



Danish  
Utility Regulator

# Market Report 2021

## The Danish Wholesale Electricity Market

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ENGLISH SUMMARY OF "MARKEDSRAPPORT FOR  
2020, ENGROSMARKEDET FOR EL"

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**DANISH UTILITY  
REGULATOR**  
Torvegade 10  
3300 Frederiksværk

Tlf. 4171 5400  
post@forsyningstilsynet.dk  
www.forsyningstilsynet.dk

## SUMMARY

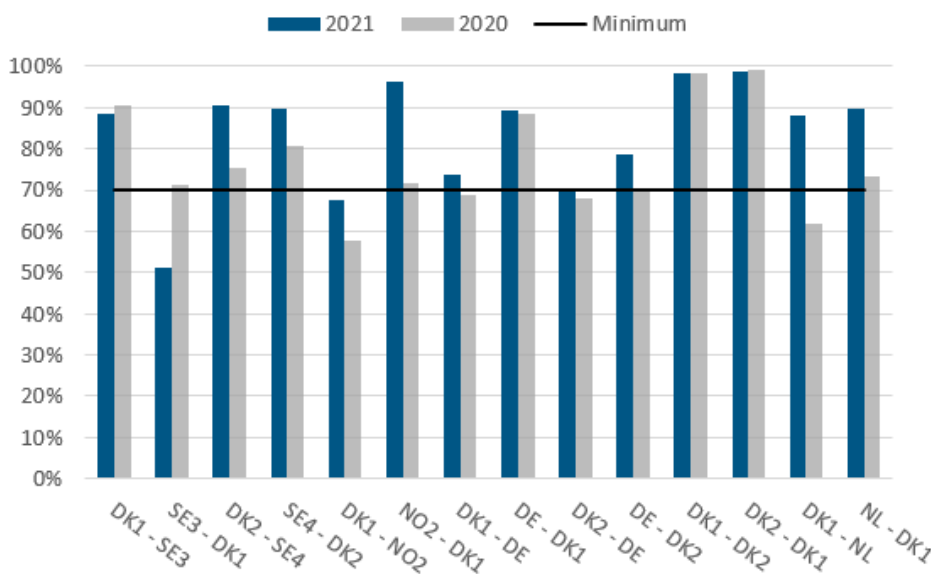
Electricity generation in Denmark was 32.6 TWh in 2021, which is an increase of 16.8 pct. compared to 2020. The generation mix in Denmark is undergoing a major change, in which the generation shares of wind, solar and biomass are growing at the expense of coal and gas.

The Danish electricity consumption was 36.6 TWh in 2021, which is an increase of 7.5 pct. compared to 2020. The electricity consumption is larger in the winter than in the summer because of the increased need for heating and light. The largest monthly consumption was in December (3.5 TWh) while the lowest was in July (2.7 TWh).

Denmark was a net importer of electricity with a total of 4.5 TWh in 2021 and has been a net importer since 2011. Net imports have decreased 26 pct. in comparison to 2020. Denmark imported most electricity from Norway (7.9 TWh) and exported most to Germany (8.2 TWh).

The average available capacity for trade on the cross-zonal transmission lines in 2021 was 82 pct. of the nominal capacity, in the export direction. In the import direction, it was 85 pct. An overview of the available trading capacity to and from West Denmark (DK1) and East Denmark (DK2), measured as a share of the nominal capacity in the cross-border interconnectors is presented in figure 1.

FIGURE 1 | AVAILABLE CAPACITY FOR TRADE, MEASURED AS A PERCENTAGE OF THE NOMINAL TRANSMISSION CAPACITY FOR 2021.



Source: Energinet and Nord Pool.

Note: The figure shows the average available capacity for trade as a percentage of the nominal capacity on the respective interconnectors.

With the Electricity Market Regulation 2019/943, a minimum requirement of 70 pct. capacity for cross-border trade was imposed as of 1 January 2020. The Regulation gives the possibility for derogation from the minimum requirement, which is subject to the approval of the relevant national regulatory authority.

