



Array Modelling and Deployment Support Services

Our combined technical and R&D modelling approach enables us to offer array modelling and deployment simulation support from layout optimisation to inter-array cabling and grid connection.

Tidal array layouts are currently driven by large scale coarse-resolution models using simplistic turbine representations that do not accurately represent the near wake region. Fine-scale, high-resolution Computational Fluid Dynamics (CFD) models can be used to model turbine wake and turbulence but are computationally expensive, particularly when modelling entire project sites.

Our approach has been to modify an existing hydrodynamic model, and incorporate a turbine and rotor effects module. This has resulted in a model with a large range of resolutions (from device to regional scales) that can be run at low computational cost.

ARRAY MODELLING:

- Positioning and layout optimisation
- Output and performance prediction
- Wake and turbulence effects
- Impact prediction and modelling

ARRAY DESIGN AND INSTALLATION:

- Construction & operating support
- Access, construction & maintenance planning
- Inter-array cabling
- Grid connection and integration

ARRAY MODELLING METHOD: HOW DOES IT WORK?

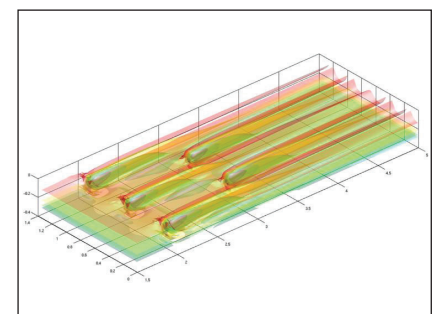
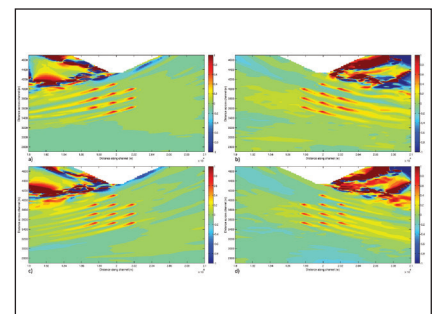
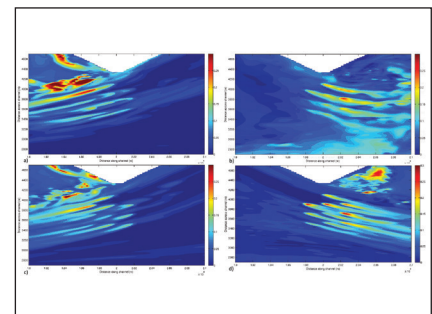
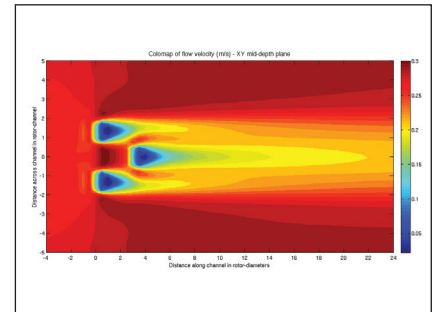
The Turbine Module incorporated into a hydrodynamic model is an innovative approach that treats each individual device as a mid-water column object, accounting for the momentum captured as well as the sub-grid scale turbulence effects caused by devices on flow hydrodynamics. This method is derived from techniques found in high resolution Computational Fluid Dynamics (CFD) and coarse resolution ocean circulation models developed for wind energy and aerodynamics research.

HOW THIS METHOD APPLIES TO YOU:

This approach can be used for pre-deployment resource assessment and planning, as well as hydrodynamic impact and power output assessments for multiple device arrays. The study area can stretch over several kilometres whilst having a local grid resolution up to a third of the device rotor diameter.

