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Connecting Large Quantities of Offshore Wind – Offshore Bidding Zones? Webinar

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31-1-2023



Introduction

- > Background:
- > NSCOGI & NSEC (2013-2015)
- > PROMOTioN & PhD (2016-2020)
- > Spin-off and new projects (after 2020)

- > Concrete recent publication (open access)
<https://research.rug.nl/en/publications/dividing-the-sea-into-small-bidding-zones-the-legal-challenges-of>



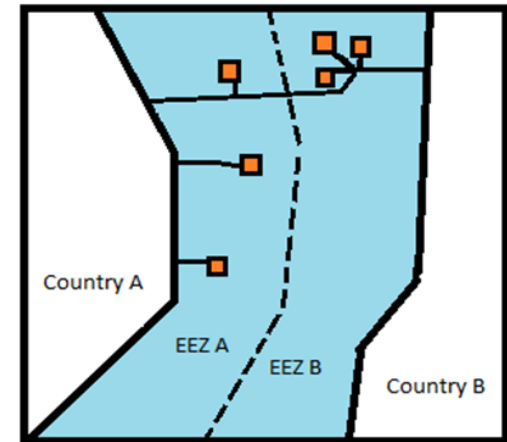
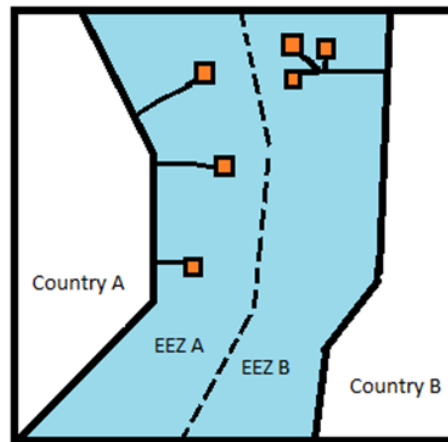
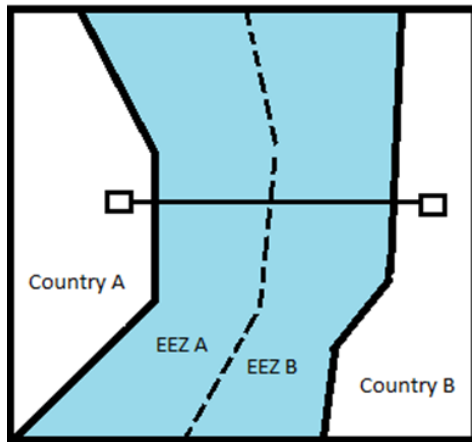
EU/National Targets

- > 15% interconnection in 2030
- > Large amounts of offshore wind:
 - DK/DE/NL/BE:
60GW in 2030, 300GW in 2050
 - UK: MoU with NSEC, 50GW by 2030 and interconnection cap. from 8,4GW to 18GW
 - Norway 30 GW by 2040



Connecting Offshore Wind

- > From radial to clustered, hybrid assets,
- > And thereafter...offshore grid? Energy islands?





Hybrid Projects

> Advantages

- Added (societal) value from interconnection capacity
- Higher use percentage = more efficiency
- Less need for cables if they are combined = less environmental impact
- When there is a fault on the line, the wind energy is not “lost” but can be exported to the other side
- Sometimes, the wind capacity is more than the onshore grid can handle, hybrid connections help to spread the wind energy – example Bornholm



Hybrid Projects

> Disadvantages

- More complexity, both technical and planning
- Dependency on another country/TSO/NRA for deciding on cable capacity, regulatory provisions etc
- Legal uncertainties
- More coordination needed, more coverage of risks

