

MAXIMISING YOUR  
**Offshore wind assets**

**ASSET OPERATION & MAINTENANCE SERVICES**



**res**  
power for good

**RES** is one of the world's **leading renewable energy companies** active in the wind, wave, tidal, solar and biomass sectors



THE QUEEN'S AWARDS  
FOR ENTERPRISE  
INTERNATIONAL TRADE  
2013

Asset Management

Maintenance Campaigns

Advisory Services

Met Mast O&M





In-house Engineering Expertise



We can integrate as part of the client's team

## RES OFFSHORE

RES can optimise your wind farm assets, with our dedicated team of over 200 experts located across the UK, Europe and USA. We have the full range of in-house capabilities required for: complete wind farm **asset management**, management of **maintenance campaigns**, specialist **advisory services** and **met mast O&M**.

Our offshore operational experience and deep technical and engineering understanding makes us an excellent partner for delivering your O&M services.

Our wealth of in-house technical, engineering, construction and asset operation and maintenance expertise has been gained from over 30 years in the renewables industry and we deliver services to clients across all phases of projects. We have participated in all UK rounds and in projects across Europe and North America with a client list including Centrica, DONG Energy, SMart Wind, Forewind and Iberdrola.

Our **asset operation** and **maintenance services** can **maximise** your offshore wind assets

20 years **experience**  
managing our own  
wind farms gives us  
**unrivalled expertise**

