Norway and the geography is different throught the country



Norway has a yard-stick model with annual income caps based on 1-year data

A new income cap is calculated each year based on annual economic and technical reporting to the NRA

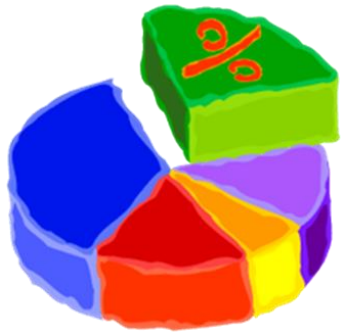
Regulated cost base (RCB) = OPEX + CENS + Tecnical losses + Depreciation + (Book-value*1% work.cap*WACC)

Income cap for year t is based on costs from t-2, but there is a mechanism that compensate for the 2-year lag on capital cost to increase incentives for investments

The industry's total return is given by the regulated WACC

Regulated cost base (RCB) = OPEX + CENS + Tecnical losses + Depreciation + (Book-value*1% work.cap*WACC)

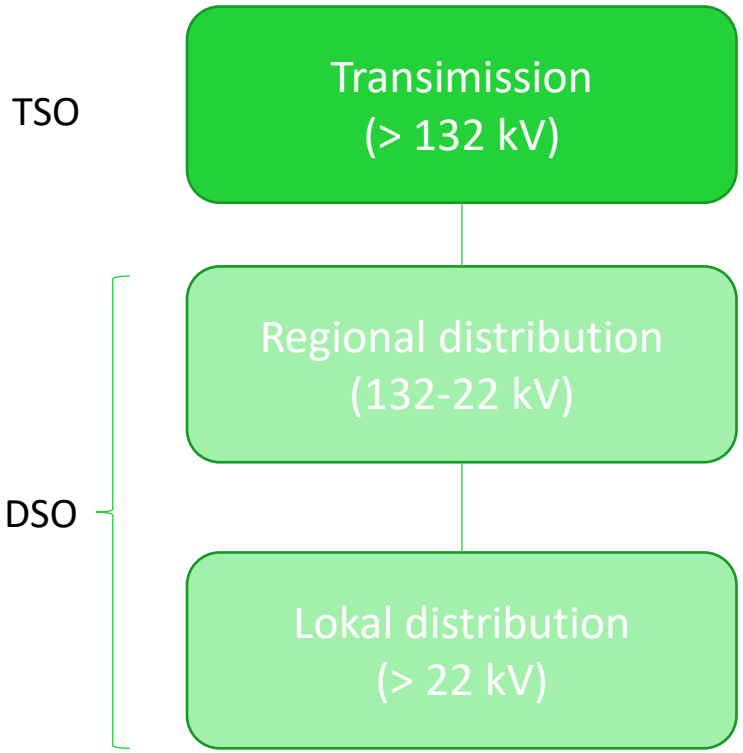
$$\sum RCB =$$



RCB: regulated costbase

- The total costbase for all 90 DSOs constitutes the total income («cake») that the industry is entitled to.
- If the industries cost increase, the cake increases and by versa.
- How much of the RCB each DSO will get covered (and thereby their rate of return) depends on their performance in the competition
- Efficiency > average = rate of return > WACC, and by versa
- Bigger cake = larger basis for the competition

Norway operated with 3 grid levels



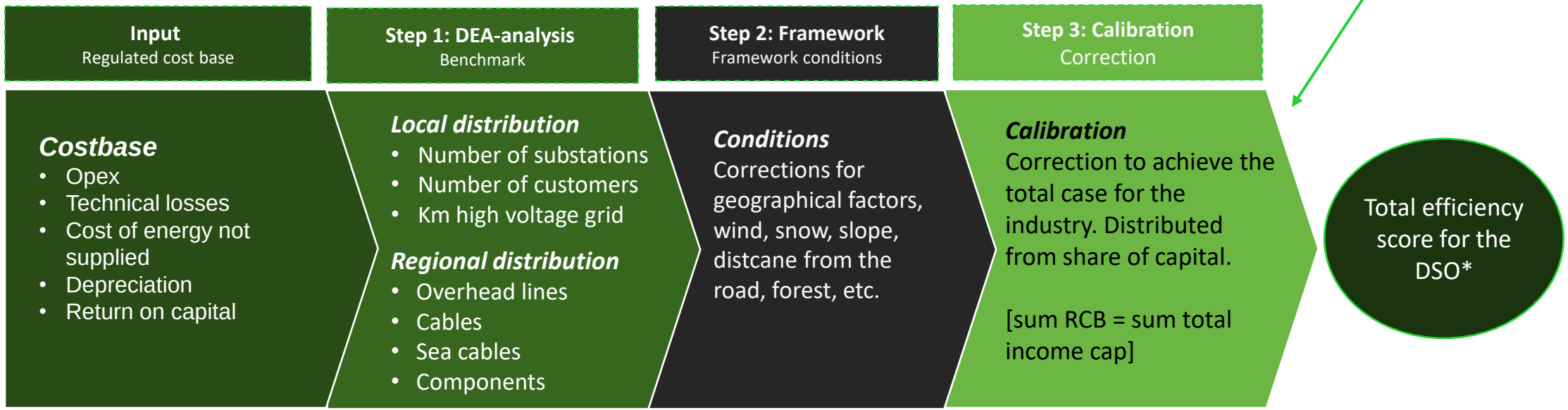
- Many DSOs own both regional- and local grid
- DSO gets one income cap – distribute to grid level
- Legal regulation different for different grid levels
- Tariffs different for different grid levels

