

**ENERGINET**

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MEMO

MARKET INFORMATION REGARDING COBRACABLE

COBRACable will according to the current plans go into operation in the end of Q1 2019. The interconnector is 700 MW and connects The Netherlands and West Denmark (DK1). Below the market setup for COBRACable is described.

1. Reasoning behind market information

COBRACable goes live at the same time many of the methodologies given by the network codes are being developed. COBRACable will, like all other Danish interconnectors, be integrated in the methods given by the network codes, but as these are not fully developed or implemented at go-live of COBRACable, Energinet wants to make sure that the markets and The Danish Energy Regulatory Authority (DERA) are informed about the market setup of COBRACable. It is to be noted that none of the principles for COBRACable given below are in conflict with the principles that are expected from the network codes. This document has the sole purpose of ensuring that the market is informed of COBRACable and the market setup.

2. Two Price Zones in Denmark

Go-live of COBRACable does not change the fact that there will be two spot price areas (bidding zones) in Denmark, DK1 and DK2, with separate bidding and scheduling.

3. Day Ahead Market

The total available capacity of COBRACable will be available for the market coupling – this means that no reservations are expected on the interconnector in relation to the day ahead market.

The transmission loss of the cable is expected to be around 19 MW when the interconnector has full flow. The loss will be covered by the same principles that govern the Skagerrak interconnector. Energinet and TenneT are exploring the possibility of introducing implicit losses on COBRACable. In case the method is to be changed to implicit transmission losses a separate methodology application will be required..

4. Ramping Restrictions

Trade on COBRACable will be limited by a ramping restriction. The ramping restriction entails that the flow on the interconnector at a maximum can be changed with +/- 700 MW from one hour to the next.

The ENTSO-E Operation Handbook which is currently the guiding principles for a Synchronous Area Agreement prescribes that ramping can take place in a window of 10 minutes around the change of the hour.

The reason for the ramping restriction is the transmission grid in DK1 and the fact that DK1 to a high degree is a transit area for hydro power from the Nordics to the continent and wind power in the opposite direction. This means that high voltages can arise especially around the change of the hour when ramping of the Nordic HVDC-interconnectors occurs.

Energinet has performed an analysis which shows that the voltage levels can increase to insecure levels in times with maintenance on reactive components in the transmission grid in DK1 if ramping is done with more than 70 MW/minute corresponding to a change of 700 MW in the ramping window around the change of the hour.

5. Intraday Market

The remaining available capacity after the day ahead market will be available to XBID.

Trade via XBID is also subject to the ramping restriction which ensures that the total flow on the cable does not change with more than +/- 700 MW from one hour to the next.

6. Regulating Power Market

DK1 is an integrated part of the Nordic Regulating Power Market. All activation of regulating power for balancing purposes in DK1 has to happen via the Nordic Regulating Power Market. It is not expected that COBRACable will be used for exchange of regulating power. COBRACable can, however, be used in the case of a trip of COBRACable via countertrade / redispatch. In case of sudden internal grid issues in Denmark or The Netherlands countertrade / redispatch can also be used on the COBRACable. In Denmark this will be done via special regulation.

In the Guideline on Electricity Balancing (GLEB) cross-border activation of mFRR and aFRR is envisioned. Energinet and TenneT TSO B.V. (TenneT) expect that COBRACable will be used for this purpose when the methodologies in GLEB are approved and implemented.

7. FCR

COBRACable will not be used to purchase FCR or cross-border activation of FCR.

Seen from an operational perspective it does not make sense to use COBRACable for activation of FCR as this concerns very small amounts of energy which has an unobstructed path via the AC-grid where there is no need for operation of the interconnectors.

8. aFRR

COBRACable will not be used for purchasing aFRR or cross-border activation of aFRR. Joint purchasing of aFRR would require a reservation of capacity on the COBRACable. Considering the annulment of the reservation on the Great Belt interconnector and the preliminary ruling regarding annulment of the reservation on the Skagerrak4 interconnector it is not expected to introduce a reservation of capacity on COBRACable.

9. mFRR

COBRACable will not be used for purchasing mFRR or cross-border activation of mFRR this will also require a reservation of capacity on COBRACable. Considering the annulment of the reservation on the Great Belt interconnector and the preliminary ruling regarding annulment of the reservation on the Skagerrak4 interconnector it is not expected to introduce a reservation of capacity on COBRACable.

10. Imbalance Netting

TenneT and Energinet expect to use COBRACable for imbalance netting via the IGCC collaboration which both The Netherlands and DK1 already participate in.

11. Countertrade / Redispatch

Energinet and TenneT have agreed that countertrade / redispatch can be used on COBRACable in situations where there are issues with the cable which requires a sudden reduction of capacity or in case of a trip of COBRACable.

In exceptional situations where one of the TSO's has internal limitations which leads to a need of reducing the capacity within the operational day countertrade / redispatch may be used.