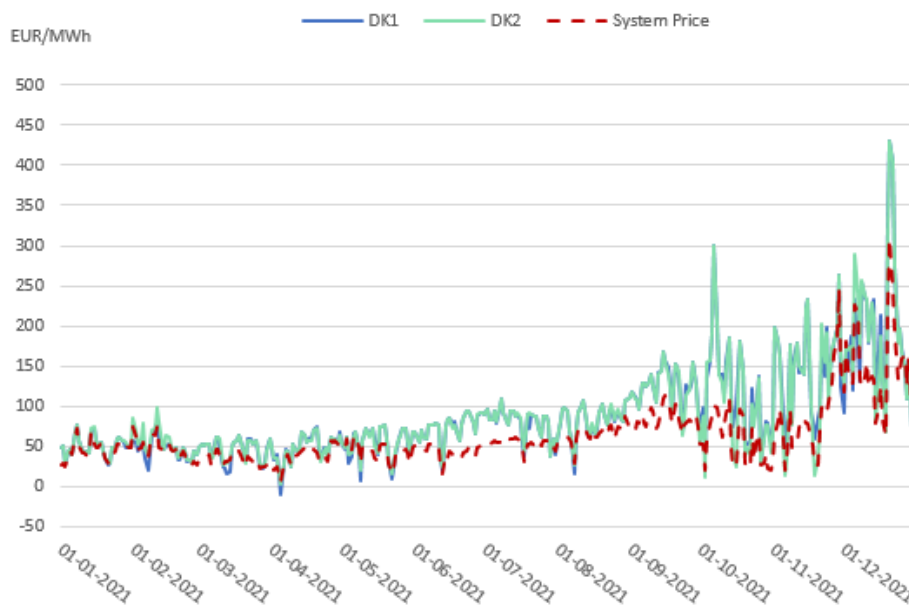
ACER publishes twice a year a report in which they monitor the compliance of the 70 pct. minimum requirement. ACER has in addition developed a recommendation in which it is elaborated how to assess the minimum requirement. It is the task of the national regulators to enforce the minimum requirement.

The calculated capacities for cross-border trade in this report are not calculated following the ACER's recommendation. Instead, the capacities are calculated as the average available capacity compared to the nominal capacity. Therefore, DUR has not in this report evaluated whether Energinet or other TSOs have complied with the 70 pct. requirement.

On the border between DK1 and Germany, TenneT and Energinet performed countertrade to ensure system security in Germany when the trading capacity is higher than the physical capacity on the DK1-Germany border. The countertrade amounted to 5 TWh in 2021. TenneT uses countertrade to ensure system security.

The average hourly prices in the day-ahead market in 2021 for DK1 and DK2 were 88 EUR/MWh in both bidding zones (see figure 2). This amounts to a price increase of 252 pct. in DK1 and 209 pct. in DK2. The system price, which is a fictive day-ahead price that would have occurred if the Nordic countries were one bidding zone without any limits on its transmission capacity, was 62 EUR/MWh. As Denmark is located between the Nordic region's hydropower-based and the Central European thermal and renewable-based electricity generation, it effectively acts as a transit country between two different generation mixes.

FIGURE 2 | DAILY PRICE DEVELOPMENT OF THE DAY-AHEAD MARKET IN 2021



Source: Energinet

Note: The development in day-ahead prices for West Denmark, East Denmark and the system price.

The price of electricity in Denmark is affected by the prices of fuel, CO<sub>2</sub> and by the filling ratio of the Nordic hydro reservoirs. The price of gas increased sharply during 2021, which is the main driver of the increasing prices in 2021.

Market participants use the intraday market to balance their consumption and generation portfolios, for instance when they experience an outage or if there is less wind than expected. The intraday price was 84 EUR/MWh in DK1 and 86 EUR/MWh in DK2.

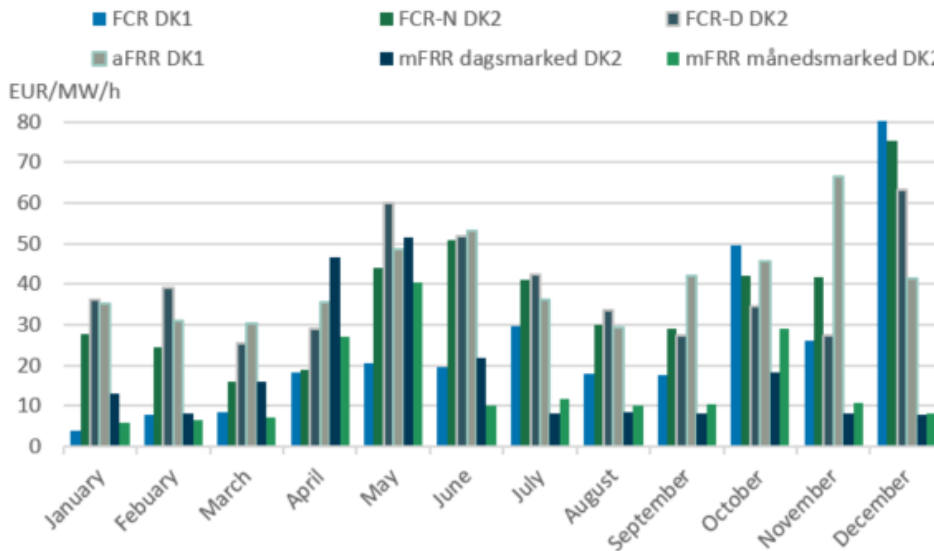
The Danish TSO, Energinet, purchases reserve capacity and reserve energy to balance the system before the operating hour. Energinet spend €183 million on reserves in 2021.

In 2021, the market for manual frequency restoration reserves (mFRR) were split into a daily and monthly auction. In total, Energinet spend €88 million on mFRR in 2021.

