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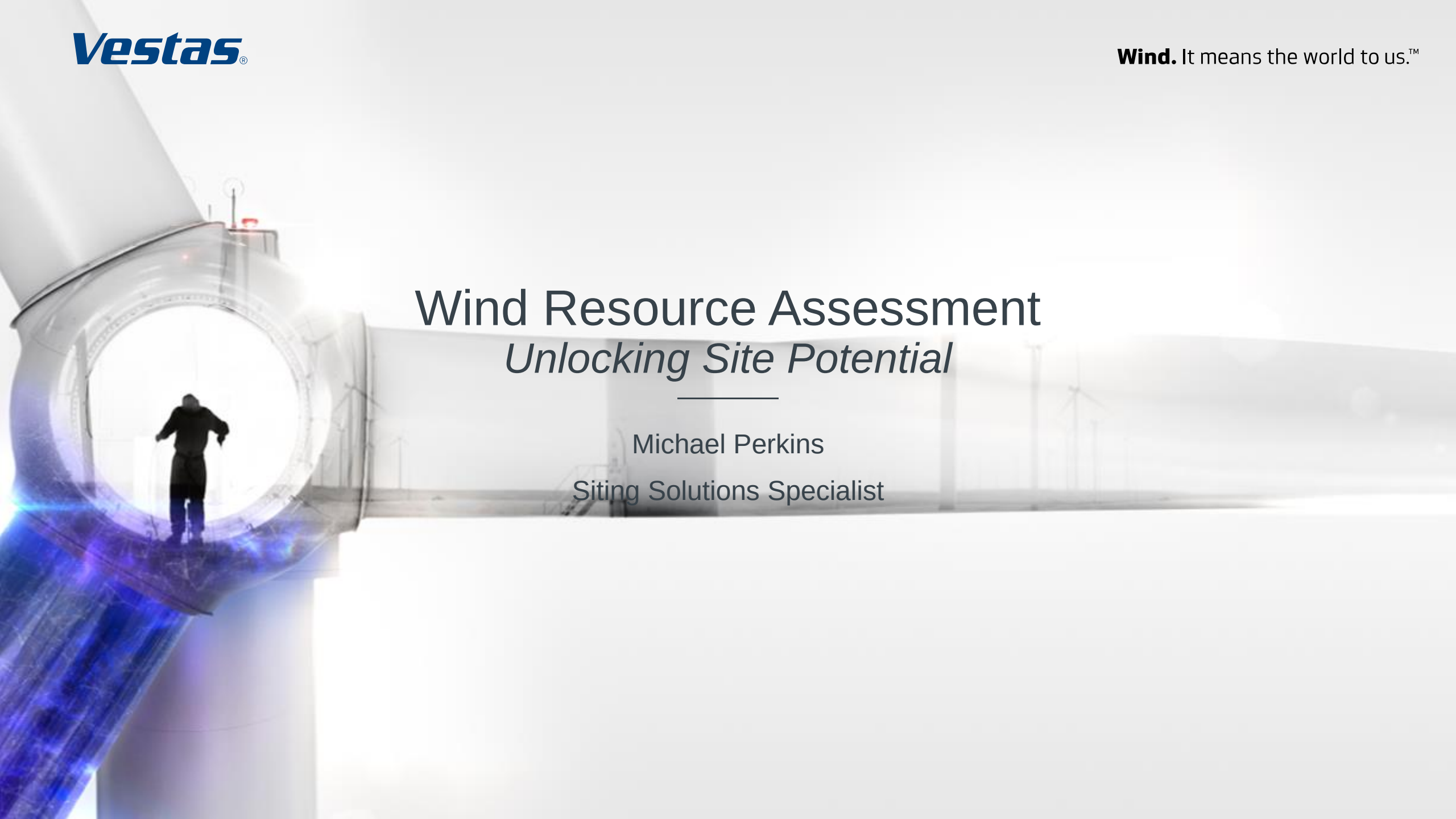
Wind. It means the world to us.™



