Inventory of the losses in the electricity infrastructure in 2012, Sweden

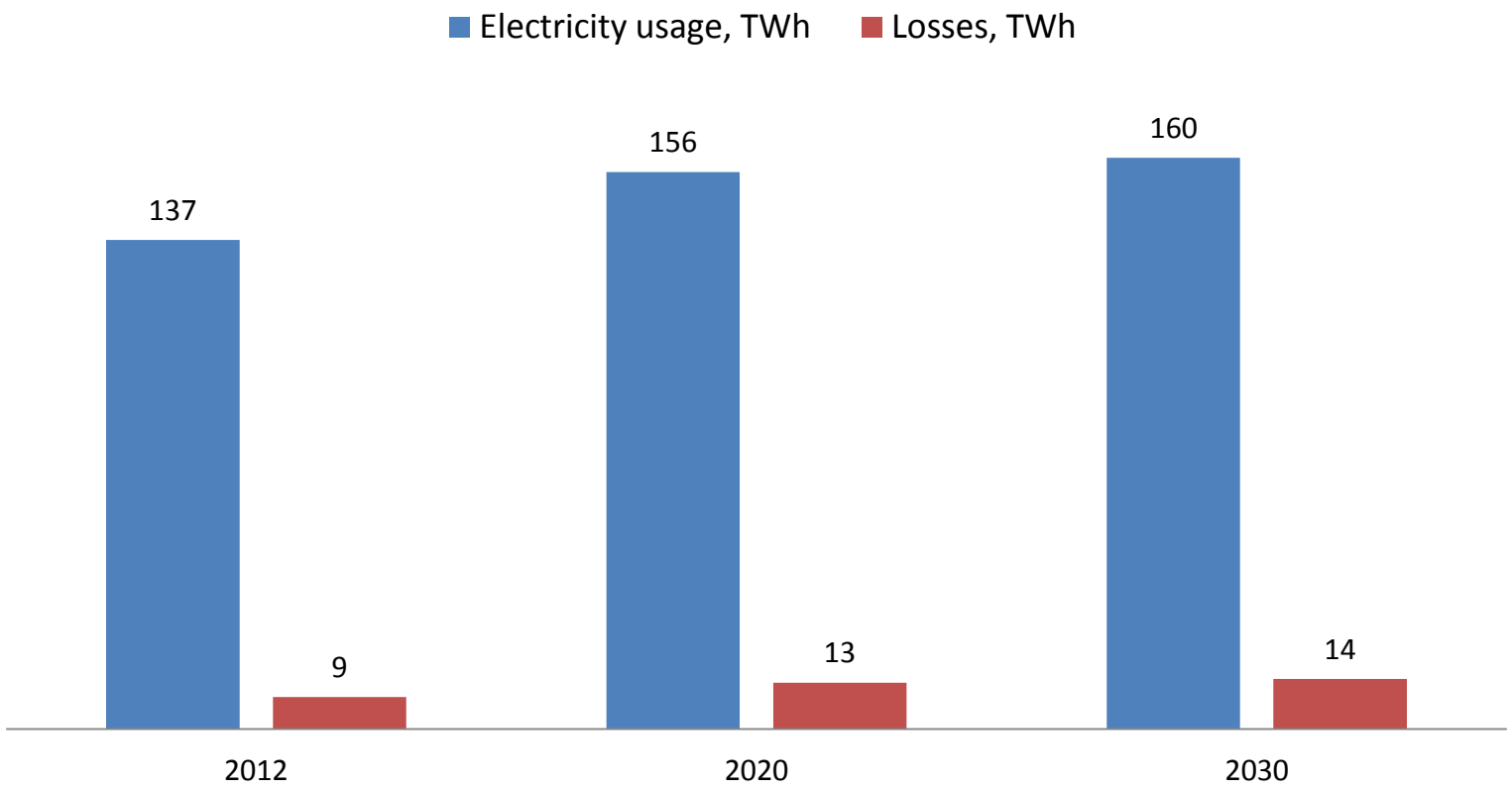
CA-EED, Milano, Oktober 17th 2014

Daniel Friberg

Swedish Energy Agency

Increasing losses in the electricity grid expected

6,6 % → 8,5% → 8,9 %



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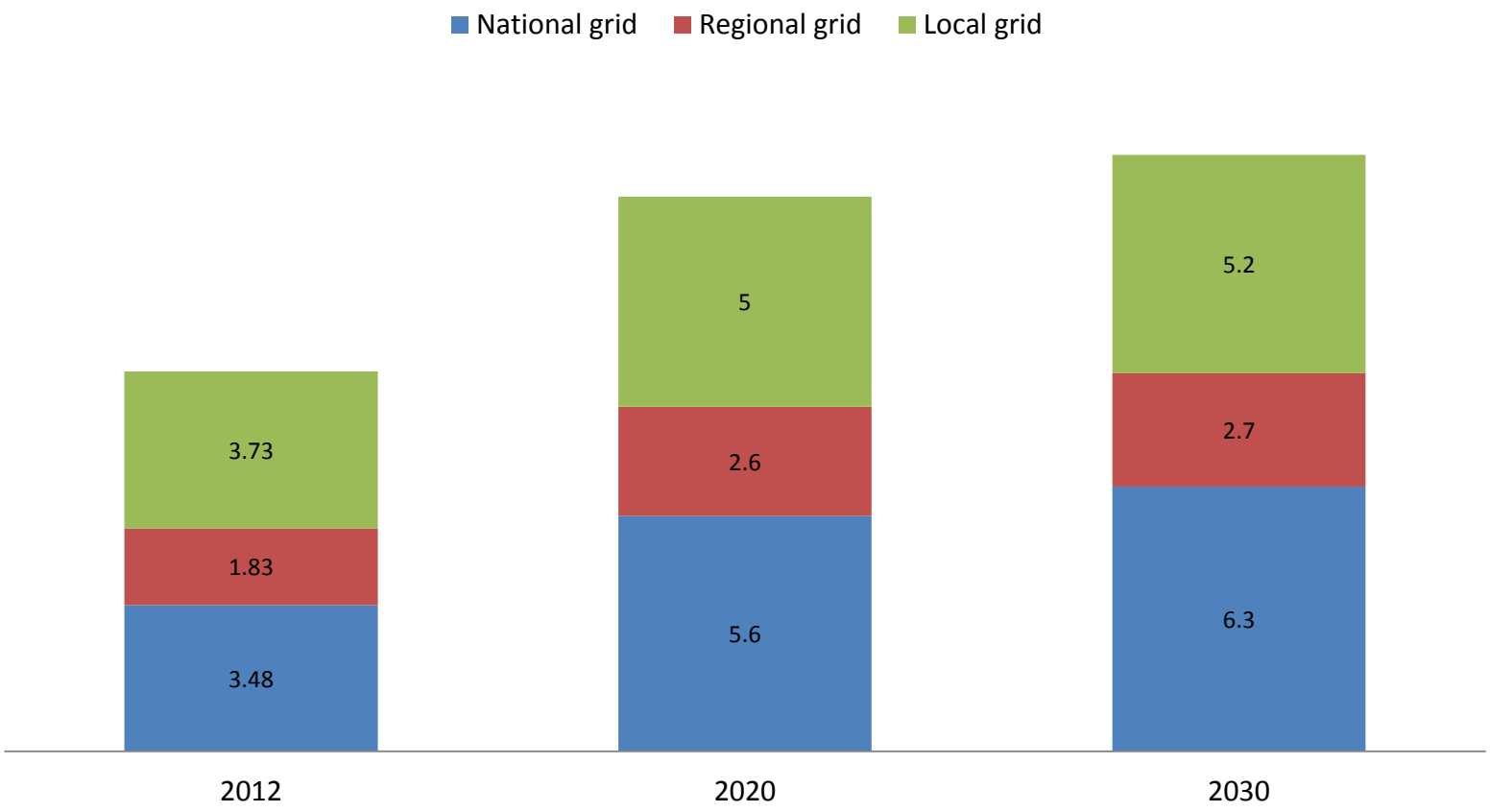
Where in the grid do the losses arise?



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Where do the losses come from?

- The geographical location of grid connections to new production sites has the biggest effect on losses.
- Hydropower is located in the north (more rain ⇨ more losses)
- Expansion of wind power in northern Sweden.
- Increased usage of electricity in the southern part

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The technical energy efficiency potential

- 500 GWh/year by 2020
- 800 GWh/year by 2030

Provided there is a change of production location.

In relation to total losses these potentials are quite small:

- **4 % by 2020**
- **7 % by 2030**

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Real potential of reducing losses

Since the market determines the location of electricity production the real potential comes down to measures that the grid companies can do.