DSOs part of the «cake» is decided thought benchmark

Income cap year t = **30%** Cost base year t-2 + **70%** Norm year t-2

Investment incentive (*) given here. The higher share of capital cost the more you get from the calibration

- The norm and efficiency score is decided in three steps:



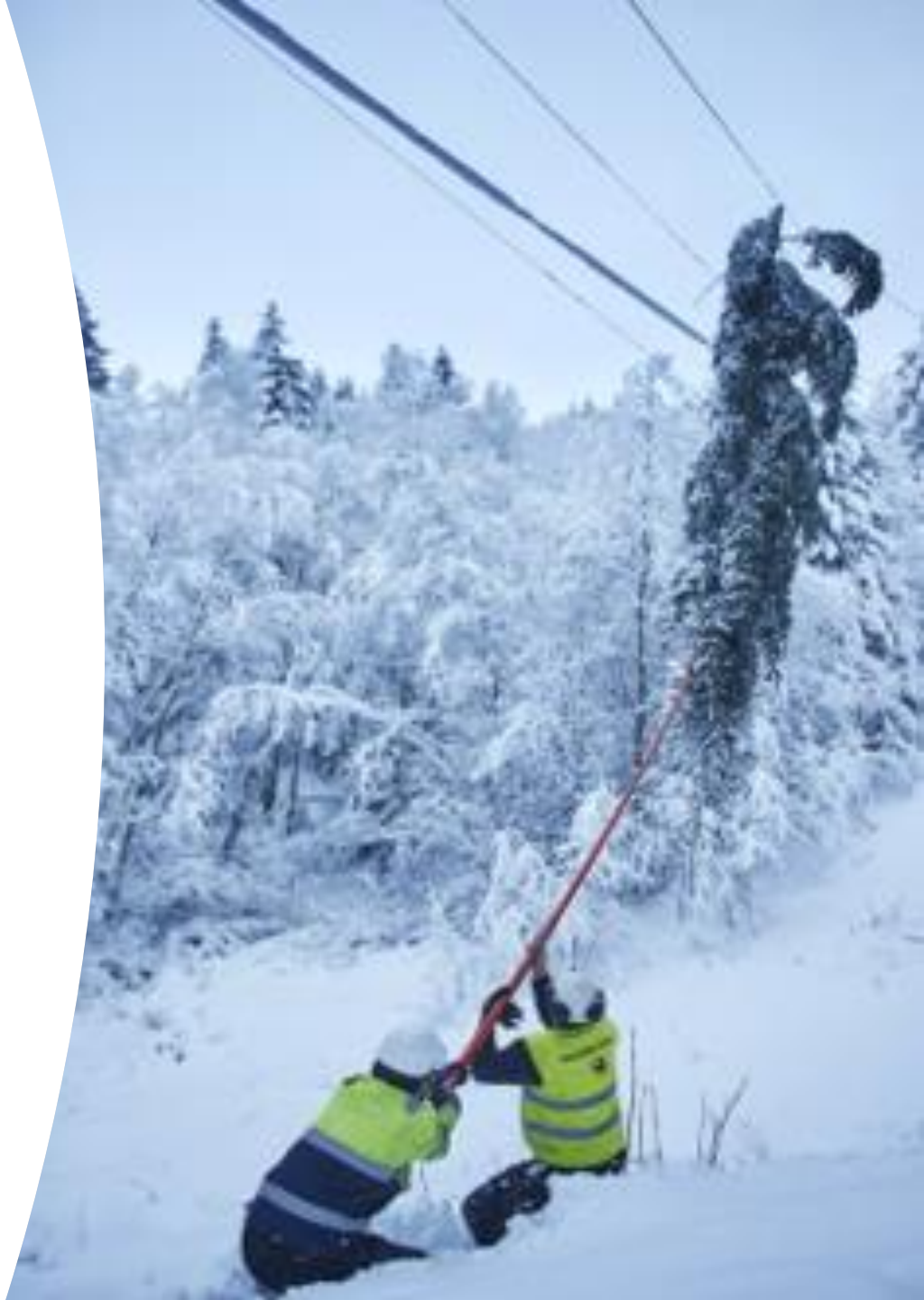
An example, efficiency score for the company DSOx

