**Background**: Design 1500 MW array. Location is approximately 50km off the coast of England.



**Goal**: Find least cost option considering CapEx, Losses, and Availability.

Considering the following:

* Array voltage – 66kV vs 132kV
* Number of Platforms – 1, 2, 3, 4
* Export Voltage – 220kV, 275kV, 400kV (HVDC)
* Reactive Power Compensation (HVAC only): 50:50 or Mid-Point (MP)

**Equipment**:

* 20 MW WTGs
* 2000mm Cable [HVAC]: 460MVA (@220kV), 568MVA (@275kV)

Definitions:

CapEx: Or, Capital Expenditures, is the total cost to develop, design, build, and commission, etc. the wind farm.

Losses: The electrical losses that are inherent in any particular design (e.g., WTG x Quantity – Minus Losses = total Wind Farm Generation).

Availability: Amount of money generated by the wind farm considering planned and un-planned outages (e.g., 8760 h/yr – planned outages – [est] unplanned outages = total Hours of Availability in a Year).