Wind Resource Assessment

Unlocking Site Potential

Michael Perkins

Siting Solutions Specialist

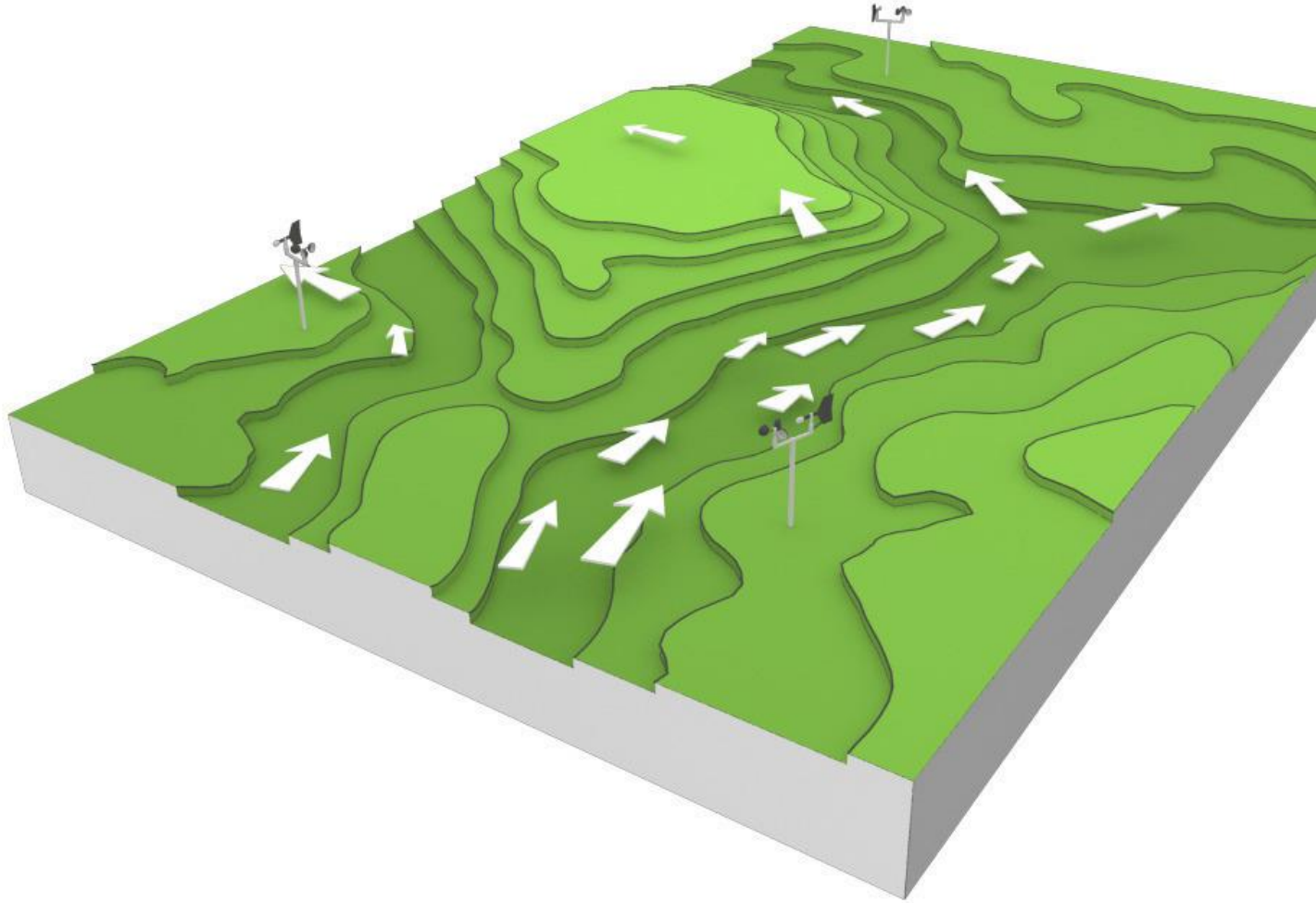
Wind Resource Assessment

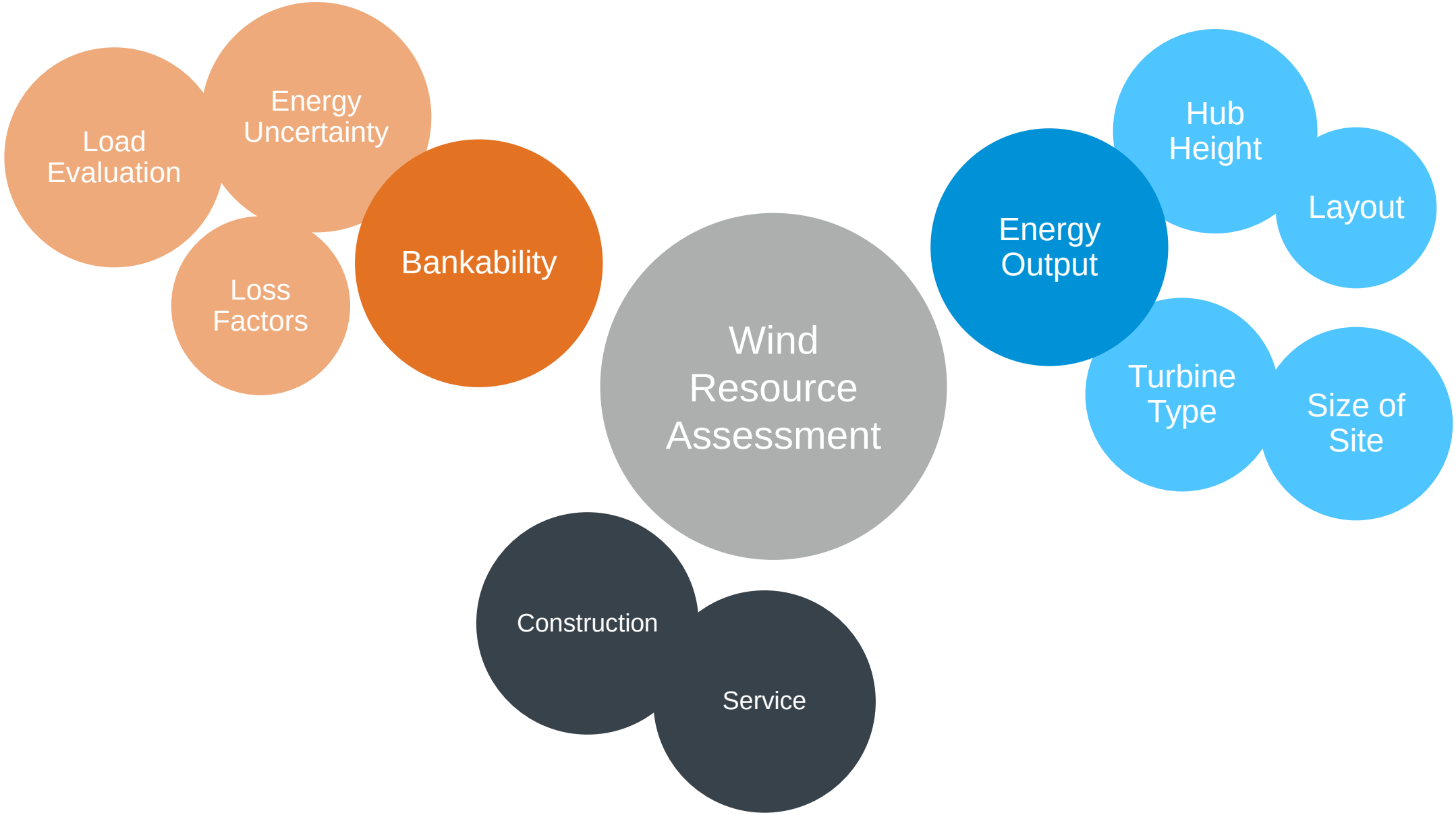
Process to model elements of the climate relevant to generating energy from wind.

