



Far Future Scenario

Olimpo Anaya-Lara, University of Strathclyde
Harald Svendsen, SINTEF Energy
Edwin Wiggelinkhuizen, ECN
Gerard Schepers, ECN

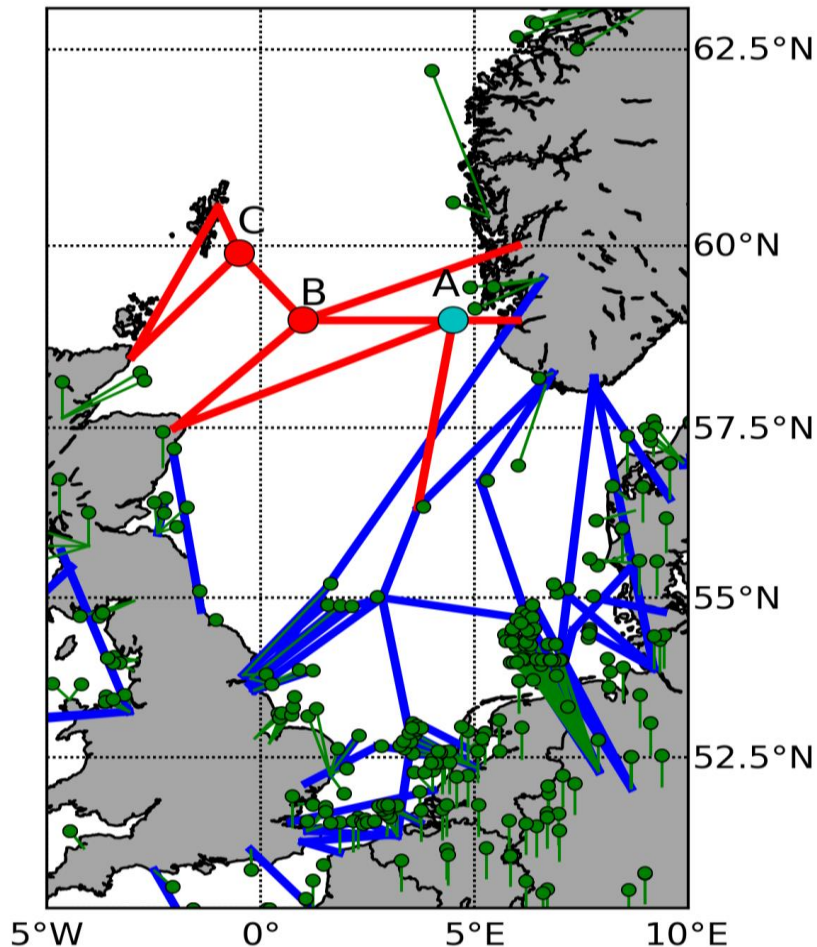


Support by



- Far Future Scenario description
- Assessing grid code compliance
- Results
- Conclusions

