ESIG Webinar: IEA Wind Task 25 Final Report	
Question	**Answer**
For future, is curtailment correct metric? Shouldn't it be based on value created by wind energy? What is difference between small value and curtailment?	Agreed. One way to think of this is as economic curtailment, where curtailment (driven by the overbuilding of wind and solar) can be part of the overall system-wide least-cost approach. With the cost of wind and solar continuing to decline, the lost opportunity of selling some of that energy for some time periods becomes less significant, and it allows the system to maximize its value at other times. Curtailment can be a helpful metric in indicating a lack of system flexibility, but as mentioned, it can also help by providing balancing support. In addition, there is an increasing interest in cross-sectoral application that can utilize that otherwise-curtailed energy. Involuntary curtailment (without opportunity to use for services) still seems to be a relevant metric to follow. As grid support services will be a limited market, will not be possible for all VG generators to benefit from that. On the other hand, letting part of VG to offer the services gives room for others to generate without curtailments.
Any comments on the role that IEEE P2800 std. for IBR connection at transmission level & P1547-2018 for distribution level will help with stability problems?	Given that the standards aim to raise the minimum requirements for IBRs in terms of frequency/voltage/phase jump ride through capability, P/Q control, etc. then the short answer to the question is yes, since barriers can be pushed further away, but how these new capabilities are best applied and co-ordinated across a system also needs to be thought through.
Are the low SC levels really reason to concern? Don't we see increasing levels at many instances due to an ongoing meshing of the grid?	Ongoing grid reinforcments will help a lot - and they are partly made to mitigate low SC levels. There may be some parts of the grid that will stay or become low SC, this needs to be monitored, and use of grid forming inverters is one mitigation option
What did Task 25 find to be the typical range of capacity values for wind power? Can you summarize how the capacity values were determined?	We have produced summary graphs of capacity value from different studies in previous reports. The capacity value often starts close to average capacity factor of the (system wide) wind power when share of wind is low (20-35%). In some cases it is lower/higher to start with, depending on whether there are correlations to high load situations and wind resource. All regions see a declining curve for capacity value as the share of wind increases, and this is more pronounced if the area is small (not enough diversity for the added wind capacity).

What areas will IEA Task 25 focus on in 2022-23? Any work planned on large scale behind the meter solar, for example?	Main focus areas are Balancing, Planning, Stability and Markets, all looking towards 100% RES systems. We look mainly at the transmission system/operator level power system issues, but these are impacted by distributed generation, and energy system coupling (power to heat, power to transport, power to X for industry).
Cost recovery studies are conducted to see if the wind could recover the cost w/ adequate ROI under 100% (close to 100%) wind scenario in the market framework?	In section 6.5.4 of the report there is an example from Korpås & Botterud showing cost recovery for variable energy and storage units in an ideal market.
Does the Task 25 report have any recent data on wind forecast MAE vs. hour ahead?	The Spanish example shown shows MAE for the different time horizons, from 2020 as the latest development. There is also example on the aggregation benefit for wind from Germany. See also Forecasting Task of IEA Wind https://iea-wind.org/task-36/
Did Task 25 look into the MAE in hour ahead wind energy forecast as a function of the % change in wind energy the next hour? Bigger change = more error.	German study presented in the report shows how the MAE is larger for storm situations, and in previous reports /fact sheets also a German study is referred to where it was shown that the more variability there is in the wind generation time series, the larger the MAE is (Jan Dobschinski, Fraunhofer IEE)
Faster markets would help wind power capture more value, but will that also increase the need for reserves allocated day ahead?	Faster markets have shown to reduce the need for operating reserve, as market dispatch updated more frequently will reduce imbalances.
Is Task 25 continuing, or will it come to a close now that the report has been published?	The report is closing the 2018-20 phase of Task 25, we are still working with a 2021-24 phase. Our main aim is to update the Recommended Practices for wind/solar integration studies (this is for methodology), as well as fact sheets. Probably the summary report with results and experience will not be updated anymore
Hi Hannele, does Natural Gas Gen count as clean/green Energy? Is it realistic to have All Green Power in Europe by 2030/2040? Thanks	natural gas does not count for green energy - there is discussion in EU whether to include nuclear and natural gas in the taxonomy for clean energy (up until for example year 2030 for natural gas) where the aim is to list technologies that are ok to invest in, but especially natural gas addition to that list is highly debated. EU countries all make scenarios for net zero emissions by 2050, some have more ambitious goals like FInland already 2035. According to the first assessments this would mean power sector to have zero emissions (sinks from forests needed to cover for industry/agriculture emissions), and finally power sector even negative emissions (with BECC carbon capture from biomass).

Does that mean only power electronics inverter interfaced resource? Is syn. condenser considered as grid-forming resource?	Studies were assuming battery/wind/PV/etc. inputs as power electronics inverter interfaced reources to investigate the viability of a non-synchronous system. Synchronous condensers were not considered, but, of course, they could have a place in future systems.
DO you believe that GFI´s at transmission level will be enough to provide also the fault levels at the distribution level?	Initial study assumed GFIs located at transmission system, in order that only one "variable" was changing, i.e. switching from synchronous to non-synchronous sources, making it more straightforward to study the impacts. In reality, inverters will appear at various voltage levels, on both the transmission and distribution network. It remains unclear how grid-forming capability (over grid-following) capability will be incentivised but non-transmission assets are likely.
If you count on ties with neighbors for Resource Adequacy, how do you make sure that everyone is not using the same resources in those neighbors?	For multi-area methods, there are several possible approaches. Either assume lower availability for resources from neighbouring areas, or preferably model the whole area with a joint loss of load probability. In addition, some resource adequacy models can include transmission outages to explicitly capture the impact of ties not being available to transfer energy across region boundaries.