Involves:

- Taking site measurements.
- Using models to turn these measurements into climate predictions.
- Predicting wind turbine output and loading under those predicted climatic conditions.

This enables us to design and realise an optimised wind power project.





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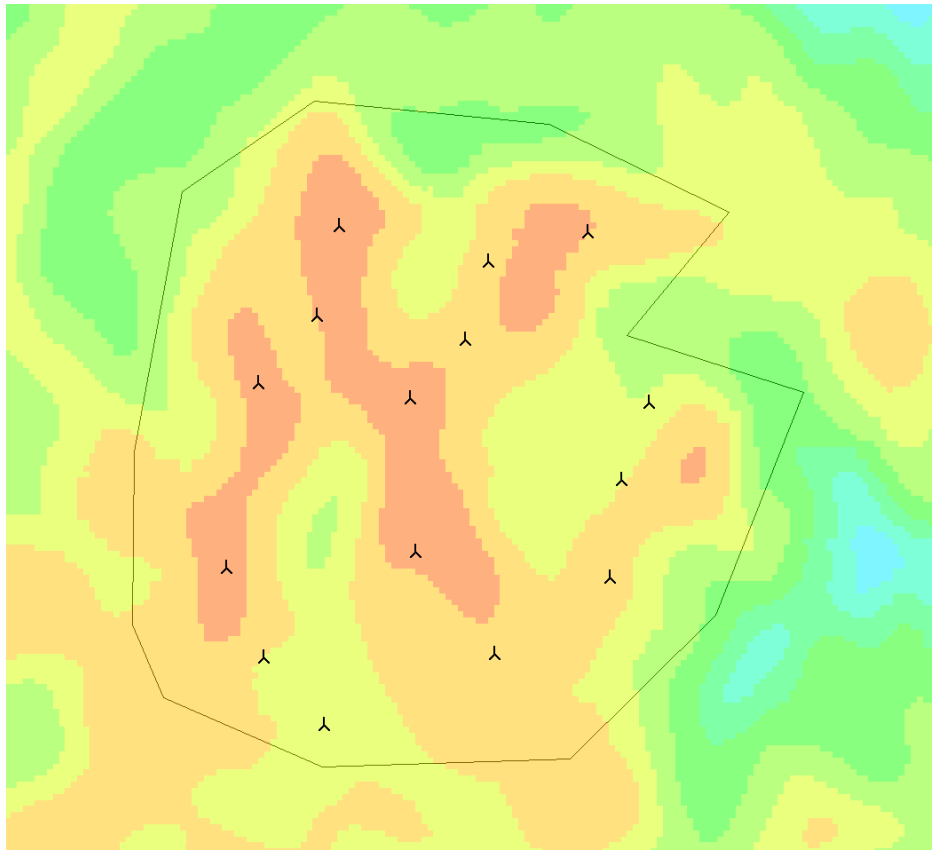
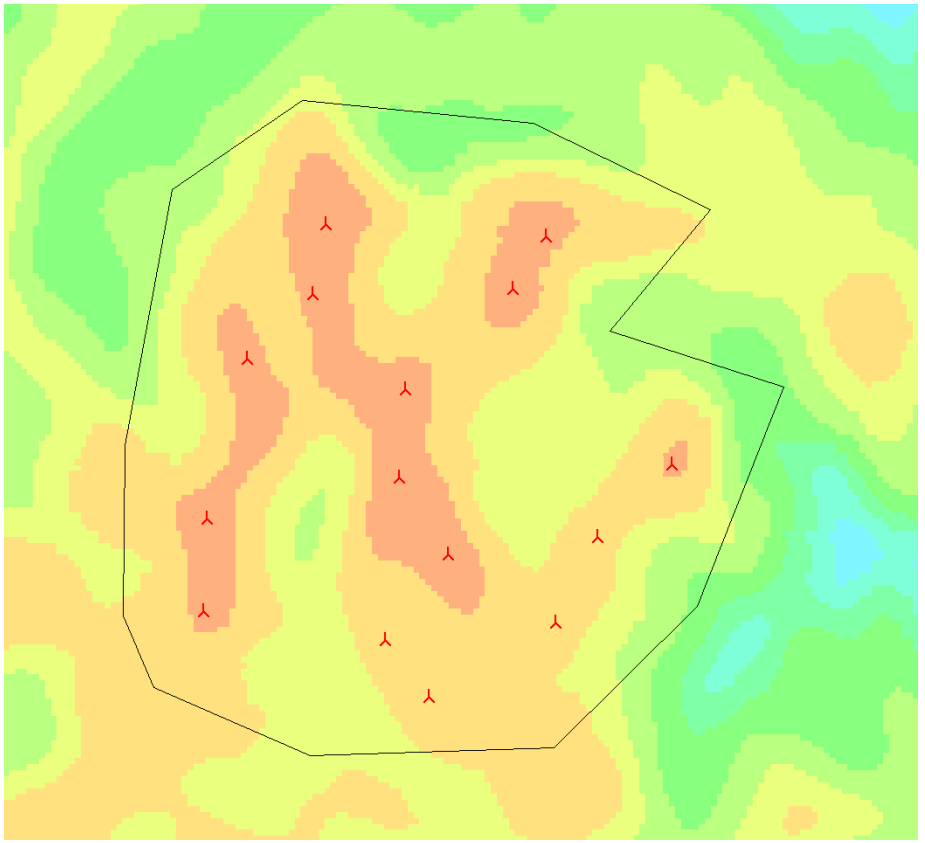
Layout Design

Detailed wind resource analysis allows for layout optimisation.

