


CAPACITY MARKETS

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A dark, silhouetted city skyline at night, with a few lights visible on the buildings and a dark, cloudy sky.

What happens
when the brown-
outs are coming?

Interventions!

EU development: Capacity Mechanisms are or will be implemented

UK: Developing Auction Model; 1st auction in 2014 for capacity in 2018/2019

NL: Developed Strategic Reserve Model after scarcity in 2003. Since then not activated.

SE & FI: Strategic Reserve Model (reserve dispatched if spot market deficits)

DK: discussion started

IR: Capacity Payments in place since 2005

FR: Capacity Obligation Model decided, expected start in 2015 for 2017/2017

DE: “Stillegungsverbot” to be reformed by Strategic Reserve

BE: Strategic Reserve implemented (consultation CRM ongoing)

ES: Capacity Payments since liberalisation. Discussion on redesign ongoing

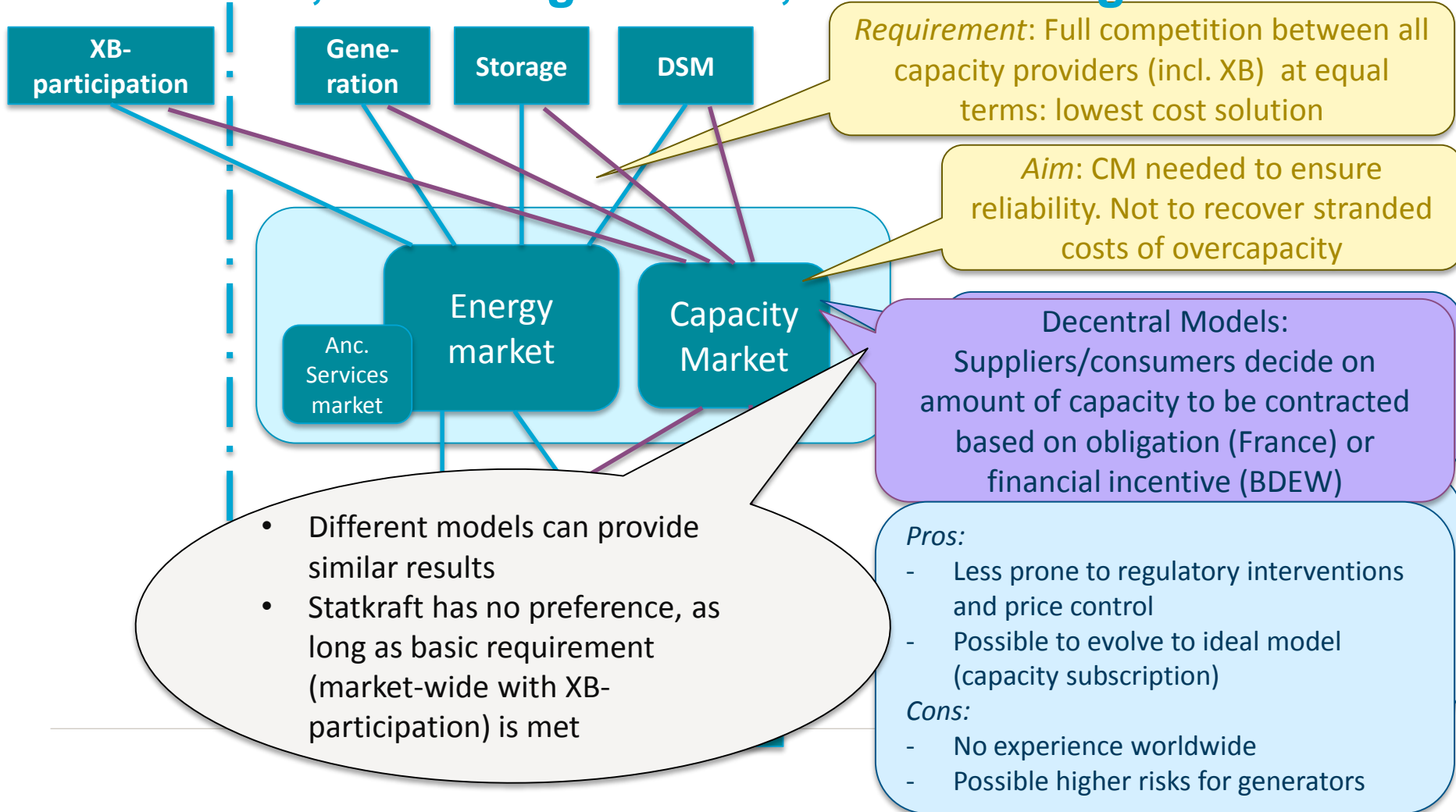
It's not about “whether” but about “how”