- Potential by 2020 - 175 GWh/year
- Potential by 2030 – 400 GWh/year

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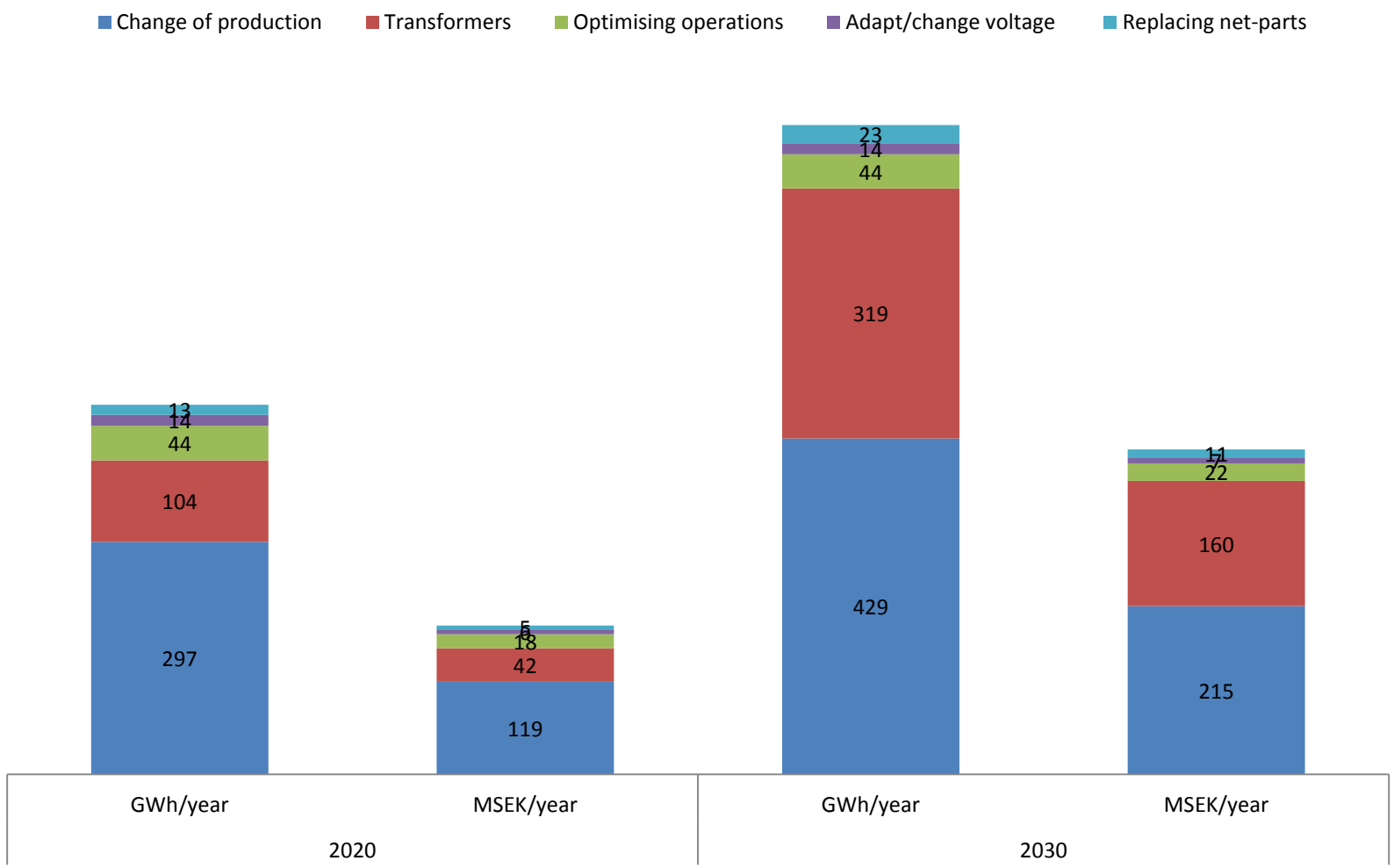
Measures to reduce losses



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Ackumulated costs and savings

- Costs of changing transformers are higher than savings by 2020
- Savings are (potentially considerably) higher than costs by 2030
- The analysis is based on rough estimations

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Changing transformers?

- Transformers will not be changed merely to increase efficiency.
- There has to be another reason to re-invest.
- In some cases it can be profitable to change the transformer before the end of its life-expectancy.
- Improved transformers (Ecodesign directive) From 1 juli 2015 ”Minimum Energy Performance Standard (MEPS)” will help this development.
- Instead of forcing a change of transformers its better to introduce incentives.

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Incentives and regulations

- A model for regulating grid operations, will probably increase incentives for investments in energy efficiency measures.
- An indicator for grid-losses will be produced comparing losses in 2016-2019 with 2010-2013.
- An increase in losses effects grid costs and energy costs.
- An incentive is produced that will increase the allowed revenue level for the grid-owners/operators when losses are reduced (and vice versa).

Price-areas might contribute to reducing losses

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No reckomendations to increase investments to reduce losses

- Relatively low savingspotential.
- Increased losses till 2020 and 2030 are only estimations.
- From a systems perspective reducing grid-losses could result in suboptimal solutions.
- Waiting for the model for regulating grid operations which will probably increase incentives for investments in energy efficiency measures.

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