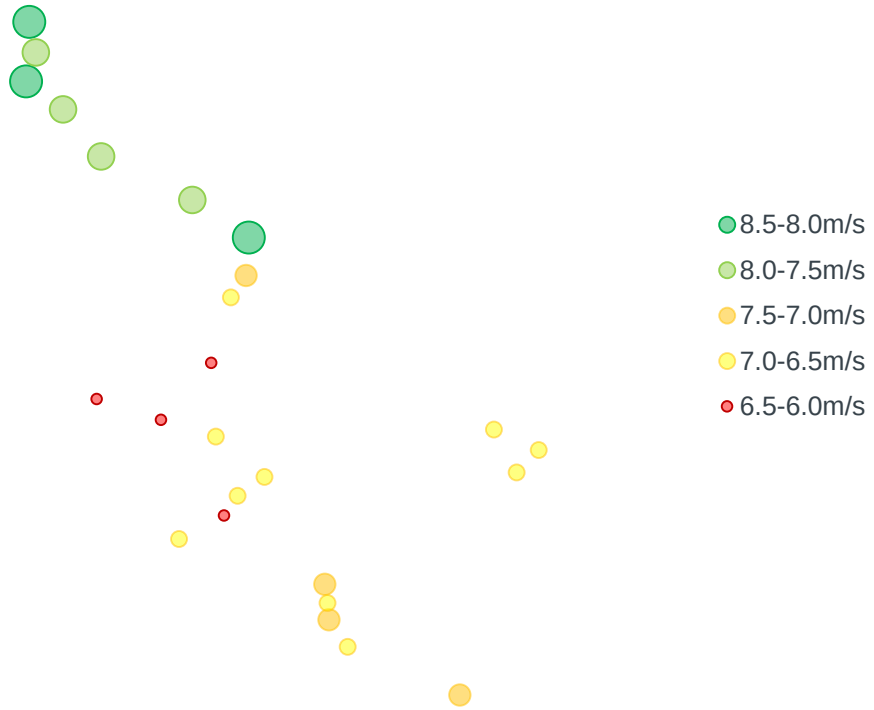


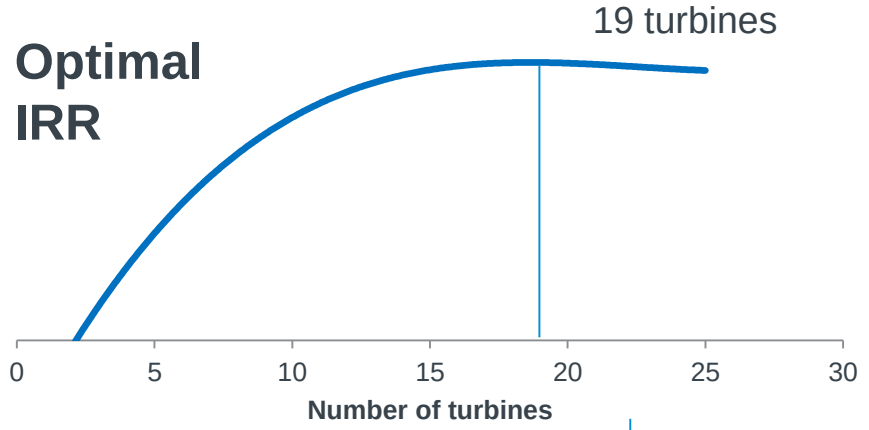
5.5% energy yield improvement

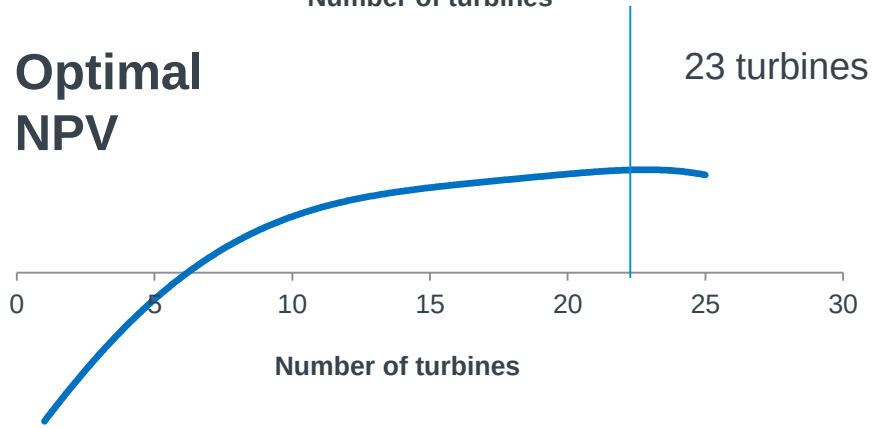


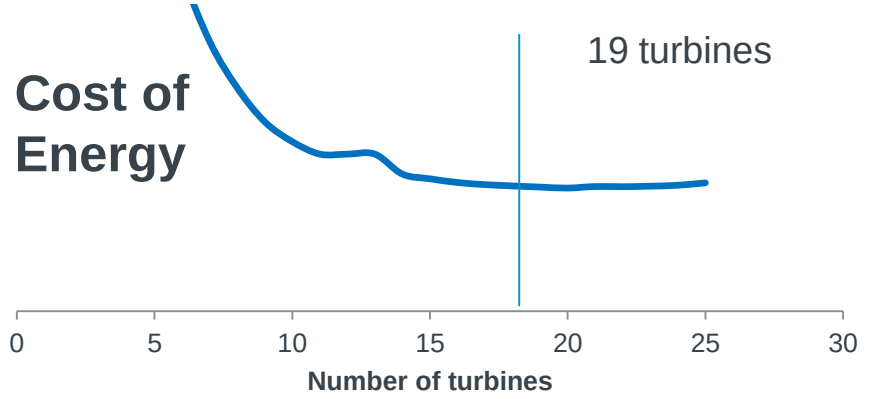
Size of Site

Understanding the pad wise conditions across the site allows optimisation of site size.