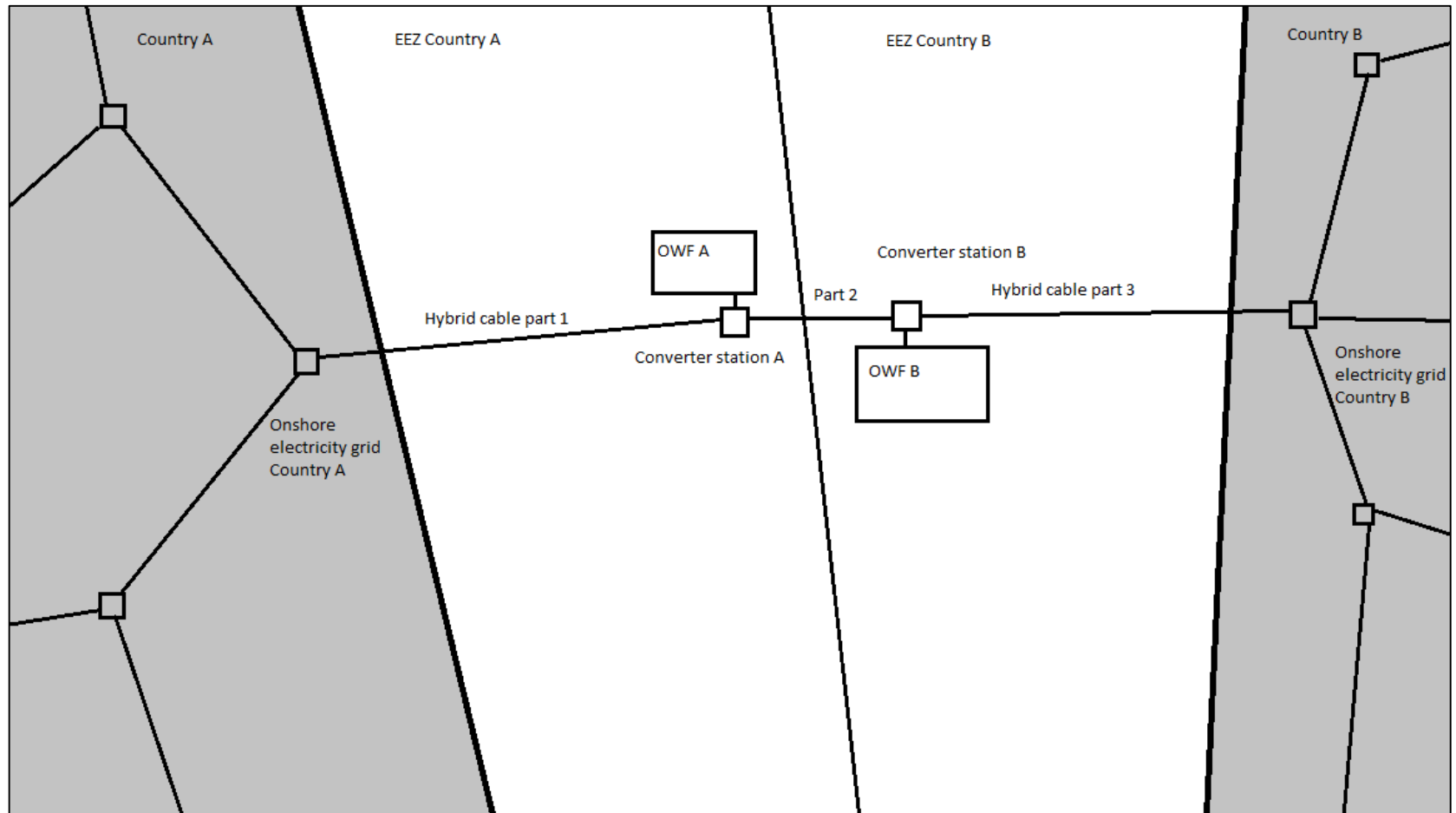


Legal Aspects

- > Definition interconnector
- > ‘equipment used to link electricity systems’ (E-Directive)
- > ‘a transmission line which crosses or spans a border between Member States and which connects the national transmission systems of the Member States’ (E-Regulation)
- > Hybrid connections not foreseen in definition, only recital 66 E-Reg gives a hint



Possible Connection





E-Regulation: Capacity

- > 16 (4) The maximum level of capacity of the interconnections and the transmission networks affected by cross-border capacity shall be made available to market participants complying with the safety standards of secure network operation.
- > 16(8). Transmission system operators shall not limit the volume of interconnection capacity (...) as a means of solving congestion inside their own bidding zone or as a means of managing flows resulting from transactions internal to bidding zones. (...) this paragraph shall be considered to be complied with where the following minimum levels of available capacity for cross-zonal trade are reached: -> **70%**



So...

- > TSO cannot reserve capacity specifically for wind energy
- > Wind energy has to take part in the 'normal market' like other market participants
- > This is a difference compared to onshore wind farms and other generators



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Three Options



Exemptions and Derogations

- Limited Period
- Separate approval process by EC each time
- Not a problem for an individual project but it becomes a chaos if the legal status of each interconnector is different
- Is used for KFCGS although one can criticise whether this is really a “small, isolated system”...