IT: Developing auction model with reliability contracts; 1st auction expected in 2015

Capacity Markets (CM) are unavoidable

- ▶ Increasing share of subsidized, zero marginal cost, intermittent generation results in many hours with zero prices
- ▶ Investments will only occur if investors believe that “society will accept structural appearance of scarcity”. Not realistic!
 - Acceptance of price spikes is important.
 - But main issue is acceptance of scarcity / increased risks of brown-outs
- ▶ Many EU countries already have CM or are implementing them
- ▶ Focus should be on a proper design!
 - Market based (max market, min regulatory interventions)
 - Market wide (full competition, equal treatment of all capacity providers)
 - EU solutions ideal, but at least allow for XB participation

Capacity Market is needed in case of large share of subsidised, zero marginal cost, intermittent generation



A Capacity Market is not a subsidy for conventional power plants

- ▶ CM is no aid, if it is properly designed
 - the single objective of a CRM must be to *ensure a certain, politically desirable level of reliability (“target level”)*
- ▶ Essential is that all “capacity providers” (including generators and DSM) can participate in the CM on equal terms
 - Maximum competition will deliver the most efficient solution for each the target level
 - Market will decide between generation and DSM and between new capacity or life-time extension of existing plants
- ▶ Both in an EOM as well as in properly designed EM+CM, only efficient capacity will be able to recover all its costs and make return on investment

EOM improvements are no-regret measures, but no alternative for CM

- ▶ EOM improvements, like

- *Implementation of FBMC*
- *ID gate closure closer to delivery*
- *easier participation of RES in ancillary service markets etc.*

improve efficiency of markets, but no enduring improvement of reliability.

- ▶ Some EOM improvements are of more fundamental nature, like

- *Removal of price caps*
- *Removal of exit prohibitions*
- *Solution for mark-up prohibitions*

But, main concern (interventions in case of scarcity) remains

There is no need for more *flexibility*

- ▶ Flexibility is a characteristic of an asset, it is not a product
- ▶ There is abundant flexibility in the system, and even too much (compared to what would be needed in an ideal EOM)
- ▶ Bringing more flexibility in the system by *removing barriers* will push less efficient flexibility out of the market, will reduce costs but not improve reliability
- ▶ Bringing more flexibility in the system by *subsidizing* certain sources will push more efficient flexibility out of the market, will increase costs without improving reliability

Removal of „*mark up prohibition*“ – one of key issues in German debate

- ▶ Dominant generators have to offer at costs
- ▶ Not necessarily a problem, but in practice this is felt as generators have to offer at SRMC and every generator may be dominant at certain time (of scarcity)
- ▶ A general removal of the “mark-up prohibition” is not possible (competition law has to remain in force)
- ▶ Idea for solution:
 - Focus monitoring on prices in forward markets (traded volumes 30 x higher than spot market volumes)
 - Any price spike in spot market can never be excessive (illegal) as volumes are marginal

XB participation in Capacity Markets – the key issue for the EU debate, as EU is facing a patchwork of national Capacity Markets for next 15 years: an approach

Development of “XB scarcity rules” are anyhow needed

...able “firm” capacity for XB participation.
...to the CM markets, e.g. explicit auction.
...providers that are selling XB must be faced with
...and settlement criteria (double delivery not