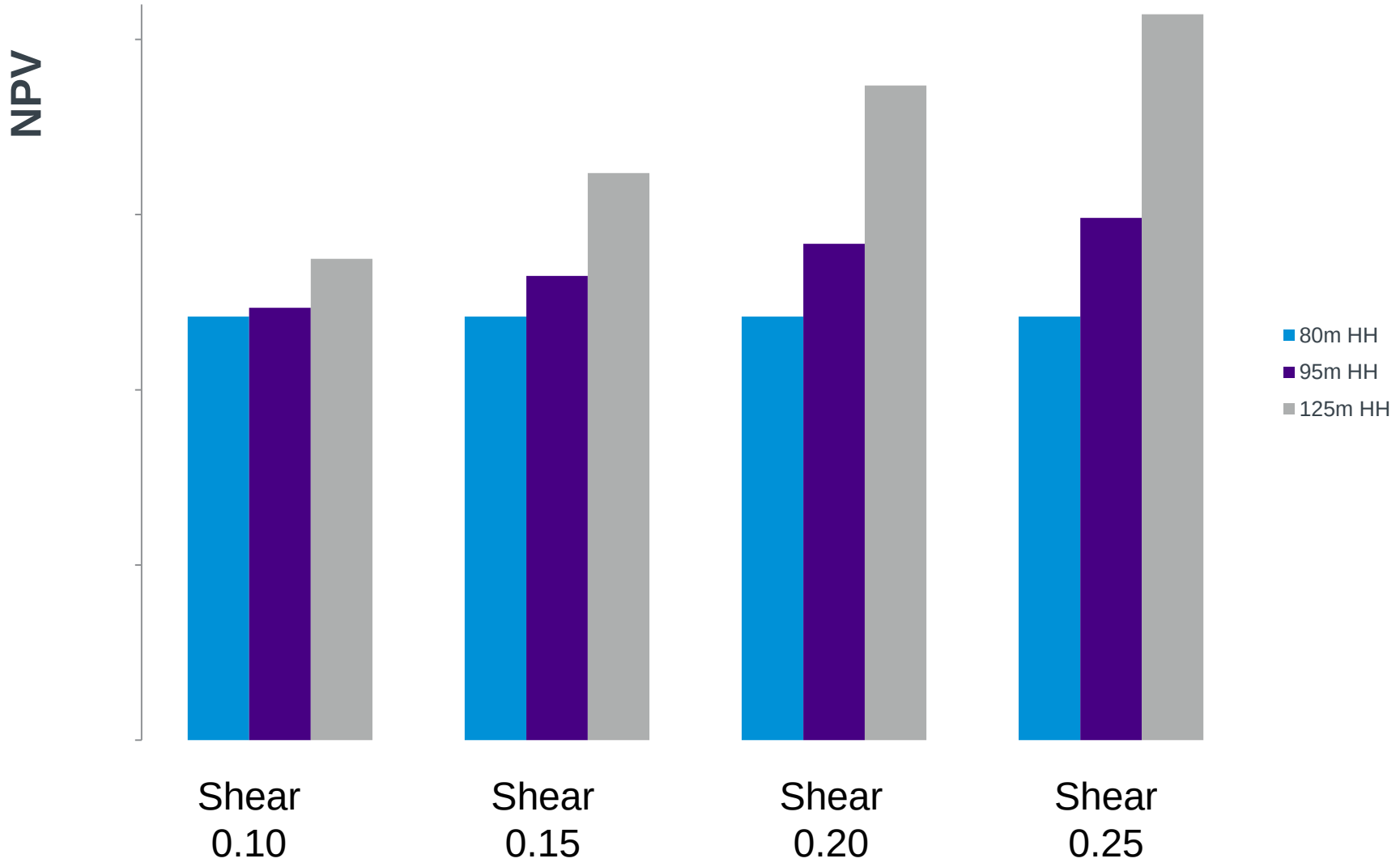






Optimising Hub Height

Analysing the increasing wind potential at higher heights allows customisation of the ideal tower design and height.

