



IEA Wind Task 37

WP 2.2 Reference wind plants

K. Dykes, K. Merz, A. Graham, A. Ning, S. Sanchez Perez-Moreno, and many more.



Why?

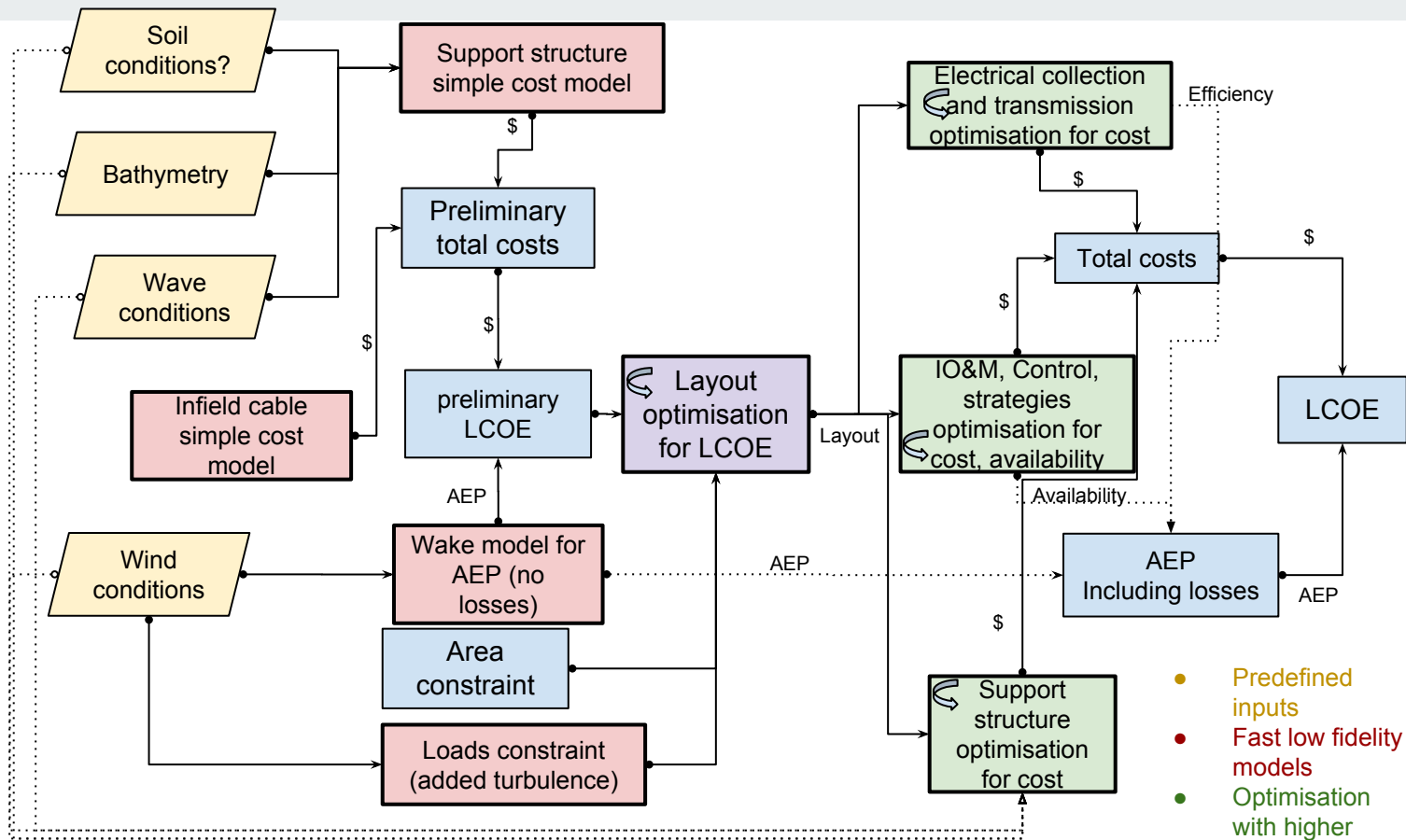
- Very limited access to complete design specifications.
 - Real plants not publicly available, other reference wind plants were designed for specific mono-disciplinary analysis.
- Inconsistent / incomplete design specifications
 - E. g. Site 1 climatology + NREL 5 MW + Site 2 bathymetry + X farm O&M strategy + own electrical system = Frankenstein.
- Baseline that enables the evaluation and comparison of MDAO workflows for wind plant design across research institutions.



What?

- Onshore ~ X MW wind plant (USA)
 - IEA 3.x MW wind turbine
- Offshore ~ 700 MW (North Sea)
 - IEA 10 MW wind turbine
- Design representative of projects under development.
- Consistent site conditions / design of all components.
- Complete specifications for most common disciplines.