- ▶ No need for XB capacity reservation; the actual energy flows through interconnectors will be solely determined by the energy market.
- ▶ If the interconnector is exporting at times of scarcity in the neighbouring country is apparently higher. However, the capacity provider is still contributing to reliability to the extent as domestic capacity providers are.
- ▶ The actual availability of the interconnector is irrelevant for the design of XB participation. (Same treatment of domestic transmission grid)

Main idea: design of XB participation is based on principle of Single EU Power Market

Lead time and duration of capacity products: **another key issue for the EU debate**

- ▶ Misunderstanding 1: a lead time of more than 3 years is needed for new capacity.
- ▶ Misunderstanding 2: new capacity needs a capacity contract of more than 10 years
- ▶ An investor will invest in new capacity if he *expects* sufficient revenues from EM and CM
- ▶ If 15 yr capacity contracts are allowed for new capacity, then they should also be allowed for existing capacity. By consequence all capacity will soon be stuck in long term contracts and the capacity market will be marginal.

Avoid *price regulation*. Also of capacity prices.

- ▶ The French CM has a de facto price-cap for capacity prices
 - Admin price for capacity imbalances
- ▶ The UK CM has an explicit price-cap
 - Starting price of descending auction
- ▶ If energy price = SRMC of marginal plant, and
if capacity price = (Fixed OPEX – Revenues from EM), then
missing money problem remains

Conclusion

- ▶ Market based Capacity Markets are unavoidable and the better solution for markets with large shares of zero marginal cost, intermittent RES
- ▶ But fully market based Capacity Markets are not an obvious choice
- ▶ XB-participation is needed and might be the life line for well-designed, market based Capacity Markets integrated in the IEM

Back-up slides

The reservoir capacity of Lake Blåsjø is 7.8 TWh

compare: total German storage capacity 0.04 TWh

Area 80 km², elevation :1055m



NORWAY: 84 TWh

(50% of Europe's reservoir capacity)

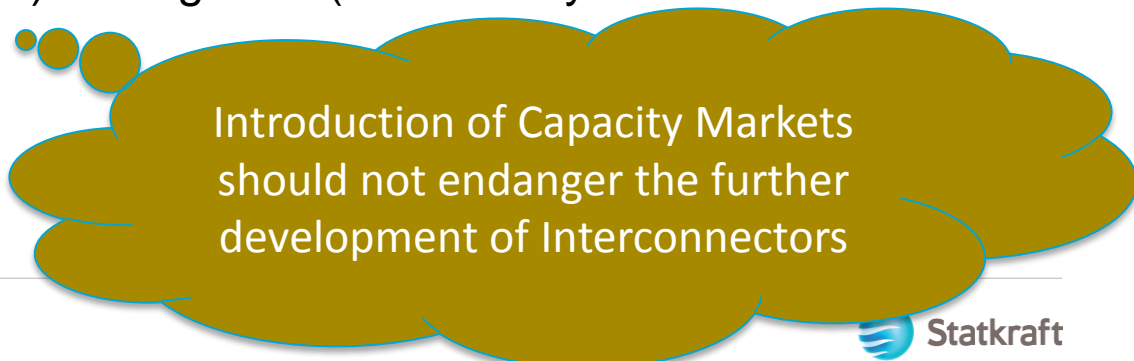
Options to provide flexibility:

1. Change the operation pattern in existing plants **28 GW ***
2. Increase installed capacity **+7-8 GW**
3. Build pumped hydro storage in connection with existing reservoirs + **15-20 GW**

*) This figure should be compared with the maximum load in Norway of 23 GW. So 28 GW means at

Role of interconnectors

- ▶ Interconnectors between markets with hydro plus seasonal storage and markets with intermittent RES, are the most effective solution to allow for integration of renewables
 - Investment costs of interconnectors are not a cost, as these costs can be recovered by making use of structural price differences in periods without scarcity
 - Flexibility of storage can be expanded without costs
- ▶ Seasonal storage plus interconnectors can provide all types of flexibility from short term (primary control) to long term (several days/weeks with no or little wind)



Introduction of Capacity Markets
should not endanger the further
development of Interconnectors