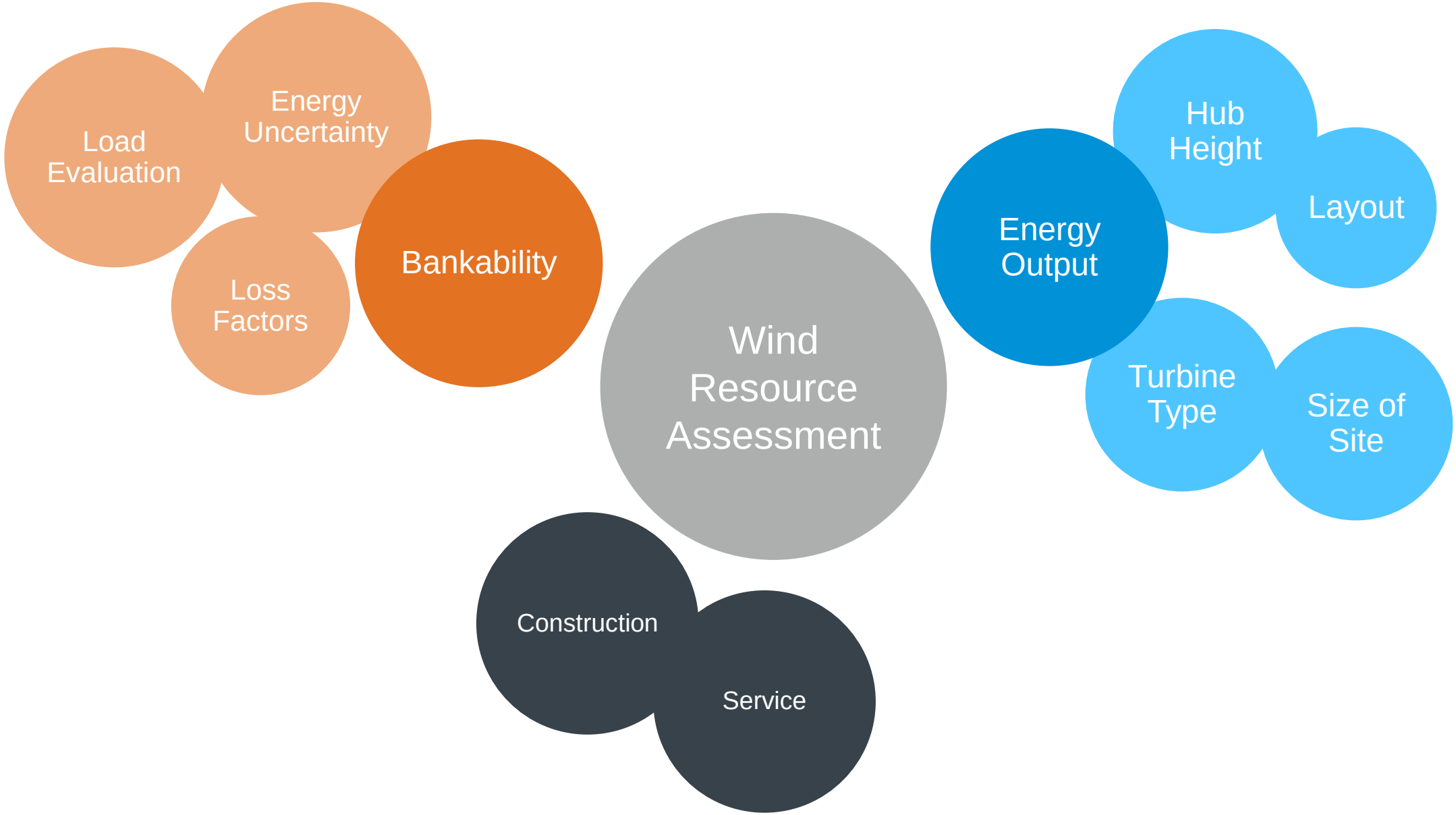


Turbine Selection

Larger capacity turbines with large rotor diameters have been found to be best suited to projects in Vietnam.

- Less land required
- Reduced wake
- Reduced transport costs
- Reduced civil costs
- High efficiency at low to medium wind speeds

- Lowest Cost of Energy



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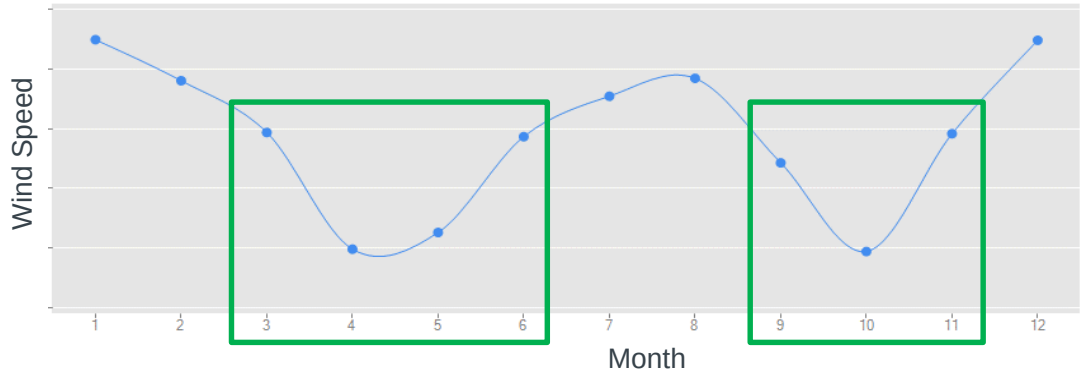
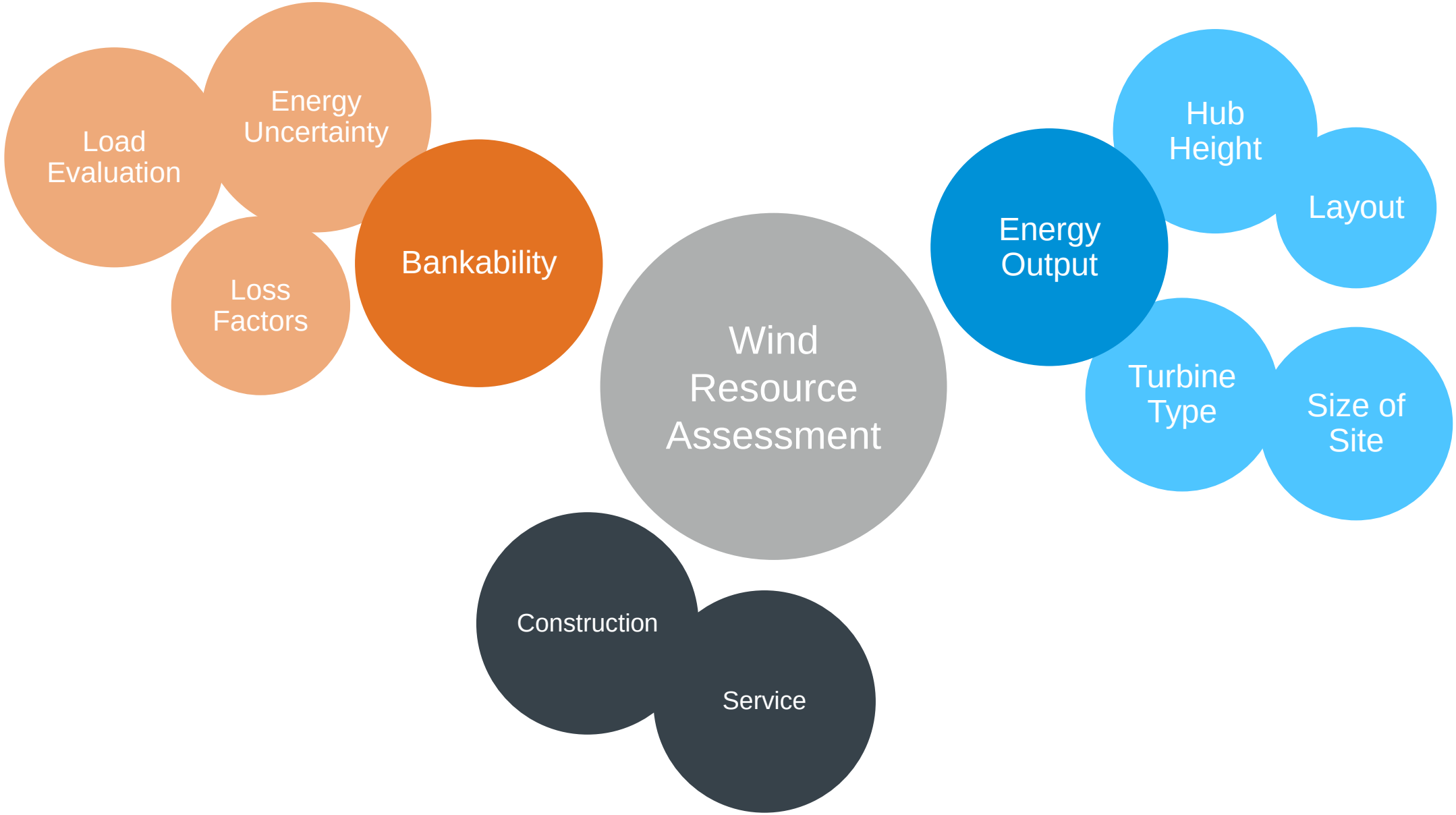
Construction and Service