Far Future Scenario description

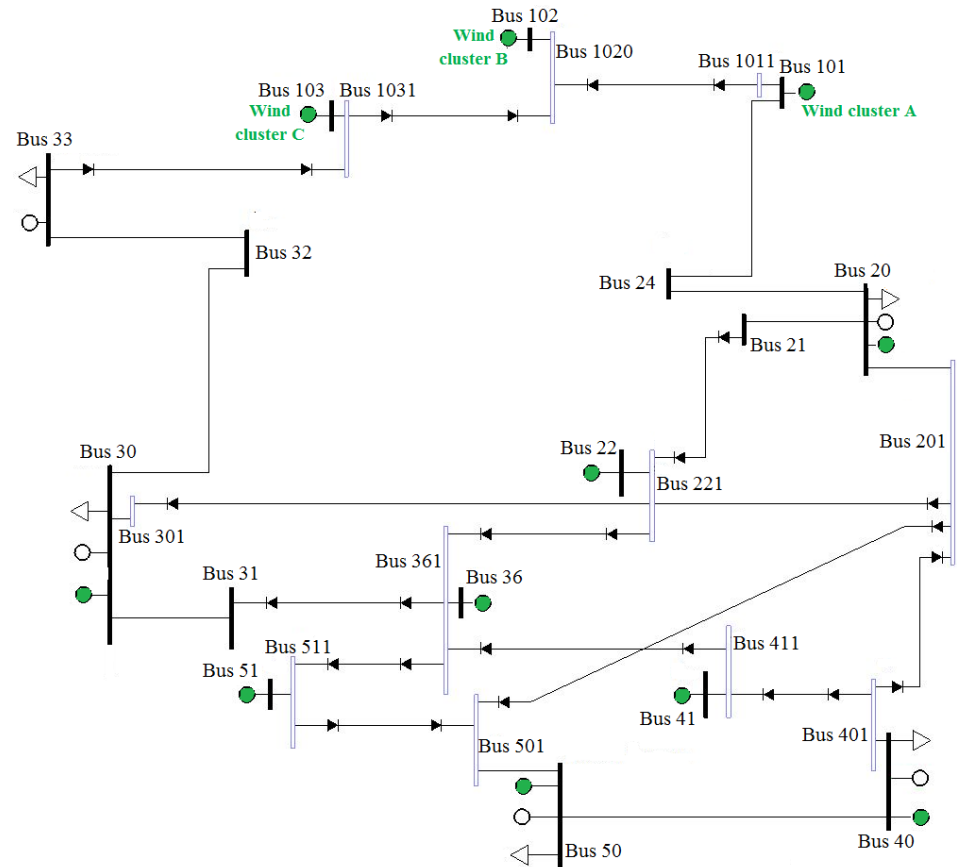


- It has been designed to demonstrate the usefulness of DTOC for long-term, strategic planning.
- It reflects a likely future situation with a large number of existing offshore wind farms, a pre-existing offshore grid, new electrical transmission technologies and floating wind turbines.
- 10-MW Full Converter wind turbines with floating spar platform have been considered.

Assessing grid code compliance

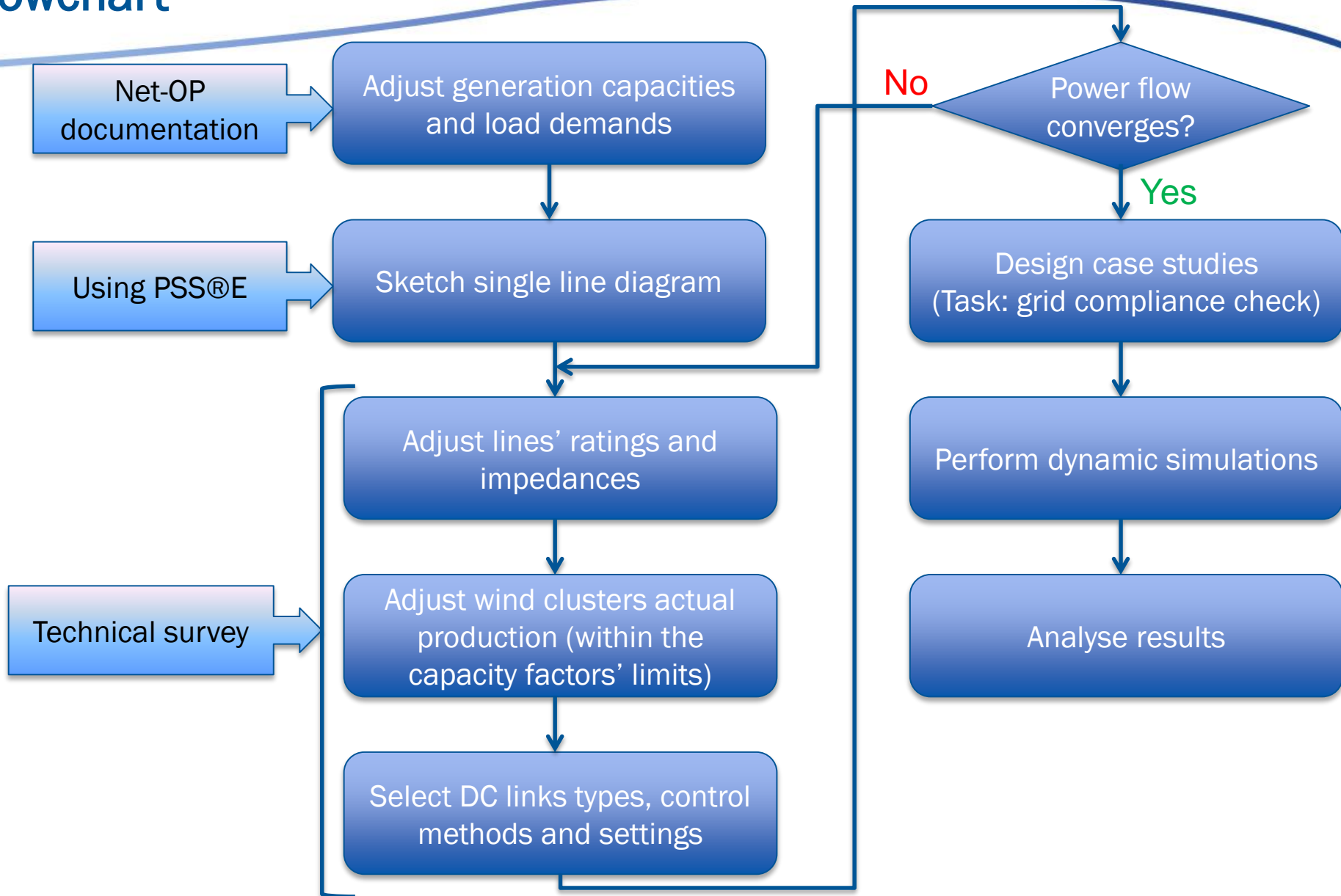
- Net-OP tool provides an optimized configuration to connect the wind farm clusters
- A '*.raw' file is generated to be used by PSS®E
- Simplified single line diagram is created using PSS®E (off-line)