In December 2021, only one market participant submitted bids in the monthly auction for automatic frequency restoration reserves (aFRR). In January 2022 the price of aFRR reached a historical high price of 146 EUR/MW/h. As a result of the low liquidity in the market, Energinet changed from monthly to weekly auctions.

The average prices for the different types of reserves are presented in figure 3.

**FIGURE 3 | MONTHLY AVERAGES FOR RESERVE CAPACITY PRICES IN DK1 AND DK2 IN 2021**



Source: Based on data from Energinet.

Considering the recent developments in the Danish wholesale electricity market as well as ongoing regulatory changes, DUR will in 2022 focus its market surveillance efforts on specific areas (see Box 1 with DUR's focus areas for surveillance of the Danish wholesale electricity market).

The first focus point is the trade capacity on the transmission lines to and from DK1 and DK2. DUR will have an increased focus on the transmission lines between Denmark and Sweden as a result of the Swedish TSO, Svenska Kraftnät, application for derogation for the 70 pct. requirement.

DUR will also monitor the market for aFRR in DK1. This is due to the low liquidity in the market and the change from monthly to weekly auctions.

Finally, DUR will have focus on the market for mFRR due to the split into a daily and a monthly auction.

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**BOX 1 | WHOLESALE ELECTRICITY MARKET SURVEILLANCE: FOCUS AREAS IN 2022**

DUR's focus areas for future market surveillance in wholesale electricity markets are the Danish transmission lines, the market for automatic reserves in DK1 and market for manual reserves in DK2.

DUR's market surveillance in 2021 will continue to have focus on the trading capacity on the interconnectors between Denmark and the neighbouring countries. The market surveillance will also follow the development of application for derogation for the 70 pct. requirement from Svenska Kraftnät.

DUR's market surveillance in 2022 will continue to follow the market for manual frequency restoration reserves in DK2.

DUR will in 2022 have increased focus on the market for automatic frequency restoration reserves in DK1 due to low liquidity.

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In 2021, there has been several main events in the Danish wholesale electricity market. Table 1 summarizes these main events and regulatory changes and developments in the Danish wholesale electricity markets, which have taken place in 2021.

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TABLE 1 | MAIN EVENTS IN THE DANISH WHOLESALE ELECTRICITY MARKET IN 2021.

<b>1 February 2021</b>	Denmark enters into joint Nordic balance settlement. Read more <a href="#">here</a> .
<b>12 March 2021</b>	DUR approves Energinet's request for an exemption from implementing 15-minute imbalance settlement. Read more <a href="#">here</a> .
<b>18 March 2021</b>	DUR launches anthology series on better regulation in the energy sector. Read more <a href="#">here</a> .
<b>30 June 2021</b>	DUR decides on Energinet's methodology for trading with local flexibility for handling local bottlenecks in the electricity transmission network. Read more <a href="#">here</a> .
<b>27 July 2021</b>	ACER publishes a Framework Guideline prior to the creation of a network code for cybersecurity regarding cross-border electricity flows. Read more <a href="#">here</a> .
<b>22 September 2021</b>	DUR approves Energinet's method for regulated rice for system services. Read more <a href="#">here</a> .
<b>12 October 2021</b>	DUR approves Energinet's proposal for rules for TSO settlement of intentional and unintentional exchanges of energy within the continental European synchronous area.
<b>25 October 2021</b>	DUR approves Energinet's changed terms and conditions for balance responsible parties. The notification is a consequence of the EU regulation laying down guidelines for balancing electricity. Read more <a href="#">here</a> .
<b>15 November 2021</b>	ACER publishes preliminary analysis of the high energy prices and the current market design. The final analysis will be published during 2022. Read more <a href="#">here</a> .
<b>16 November 2021</b>	DUR expresses disagreement in new Swedish derogation from capacity requirements for transmission connections. The derogation will mean that Svenska Kraftnät is exempt from giving at least 70 pct. of the available transmission capacity to the market in 2022 when it will affect system security. Read more <a href="#">here</a> .
<b>19 November 2021</b>	NordREG hosts a seminar on developments in the Nordic wholesale and transmission market. Read more <a href="#">here</a> .
<b>30 November 2021</b>	Energinet, Statnett, Svenska Kraftnät and Fingrid decide to establish Nordic RCC A/S to coordinate the operational planning of the overall Nordic electricity system. Read more <a href="#">here</a> .
<b>10 December 2021</b>	DUR and the other Nordic regulators host a virtual seminar on transparency and integrity in the energy markets. Read more <a href="#">here</a> .
<b>10 December 2021</b>	DUR approves Energinet's method Cost Plus. Read more <a href="#">here</a> .
<b>14 December 2021</b>	DUR approves Energinet's method for supplying capacity reserves from fluctuating renewable energy sources. Read more <a href="#">here</a> .
<b>17 December 2021</b>	ACER publishes amendments to the guidelines for capacity allocation and management of capacity constraints (CACM 2.0). Read more <a href="#">here</a> .

Source: DUR, based on its own decisions; Energinet; Danish Energy Agency; Agency for the Cooperation of Energy Regulators (ACER).