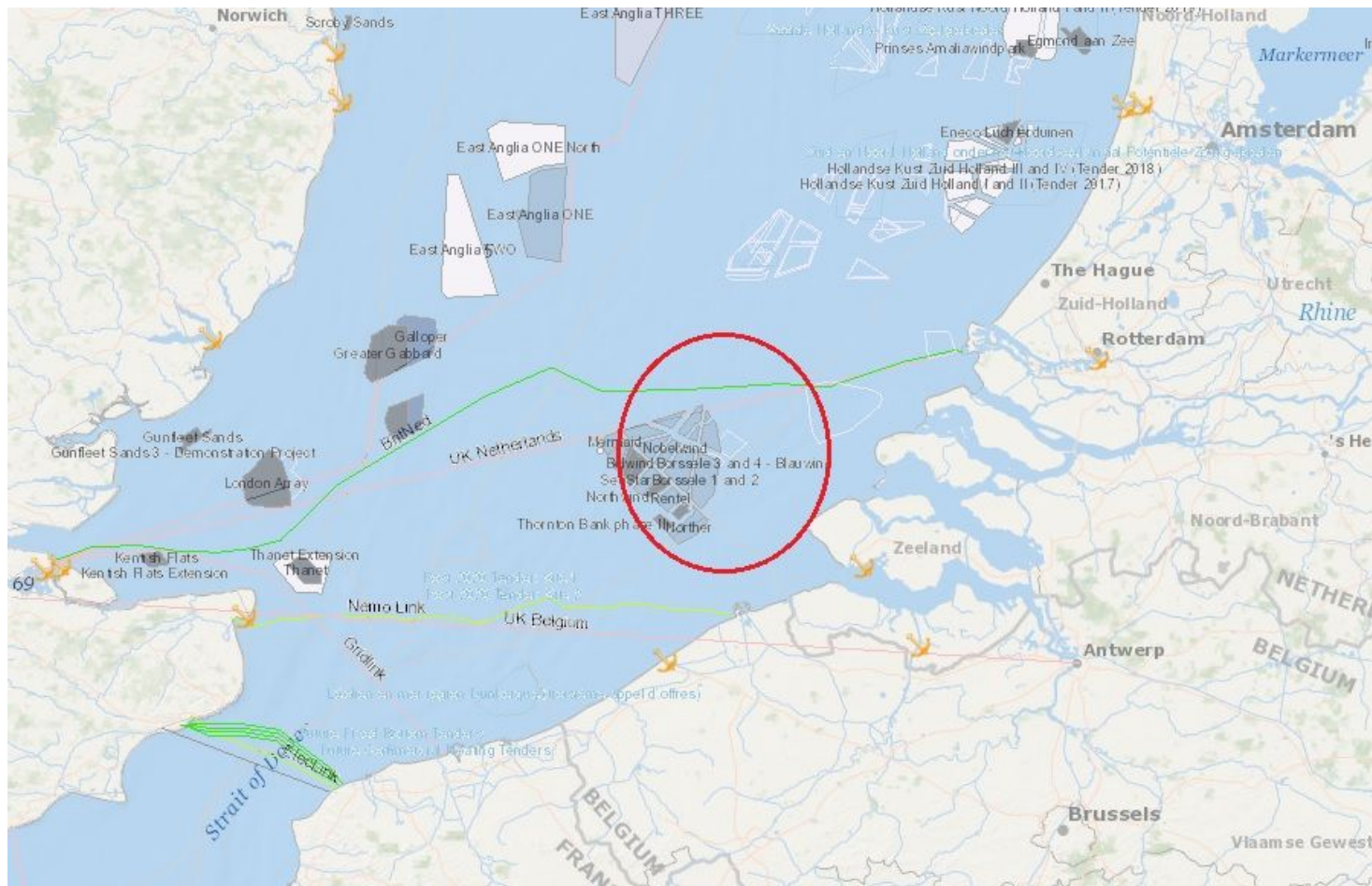
How?



- Predefined inputs
- Fast low fidelity models
- Optimisation with higher fidelity models
- Arithmetic functions