	Step 1 – DEA	Step 2 – conditions	Step 3 – calibration	Total efficiency score for grid level
DSOx	97%	-4%	+7%	100%
	DEA done in two steps. Front is sat by 5-year average data. Gives DSOx a reference-company. DSOx RCB for one year is than compared with the 5-year average RCB for the reference company	DSOx framework conditions are easier than the framework conditions for its reference-company from DEA, so DSOx effeciency-score is considered to high and will be taken down	Total income cap for the industry after step 2 did not give the total cake. The deviation is handed out to the DSOs based on their share of capital cost – and DSOx share gave them 7%	Total efficiency score for DSOx for this grid level. 100% means DSOx will fully cover their RCB in that grid level (rate of return = WACC)

CENS is included in the income cap model to assure adequate quality

* CENS = cost of energy not supplies

- NRA has prescribed a cost function for calculation CENS.
- CENS vary with the length of the interruption, time of interruption, type of customer etc.
- CENS is included in the regulated cost base as any other costs.
- CENS affect your efficiency score (norm) and is deducted from your allowed income the year the interruption occurs.



From income cap to tariffs

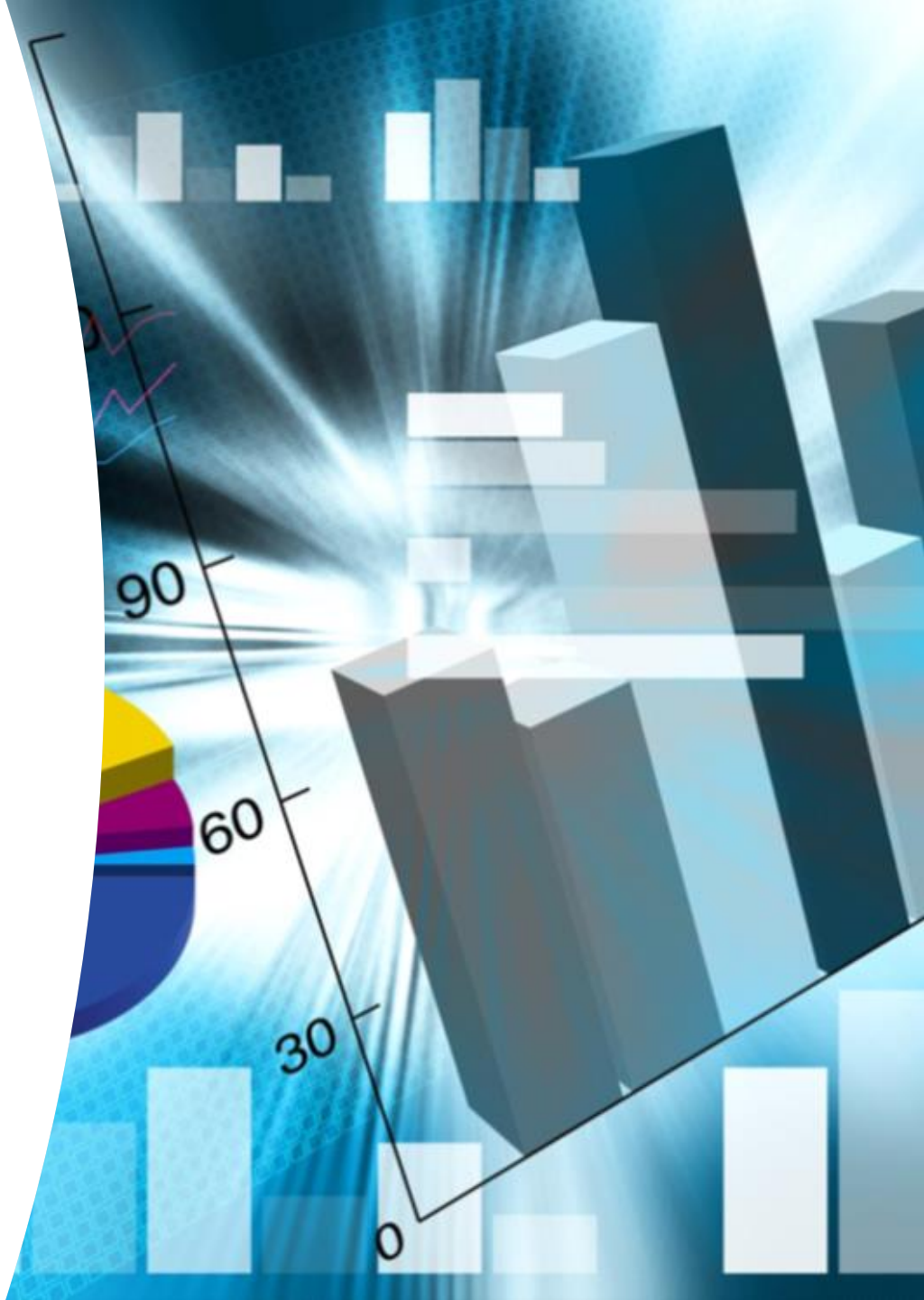
Investment incentive (*) given here. Income on investment instantly

