

# NGDP 2021 webinar questions that were not answered during the webinar

1. Have you also evaluated the DISTRIBUTION of new installed capacity (MW) and energy (MWh) linked to each Bidding Zone in the Nordics and as such on existing or possible new Bidding Zone configuration? 2. It is a bit hard to understand why price differentials would will increase by 2040 given that (a) your supply/demand ENERGY balances per BZ for most BZs in the North go from plus to minus and opposite in Southern BZs except from DK , and (b) significant upgrades (increases) of cross zonal grid capacities, and (c) more stable ENERGY consumption in the North due to mainly driven by industrial demand. What is then driving what is said to be bigger price differences?

**1a) Each TSO has provided input for its own country, where distribution of new capacity has been made between the existing bidding zones of the country, but not between different countries.**

**1b) A review of bidding zones is ongoing on European level and has therefore been out of scope for this project.**

**2) The price differences are calculated as the average of hourly absolute price differences, hence the presented price differences are also affected by volatile flows and not only by annual energy balances.**

2. Have you identified a need for new interconnections between the nordic countries? and if yes where are they needed?

**The price differences give indications on were there might be good to increase the grid capacity, but since no cost-benefit analyzes nor grid studies has been made, no new investment projects has been identified at this stage.**

**The project Aurora line (CB1) is being planned, but that was initiated already before NGDP2021. Please see Chapter 7.2 for a list of projects.**

3. Do you think there will be new bidding areas in the Nordics in the near future or later and where if any?

**A review of bidding zones is ongoing on European level and has therefore been out of scope for this project.**

4. If DSR will not emerge to less than 1 GW, incl P2X. How will then the deficit be handled during cold and low-wind weather. And of course how will the cost for those assets be compared to new plannable non-fossil production.

**If new demand – like P2X – is not as flexible as we have assumed, then the consumption growth might be lower. Flexibility is a prerequisite for the consumption growth**

**rate we expect. We need both the flexible consumption and peak capacity (batteries, hydrogen fuel cells / turbines, pump hydro) to balance the system. If there is less flexibility, peak prices will be higher since we will require more expensive flexibility or peaker plants, and less new demand is likely to be established. The exact proportion of consumer / producer flexibility will be determined by the market, we do not have an exact estimate. However, we know for sure that we need both to manage projected consumption growth.**

- 5 which companies would you consider to be the main key players in the developing the off shore wind? How can we secure an stable integrated line between the on and off shore, and other energyproduction?

**We do not know which companies will be the main key players in developing the offshore wind. Cooperation between the countries around the sea basins within for example grid planning will help setting up systems that can handle onshore and offshore energy production.**

- 6 You show large need for DSR. P2X flexibility etc 2040 . Do you see that this well be realised with regulation or market solutions where aggregators and other parties get economical incentives to contribute will be realised :-)

**We suppose that the actors will be flexible because it will be economically rational for them. When it comes to P2X we have made calculations which show that it will be rational to disconnect the electrolysers some of the time to produce only at the time of low power price. The exact utilization factor depends on how investment costs for electrolysers and hydrogen storage develops. However, it is likely that nonstop production of hydrogen will not be the best strategy. When it comes to smaller consumption, we believe that it will also become more flexible when the actors get the right incentives. An example can be the new grid fee tariff introduced in Norway from 2022 which combines the time of use and max power pricing for households and small commercial actors.**

- 7 Question: Are any of the TSOs considering changes in the grid tariff, for instance intensifying locational signals to locate new consumption/generation more favorably in the transmission system and by that reduce the need to build transmission capacity?

- **Fingrid: We are investigating flexibility markets (i.e. use of locational signals), but currently there are no plans to change the tariff structure.**
- **SvK: Changes of the tariff were made 1.1.2021 to promote flexibility: [Förändringar i transmissionsnätstariffen 2021 främjar flexibilitetslösningar | Svenska kraftnät \(svk.se\)](#). There is currently**

**a review of the tariff, but no decisions have been made so far. Furthermore, we are waiting for a new regulation on this topic, from Energimarknadsinspektionen (Swedish regulator).**

- **Statnett: The TSOs always seeks to utilize the power system in a most optimal way. The Norwegian regulator NVE will from next year introduce a new tariff which is more related to the use of maximal power than energy consumption for all residuals in Norway.**
- **Energinet: We don't use these instruments today – But it is something that is being looked into currently, both politically and internally in Energinet.**

- 8 The emerging energy and power gap due to the decommissioning of thermal plants is interesting, but hopefully the market will react to the price signals. But as is illustrated in Sweden, lower shares of thermal plants reveal a gap concerning transmission ability, what is the strategy for closing this gap?

**Investments shall be made to remove structural price differences, but it is for the market actors to provide needed generation or possibly other needed flexibility such as storage or DSR.**

- 9 You mentioned that you will consider use of alternative measures such as DLR when considering investments - but to what extent are these alternatives part of your scenarios, i.e. of your estimates of necessary investments?

**We assume that some categories are more price sensitive – such like hydrogen production and to some extent electrical vehicles. In the other industry categories, there is some flexibility as well. You will also find a description in the scenario assumptions.**

- 10 Do you consider use of alternatives to building grid, like the use of grid enhancing technologies, to manage the bottlenecks?

**We are investigating several different alternatives for grid capacity and managing bottlenecks. These include dynamic line rating, compensation equipment, flexibility markets, etc. Some of these alternatives have been already taken into use in some parts of the Nordics (such as dynamic line rating and various different compensation equipment). The goal is to have the most cost-efficient way of managing the system.**

- 11 Will smaller rated renewable power units be required to contribute to grid stability (question to the last presenter)

**We are investigating the requirements of generators in the future system. Since the future system is probably converter dominated, it is likely that some new requirements will be set for converters (for example**

**converter connected wind or solar power). The requirements for generators are updated at a European and national level. We will include stakeholders in these processes as well.**

- 12 Thanks Ola for your partial answer, while I am not sure why "accumulation" (?) of absolute price differences per hourly (or 15 Min) MTU is used to conclude that price differences are expected to increase. That said I understand your claims that if DSR, storage and batteries etc. combined with increased Cross Zonal capacities is not judged to be sufficient to cope with short term variations in expanding intermittent RES production spread across the Nordics and interconnected Northern continental Europe.

**We think that absolute price difference is a good method to calculate the price difference between areas. This is also related to the fact that the power prices are varying between the areas – sometimes lower and higher one after the other.**