Changing EU Law (E-Reg)

- > Only when there is a window of opportunity
- > Long duration, no solution for the short term
 - IJmuiden Ver
 - Nautilus
 - ...?
- > But does allow for a tailormade solution also for future electricity grids offshore



Offshore Bidding Zones

Status Quo

Bidding in
 "home state"

Price = where
 supply and
 demand meet

Offshore Bidding Zone

Bidding in hub
 with one/a
 few OWFs

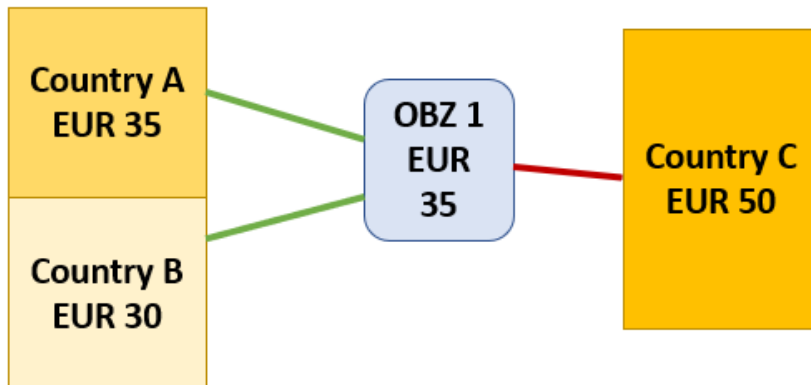
No/hardly any
 demand?!



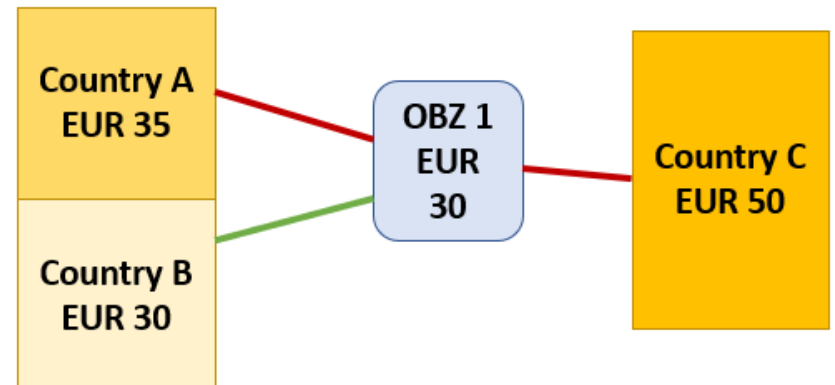
How to form a price?

- > Still marginal pricing based on available capacity
- > If multiple connections, the price of the OBZ is the highest-priced country to which interconnection capacity is still available

Situation 1: no more capacity available to C;
OBZ takes price of next highest neighbouring zone (A)

