



Hi Thomas,

In response to Energinet's "METHODOLOGY FOR TECHNICAL REQUIREMENTS FOR AND NEW PROCUREMENT METHOD OF FAST FREQUENCY RESERVE (FFR) IN DK2" consultation, Vestas welcomes Energinet's proposal for an hourly procurement using the D-2 forecast as this will allow technologies with long planning horizons to participate – an every VRE trusting their forecasts as well. Further to this, Vestas would also like to propose that:

- The additional volume should be procured during the day (intraday) e.g. through an auction every 3-4 hours. This will allow suppliers – especially VRE – to adjust their bidding based on updated forecasts minimizing any error margins needed.
- Additionally, it should be possible to give a negative capacity bid to the auctions i.e. buying back your obligation from the D-2 timeframe, similarly to what is being proposed for the monthly auctions to "free" capacity based on D-2 FFR requirements. This provides a hedging opportunity for those suppliers that do not have a sufficiently large and diversified portfolio to mitigate the risk of non-delivery due to technical errors, forecast inaccuracy etc.

For the suppliers, this design gives high flexibility in the bidding and operation of their assets and, if marginal pricing is used as proposed, it should also theoretically give the lowest socioeconomic costs.

Vestas sees a benefit for the market if the Wind Park owners/operators have the possibility for to bid in the service, as this is such a largely available resource in Denmark. From a technical perspective, the provision of the FFR product from wind would be mainly possible in three manners:

- Wind curtailment (spill) – this methodology is heavily reliant on wind availability and, thus, forecast to be possible to participate in the Balancing Market. For this methodology, a shorter timeframe would be required for lower error margins as such an intraday procurement market would be preferred;
- Storage + wind – this methodology would be dependent on what requirements are in place for storage but in any case will add a heavy cost to the service. Forecasting errors and bidding time horizons may not be as critical in such cases. It should be noted that current installed storage volumes in Denmark might not be enough to supply the FFR service;
- Emulated (Synthetic) inertia - this methodology would not require additional costly equipment nor would it be subject to forecasting errors as much – as long as there is a minimum amount of power production, the turbines should be able to provide this service.

Vestas sees the possibility to access the wind resource for the FFR service, in particular making use of emulated inertia for the FFR service, as a highly cost effective way to secure the FFR gaps in the forecast. Unfortunately, under the current technical implementation of the FFR requirements (reference [8] in the document) we see it as not permitting the provision of the service as an emulated inertia alone (which would be the favourable option from a market design point of view), but would either be dependent on a shorter bidding time horizon (spilling wind which carries a cost) or on costly equipment upgrade. As such, Vestas would welcome a review to the technical implementation of the FFR product in Denmark to support lower bid prices in the auctions.

Hopefully this response to the consultation is not too late and the above can still be taken into consideration.

Sincerely yours / Med venlig hilsen

**Federico Rueda Londono**  
Electrical Specialist  
TSM NCE  
Power Solutions

**Vestas Wind Systems A/S**

M: +45 4062 6109

[FERLO@vestas.com](mailto:FERLO@vestas.com)

<http://www.vestas.com>



---

Company reg. name: Vestas Wind Technology A/S

This e-mail is subject to our e-mail disclaimer statement.

Please refer to [www.vestas.com/legal/notice](http://www.vestas.com/legal/notice)

If you have received this e-mail in error please contact the sender.

Vestas will as part of your communication, interaction and business relationship with us collect and process personal data about you.

You can read more about Vestas' collection and processing of your personal data and your rights as a data subject in our [Privacy Policy](#).