Income cap
+ Cost from higher grid levels
+ Surplus/deficit income
+ Property tax
+ Compensation timelag investment
+ Cost national meter-hub
+ R&D-approved cost
- Annual CENS

= SUM allowed income before taxes

+ Energy fund	1 øre/kWh (ekskl. mva)
+ Electricity tax	15,84 øre/kWh (ekskl. mva)
+ VAT	25 %

= SUM allowed income after taxes



The income cap model gives strong incentives for cost efficiency and ok incentives for grid investments

Competition

- Your share of the cake depend on what others do

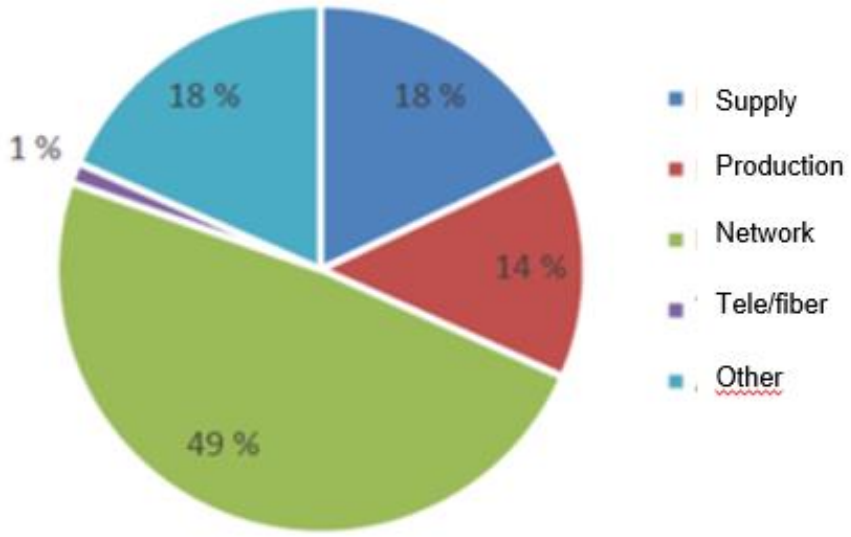
OPEX

- Increase in opex on the margin will increase your income with approximately 50%.
- Reduction in operation cost – reduces income with approximately 50%

Investments

- Cost recovery from investments vary on factors like grid level, new and re-investments, length of depreciation etc. In general new investments give more cost recovery than reinvestments.
- Reinvestments give more cost recovery than opex.

Both the economic regulation and the regulation on unbundling incentives mergers



8 DSOs > 100 000 customers
43 DSOs < 10 000 customers
23 DSOs < 5000 customers

The NRA decided in 2021 that all DSOs shall be legal unbundled from ALL other activities

From 2021 DSOs with more than 10 000 customers shall be functional unbundles from ALL other acticities.

DSOs must have separate branding

This together with high level of norm/competition in the income cap model should incentivies more mergers

Lisbeth.vingaas@elvia.no