

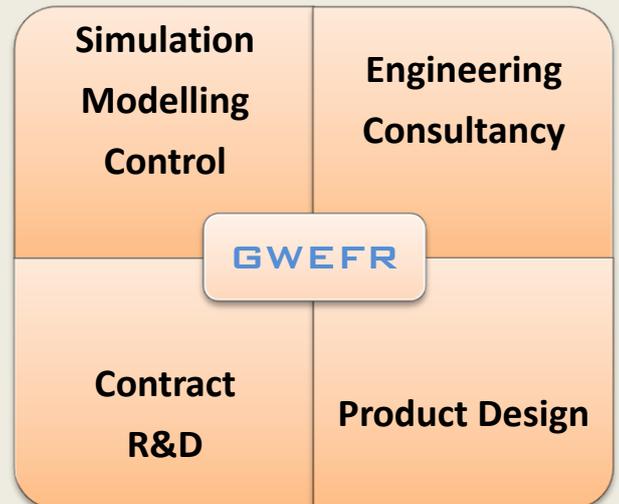
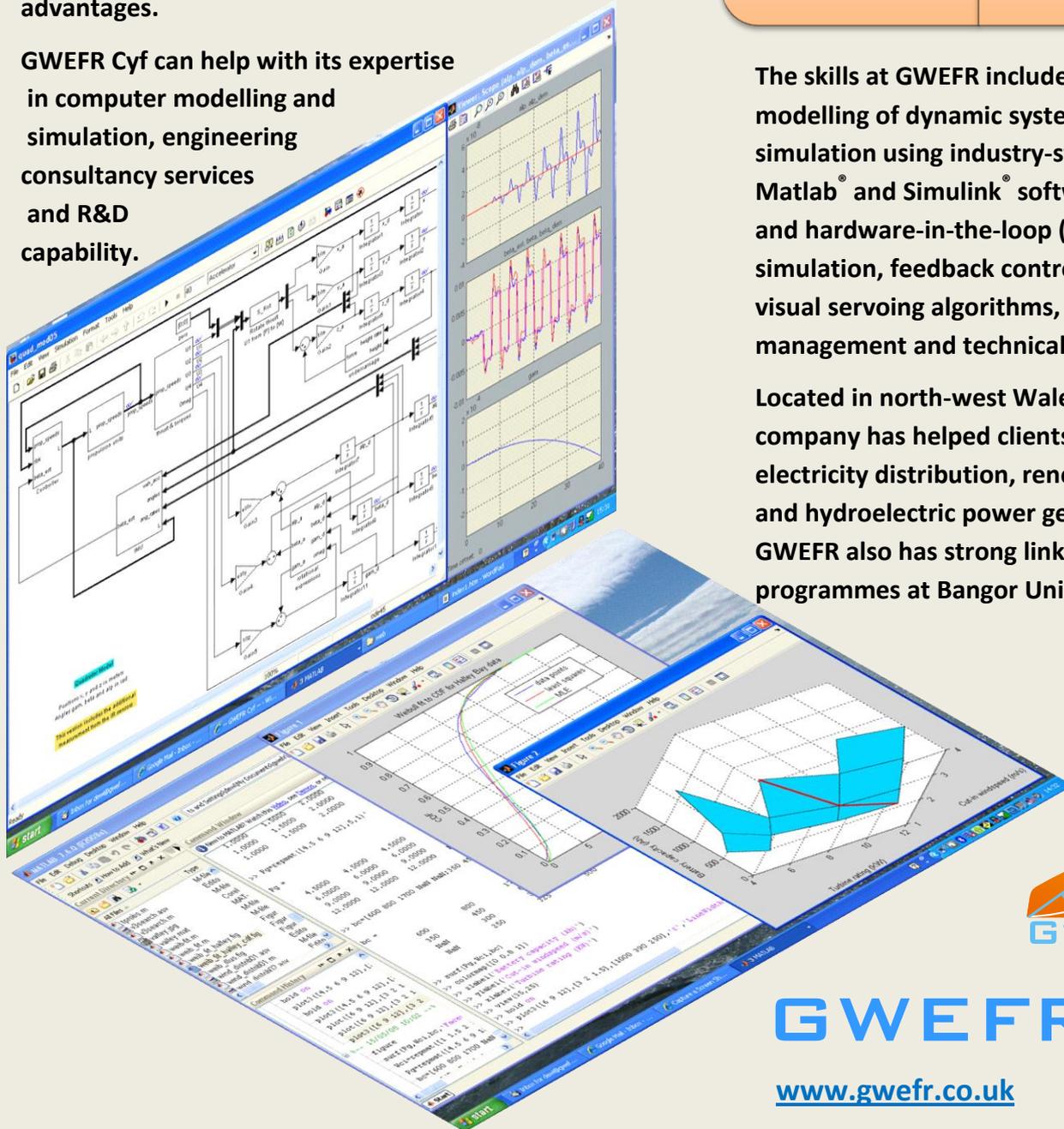
# Simulation, modelling and control of physical systems

Computer models of physical systems:

- give insight and improved understanding
- help visualise complex phenomena
- make accurate predictions of performance
- allow rapid optimisation of parameters

Computer simulation is widely used in industry to minimise risk due to unforeseen technical problems and to reduce the time and cost of the design iteration cycle. However, not all companies have the knowledge and resources needed to benefit from its advantages.