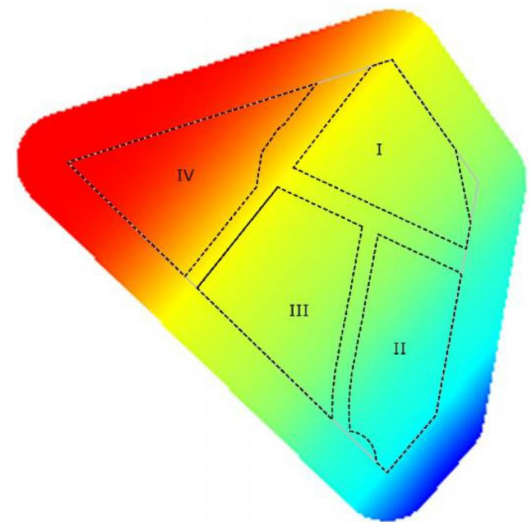
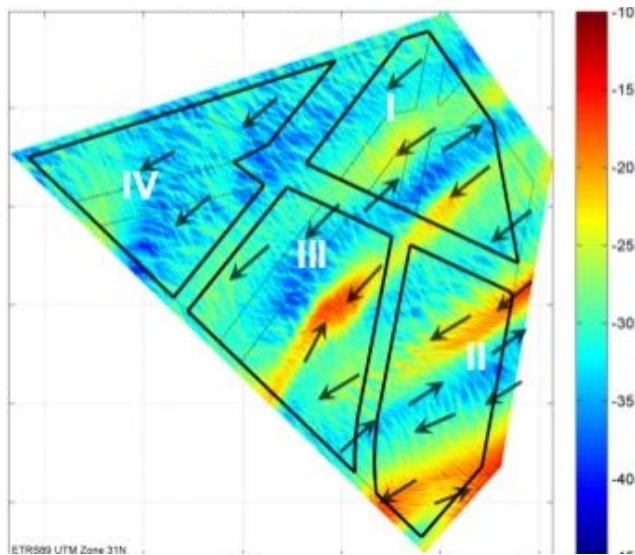
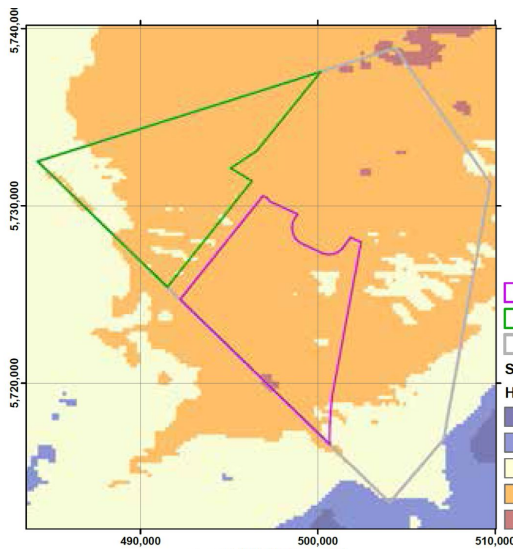


Now



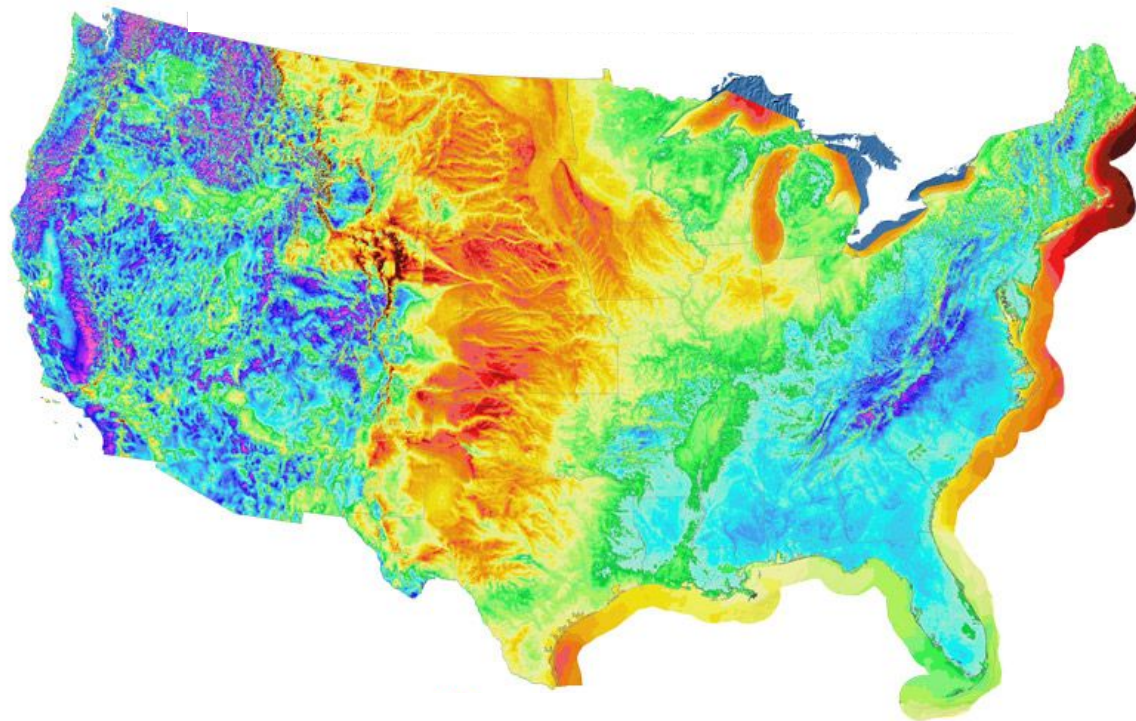


Offshore conditions



WIND RESOURCE OF THE UNITED STATES

Onshore





What's next?

- Decide and fix non-design variables.
- Preliminary / low-fidelity multidisciplinary layout optimisation (regular + irregular) using TU Delft MDAO tool *WINDOW*.
- Detailed high-fidelity sequential design of sub-components.
- Report and release.



Get involved.