Understanding wind resource can help in the optimisation of construction and service.



Service and construction windows.

- Optimisation of civil costs through layout design.
- Enables long term service contracts with low lost production.



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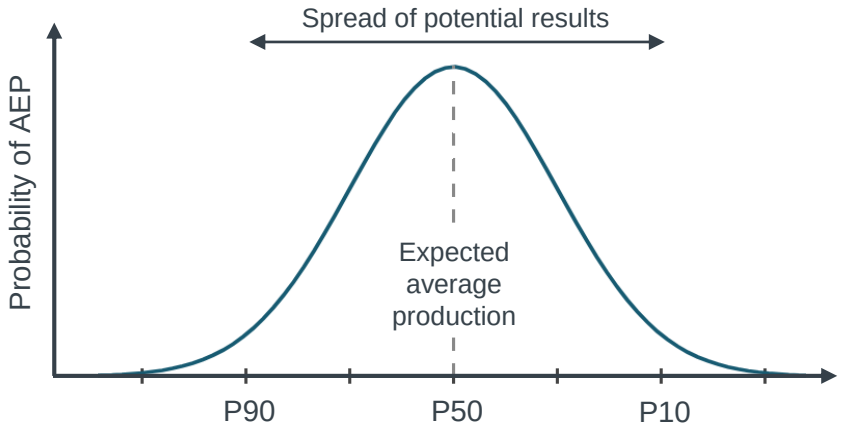
Reducing Modelling Uncertainty

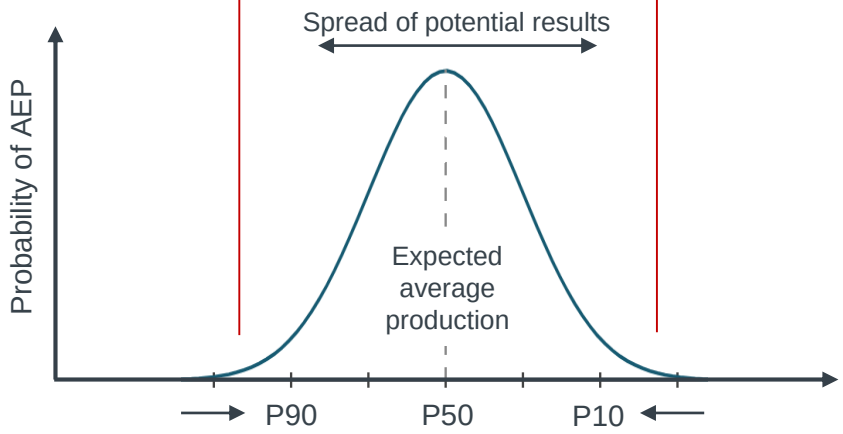
BASE CASE

- Energy yield based on known wind resource in that area.
- Loss assumptions made based on past experience.



OPTIMISED CASE

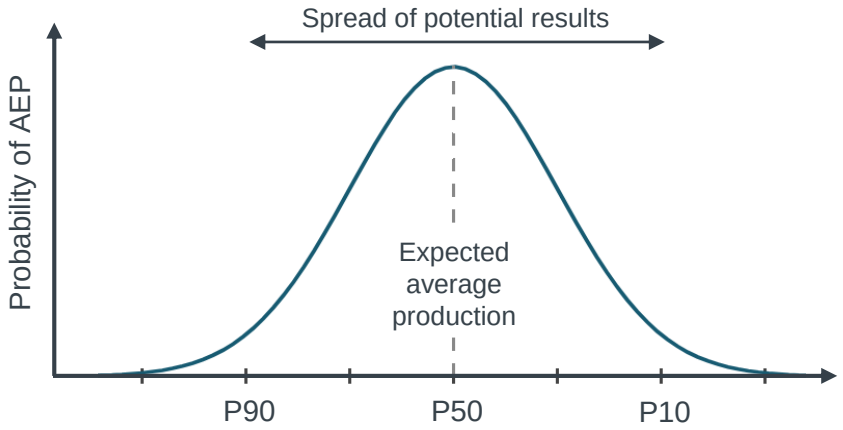
- Improvements in measurement campaign and modelling processes reduce the uncertainty.
- This increases the P75 and P90.