GWEFR Cyf can help with its expertise in computer modelling and simulation, engineering consultancy services and R&D capability.



The skills at GWEFR include mathematical modelling of dynamic systems, off-line simulation using industry-standard Matlab® and Simulink® software, real-time and hardware-in-the-loop (HIL) simulation, feedback control systems, visual servoing algorithms, project management and technical reporting.

Located in north-west Wales, the company has helped clients in the fields of electricity distribution, renewable energy and hydroelectric power generation. GWEFR also has strong links to research programmes at Bangor University.



**GWEFR CYF**

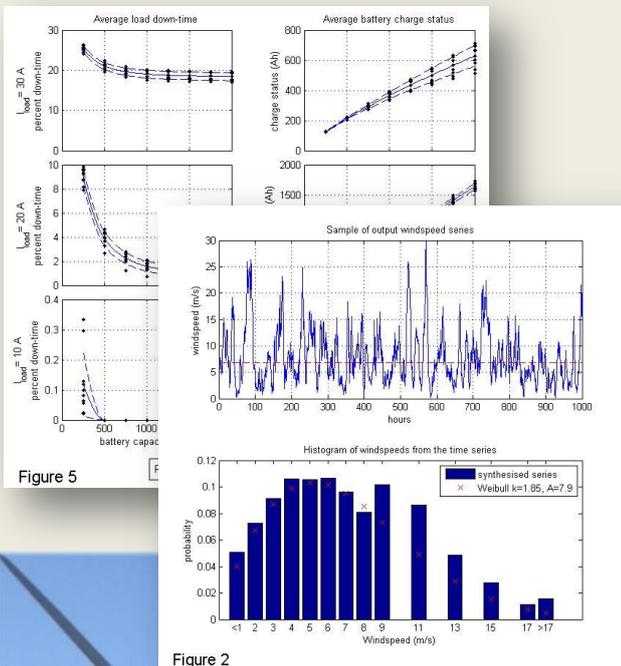
[www.gwefr.co.uk](http://www.gwefr.co.uk)

**GWEFR can develop bespoke off-line and real-time simulations of physical systems working from the client's description of their plant and its control system. We also offer two generic packages, which are ideal as affordable introductions to computer simulation for those new to the idea.**

**Long-term simulation of off-grid wind generator systems**

This simulation package helps assess the viability of a proposed site for a wind-generator system (WGS) that is not connected to the electricity grid. Minimising load outage becomes critically dependent on local energy storage as well as the power characteristic of the wind turbine and the wind environment itself.

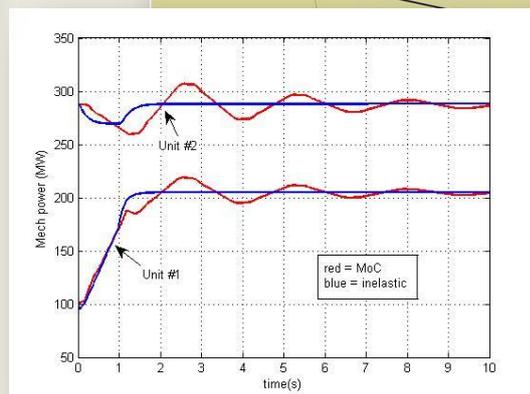
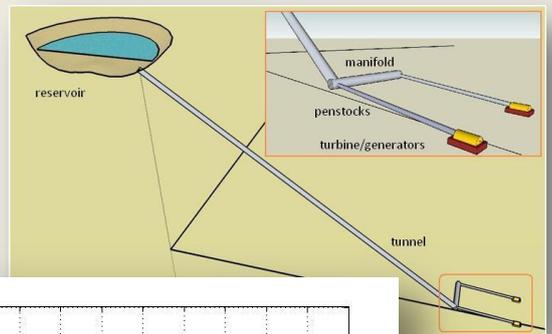
If you can provide us with a modest amount of information on your proposed installation then we will run batch simulations to explore the effect of varying parameter values on system performance.



**Simulation of hydroelectric system control**

This simulation package helps in the design and specification of control systems (governors) for hydroelectric power stations. It is particularly useful at the feasibility study or preliminary design stages of the project life-cycle and only requires a minimum amount of information (reservoir head, pipe lengths and diameters, turbine/generator ratings etc) for your proposed site.

The generic package is excellent for hydro developers who recognise the value of early knowledge about system behaviour but do not have the staff or software to do the modelling in-house.



Simulating wind generator systems requires wind speed data, which can often be expensive and difficult to obtain. GWEFR sells synthetic 10-year hourly-mean wind speed datasets, produced to comply with the long-term measured statistics for almost 200 sites in the European Wind Atlas.

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