12. DC Loop Flows

A DC Loop Flow is an intentional act by the TSO's where the power is redirected via one or more HVDC-interconnectors. Energinet already utilises DC Loop Flows in collaboration with the TSO's in the Nordic, Poland and North Germany (TenneT TSO GmbH and 50Hetz).

DC Loop Flows are used to relieve congestions in the AC-grid when there is available capacity in the desired direction on the interconnectors in question. DC Loop Flows are regarded as TSO-TSO assistance which does not affect the power markets. DC Loop Flows are a cost free alternative to countertrade / redispatch in case of congestion in the AC-grid.

Energinet and TenneT (NL) are considering the use of COBRACable for DC Loop Flows which TenneT (DE) has expressed interest in.

13. Reactive Effect

The COBRACable converters are based on VSC technology which means that they can provide up to 230 Mvar reactive power both inductive and capacitive without reducing the active power on the cable. Energinet and TenneT plan to utilize this function. It contributes to securing the voltage levels in DK1 and the Netherlands especially during ramping but also at other times.

The utilisation of reactive power from COBRACable is not expected to have any impact on Energinet's purchase of system supporting abilities..

14. Long Term Transmission Rights

Long Term Transmission Rights will be sold on COBRACable. Long Term Transmission Rights are expected to be auctioned off for the first time one month after stable operation has been observed on COBRACable. This means that the first auction is expected to be in May 2019 with delivery in June 2019. Energinet expects the Long Term Transmission Rights to be sold as fi-

financial transmission rights. Long Term Transmission Rights require separate approval for Energinet, which will be applied for by Energinet with DERA.

15. Future Regulation

COBRACable goes into operation at the same time as new regulation is implemented via the network codes. COBRACable will follow the new regulation as they are approved and implemented. This can lead to changes in some of the principles above for example in relation to GLEB which might change the use of reservation of capacity on COBRACable. COBRACable will also be subject to the methods in the capacity calculation region (CCR) when these are approved as well as when the methods have been amended to contain COBRACable.

15.1 Guideline on Capacity Allocation and Congestion Management (CACM)

The guideline on capacity allocation and congestion management EU 2015/1222 governs how day-ahead and intraday markets operate. As an example CACM states that all CCR's have to develop and implement a methodology for capacity calculation on interconnectors. COBRACable will be subject to this methodology for the relevant CCR when it is developed and approved.

15.2 Guideline on Forward Capacity Allocation (FCA)

The guideline on forward capacity allocation EU 2016/1719 primarily governs how Long Term Transmission Rights are sold. As an example Harmonised Allocation Rules (HAR) has been developed under the FCA code which governs rules around e.g. settlement, guarantee provision, and bid submission. COBRACable will be subject to all methods under FCA when they are developed and approved, however, HAR will already govern the Long Term Transmission Rights sold on COBRACable from the first auction.

15.3 Guideline on Electricity Balancing (GLEB)

The guideline on electricity balancing EU2017/2195 requires common markets for ancillary services. As an example it requires cross-border activation of aFRR and mFRR. Energinet and TenneT already participate in several pilot-projects for example Picasso and MARI.

The COBRACable cannot supply aFRR or mFRR but should rather be regarded as an additional border for transport of activated aFRR and mFRR. Energinet and TenneT expect to be able to utilise COBRACable for this purpose.

15.4 Guideline on System Operation (SOGL)

The guideline on transmission system operation EU 2017/1485 sets forth requirement for operation of transmission lines in which COBRACable will be a part of the Danish and the Dutch transmission system. There are no direct requirements for COBRACable in the guideline but COBRACable will have an impact on the transmission system in Denmark, Germany and The Netherlands.

TenneT both in Germany and The Netherlands together with Energinet are aware of the operational challenges and are cooperating to solve these such that the rules in SOGL are followed. This entails a cooperation regarding a trip of COBRACable. In the event of a trip of COBRACable the power will flow through the AC-grid in Denmark, Northern Germany and The Netherlands. Energinet and TenneT (NL and DE) have assessed the consequences and necessary initiatives to solve issues in collaboration.

In SOGL there is a requirement to coordinate maintenance where Energinet and TenneT have agreed to have yearly operational meetings where among other things maintenance can be coordinated.

15.5 Network code on requirements for grid connection of high voltage direct current systems and direct current-connected power park modules

The network code on HVDC-links EU 2016/1447 does not apply to COBRACable according to article 4 with the exception of articles 26, 31, 33 and 50.

When the purchasing contracts for the HVDC Converters for COBRACable were entered into it was with the requirements posted at the time. When COBRACable goes into operation in 2019 it must be proven that the interconnector fulfils the requirements stated in articles 26, 31, 33 and 50.

16. Further information

If further information about the market setup for COBRACable is needed, please contact Randi Kristiansen rki@energinet.dk