Validating Loss Factors

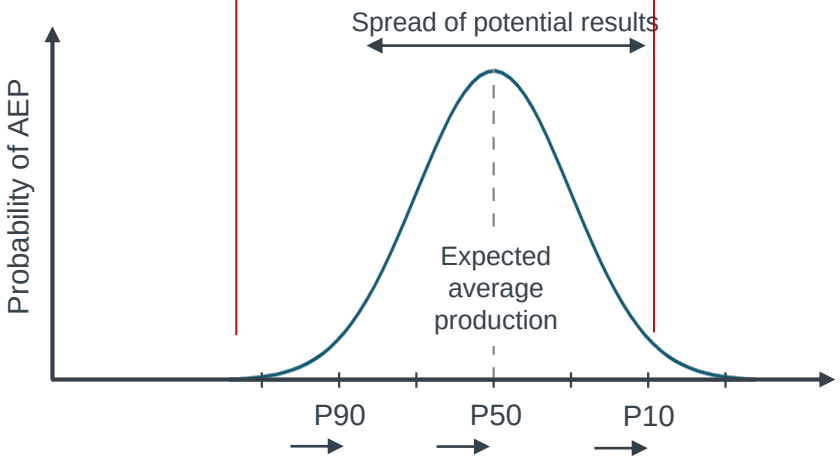
BASE CASE

- Energy yield based on known wind resource in that area.
- Loss assumptions made based on past experience.

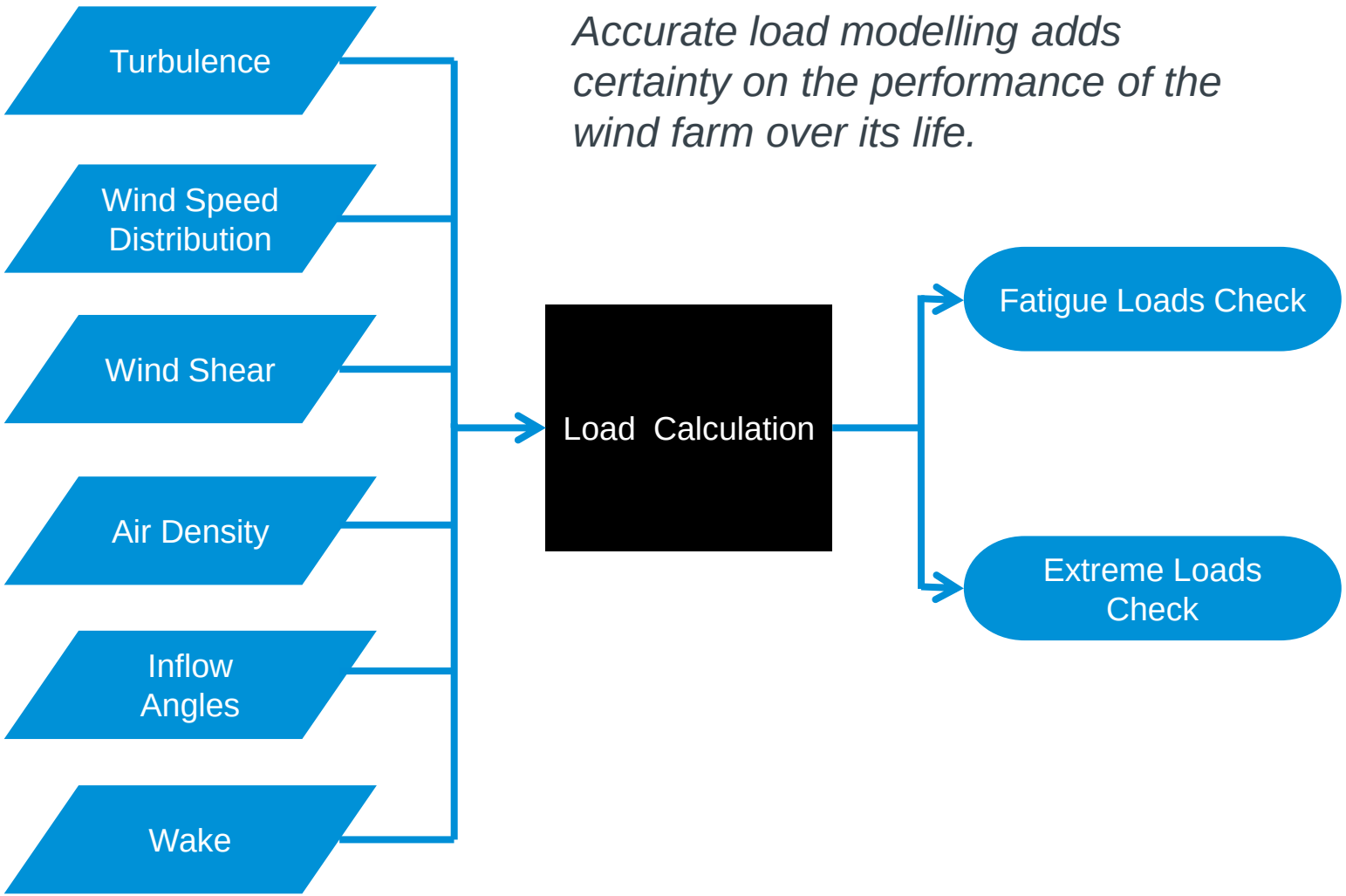


OPTIMISED CASE

- Quantification of losses can improve the estimated energy output of the wind farm.
- This impacts the P50, P75 and P90.



Load Evaluations



Accurate load modelling adds certainty on the performance of the wind farm over its life.

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Focussing on Wind Resource Assessment can help to unlock the potential of your wind power plant.