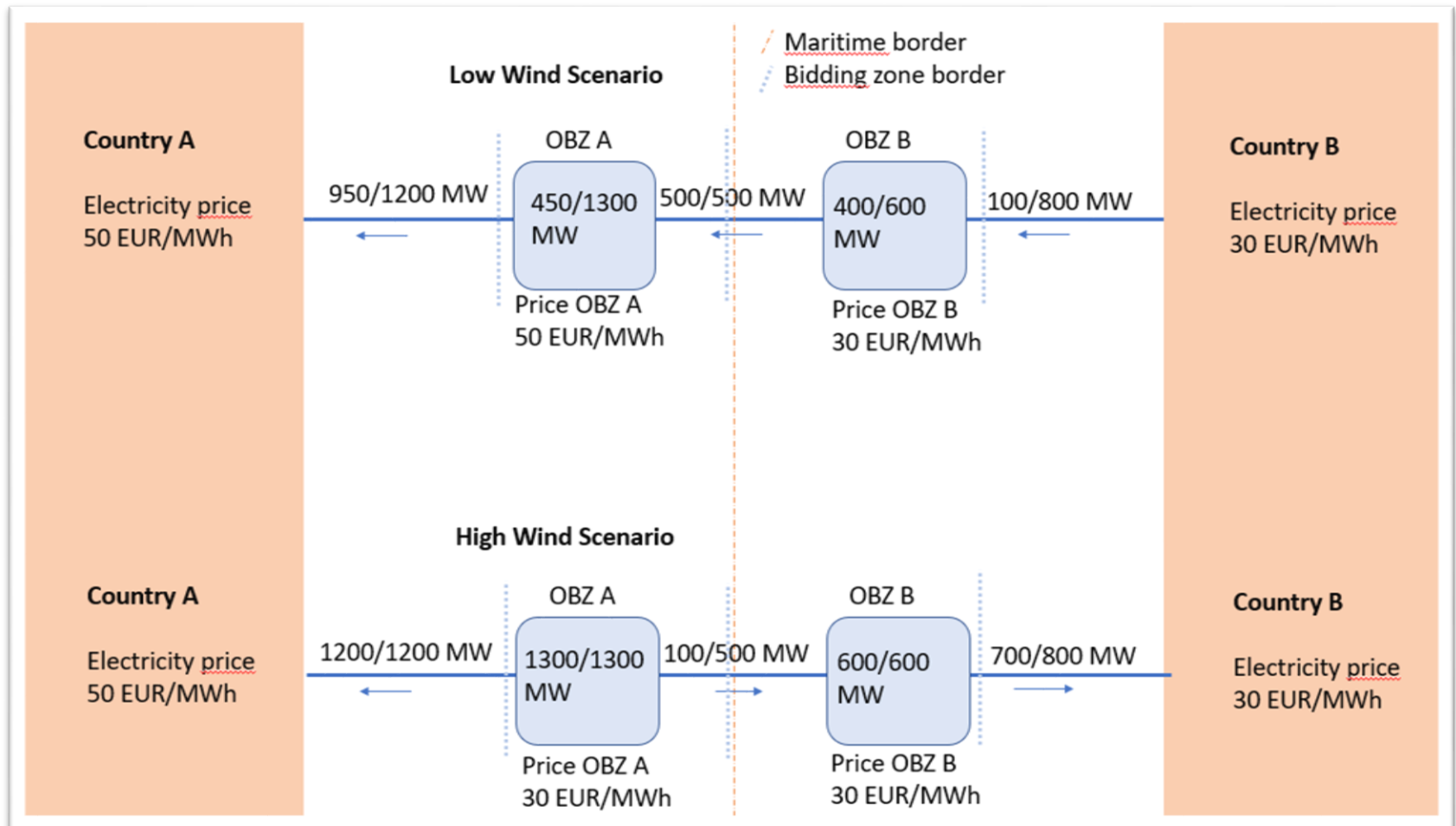


Situation 2: no more capacity available to A and C;
OBZ takes price of remaining neighbouring zone (B)





High/Low Wind Scenario





Important Consequence

- > Different income distribution
- > Interconnector owner gains: more congestion rent
- > OWF developer loses: lower prices
- > Cannot be repaired through a direct transfer
- > Subsidy instruments, other benefits



Extra Subsidy Needed?

- > No, can be part of existing scheme
- > Represents value to build OWF somewhere
- > But important to make the market model fit with needs of OWF developers, also in terms of balancing and intraday market development, liquidity etc ([Engie Study](#) for the EC)

Link: https://energy.ec.europa.eu/system/files/2022-09/Congestion%20offshore%20BZ.ENGIE%20Impact.FinalReport_topublish.pdf



Legal Perspective

- > Fits within E-Reg: bidding zones are supposed to reflect areas where there is no structural congestion
- > Hybrid cable without OBZ will get structural congestion
- > Multiple Bidding Zones within country border is already possible (DK, NO, SE, IT)
- > Bidding Zone **Review?** Or lighter procedure



Other Benefits

- › Economic Efficiency
- › Better signals to the market: local scarcity/surplus is priced
- › Incentive for investment in energy storage and conversion
- › Incentive for more innovation



Other Elements / Issues

- > Need to cover price risk on forwards market, different types of FTRs, changes to EU Network Codes
- > Balancing Market: Not Sufficient Liquidity in offshore hubs
- > When TSO limits the capacity of the interconnector, OWF loses. ENGIE suggests "transmission access guarantee (pricexcapacity)



Conclusion

- > Current EU law is not really fitting for hybrid connections
- > Offshore Bidding Zones fits well within EU law
- > But needs to be carefully researched how this can be implemented in a way that is acceptable to all parties



Questions? Remarks?

- > What do you consider to be large legal challenges to connecting offshore wind?
- > Technical/economic/political challenges?



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