Green generators refer to wind power



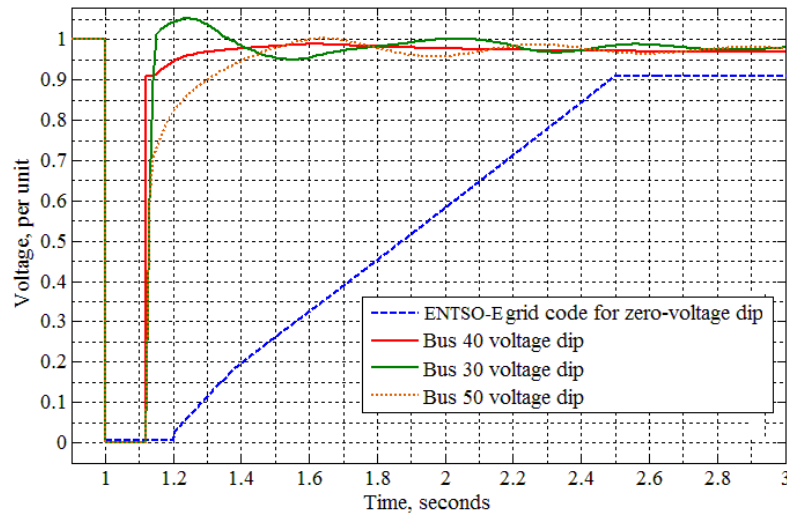
Utilization of Net-OP tool outcome – Procedure

flowchart

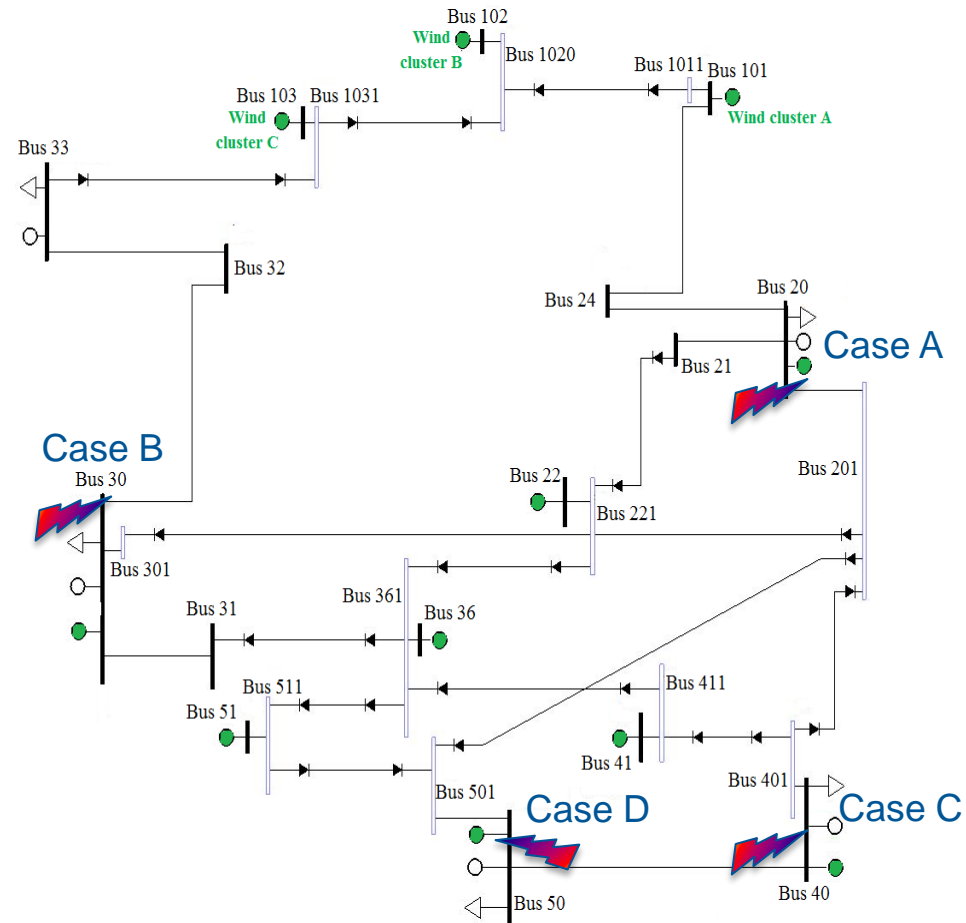


Grid Code compliance verification - example

Name	Faulted bus	Fault type	Clearance duration
Case A	Bus 20	3-phase	120 ms
Case B	Bus 30	3-phase	120 ms
Case C	Bus 40	3-phase	120 ms
Case D	Bus 50	3-phase	120 ms



Cases B, C and D



- The integration of far future wind clusters does not violate the grid codes during voltage dips
- Expert manipulation is currently necessary to link between Net-OP and PSS®E
- Industry parties need to provide real data for some of the components (e.g. future DC links converters)



Thank you very much for your attention

Please, visit us in www.eera-dtoc.eu