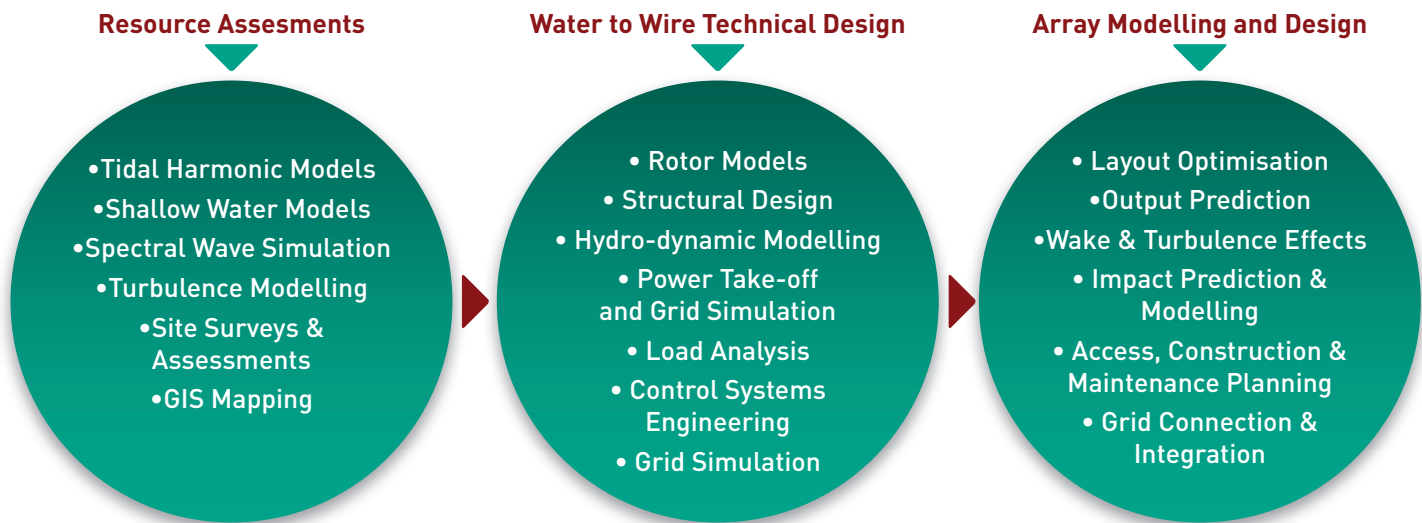
ARRAY DESIGN

Our array design simulation solutions can help to outline your grid connection requirements and specifications, as well as array access and inter-array cabling layout. This complements our Control Systems Engineering capabilities to once again demonstrate how IT Power and Fraunhofer IWES can tailor our expertise to any part of your technical development.



MARINE ENERGY SIMULATION SOLUTIONS

Our **Array Modelling and Deployment Support Services** form part of our **Simulation Design & Modelling Solutions** that we offer marine energy technology and project developers.



WHO WE ARE

IT Power has provided independent consulting and engineering support to the marine energy sector since 1992. The Fraunhofer Institute for Wind Energy and Energy System Technology IWES is a world-renowned research and technology development facility. Together, we can provide you with the practical consulting experience and cutting edge research and design resources to deliver success for your technology and projects.

We have already helped several companies develop full scale demonstration prototypes. Find out how we can help your marine energy development.

OUR PARTNERSHIP

The IT Power and Fraunhofer IWES partnership is built on a long standing collaboration between the two organisations that has spanned over 15 years. We have worked cooperatively on over a dozen major reach projects. Our partnership therefore offers you the very best engineering support and technical expertise for your marine energy project development. Our simulation solutions deliver expertise throughout the entire cycle of both technology and project development, from resource assessment, to device evolution and project commissioning.

ENGINEERING EXPERTS FOR YOUR MARINE TECHNOLOGY SUCCESS

We can provide all of your modelling simulation support and project design services to solidify your place as a marine energy front-runner.

OUR DEDICATED TEAM OF EXPERTS INCLUDE:

- Mechanical and Electrical Engineers
- Naval Architects
- Hydro-dynamists
- Oceanographers
- Environmental Scientists
- Numerical Modellers

CONTACT US

To find out how we can provide simulation solutions for your marine energy project, get in touch.



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