Complete integrated service  
from turbine to shore

Stakeholder management

Data analysis & management

Operational optimisation

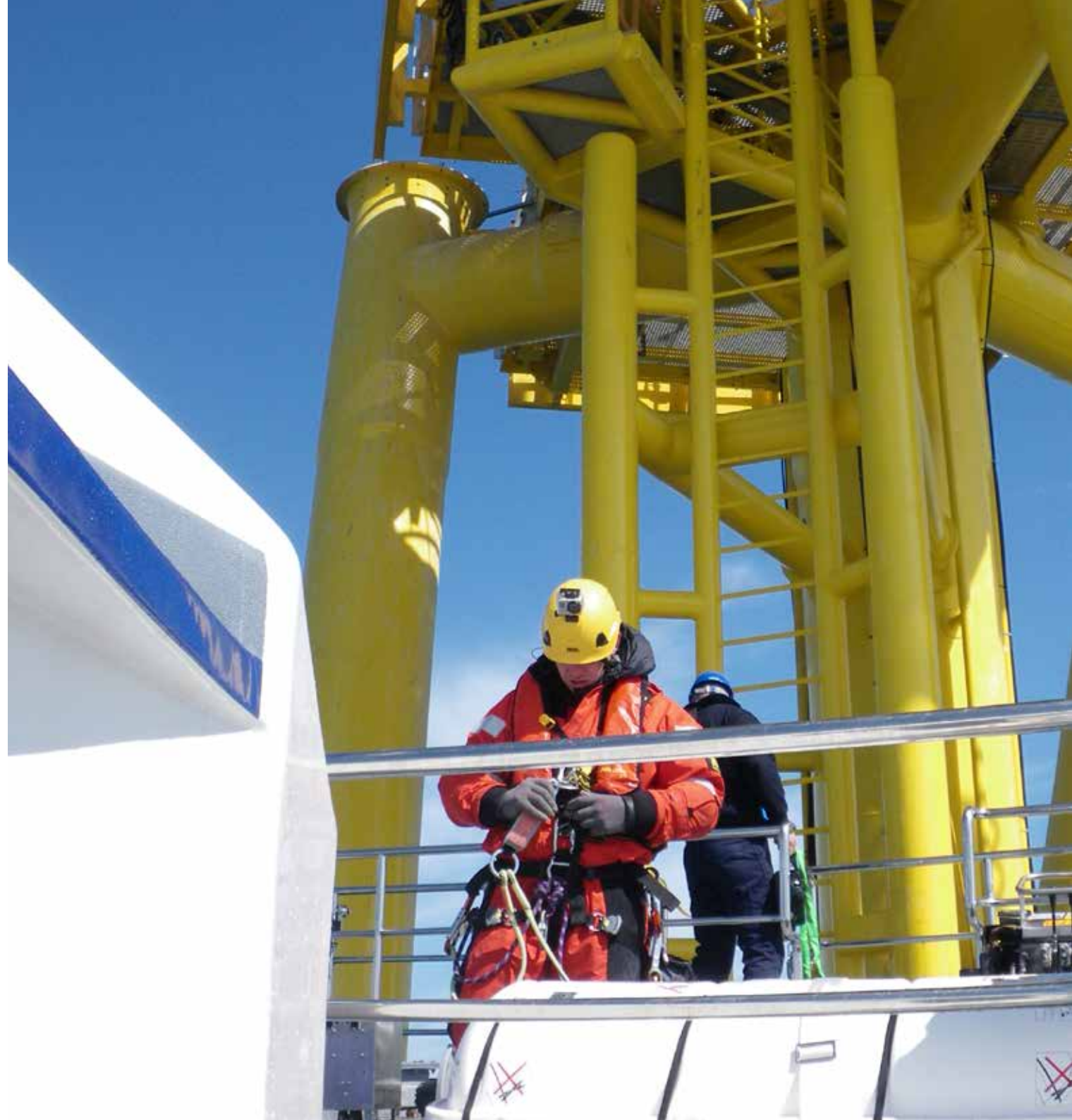




Photo: SMart Wind



Providing Specialist Personnel & Vessels



Replacing and Calibrating Equipment

## ASSET MANAGEMENT

RES has over 20 years' experience of wind farm operation and maintenance, managing a portfolio of over 1200 MW of onshore operating projects worldwide.

This broad experience, together with our specialist offshore environmental and engineering capabilities, provides a sound basis for the management of offshore wind and marine energy projects.

Maximising the energy yield of an offshore project whilst minimising costs presents a whole new range of challenges for project owners. It requires the integration of the full range of commercial, technical, engineering, environmental and project management skills. We can provide an integrated management service which will optimise reliability, availability and energy yield for wind, tidal stream and wave energy projects.

### SERVICES INCLUDE:

Operation and maintenance strategy development and performance optimisation

Operational health, safety and environmental management and monitoring

Operational phase environmental survey management

Performance and production reporting and optimisation

Reliability monitoring and down-time evaluation

Condition monitoring and maintenance planning

Equipment failure investigations

Grid code compliance monitoring

Stakeholder relations and data management

Contractor selection and management

We **optimise** the **safe** and **efficient** operation of wind farms for our clients

From complete scheduled **maintenance campaigns** to specific issues across **balance of plant** or **turbines**, we can meet your requirements

End of warranty inspections

Blade inspection & repair

Gearbox oil sampling & change

Structural material assessment & repair

Subsea inspections

Environmental monitoring

Independent verification

Statutory safety inspections

Client representation





Balance of Plant Inspections



Turbine Maintenance

## MAINTENANCE CAMPAIGNS

RES Offshore can plan and execute your maintenance campaigns. We perform all types of activities, from minor everyday tasks such as ID light change out, to complex bespoke engineering solutions such as a wind farm-wide monopile grouted connection repair. **Whether scheduled upkeep or an immediate requirement, whatever the task, we have the expertise.**

Our services include, but are not limited to:

BALANCE OF PLANT
Transition piece condition assessment and remedial works
Independent verification inspections
Subsea inspections, including cabling
Materials, welding and corrosion, cathodic protection
Environmental surveys and monitoring
Statutory safety inspections

TURBINE MAINTENANCE
Independent verification inspections
Handover and end of warranty inspections
Gearbox oil change
Blade inspection and repair
Blade bearing change
Statutory safety inspections
Gearbox and transformer oil sampling

We provide both **strategy** and **implementation** for your maintenance campaigns

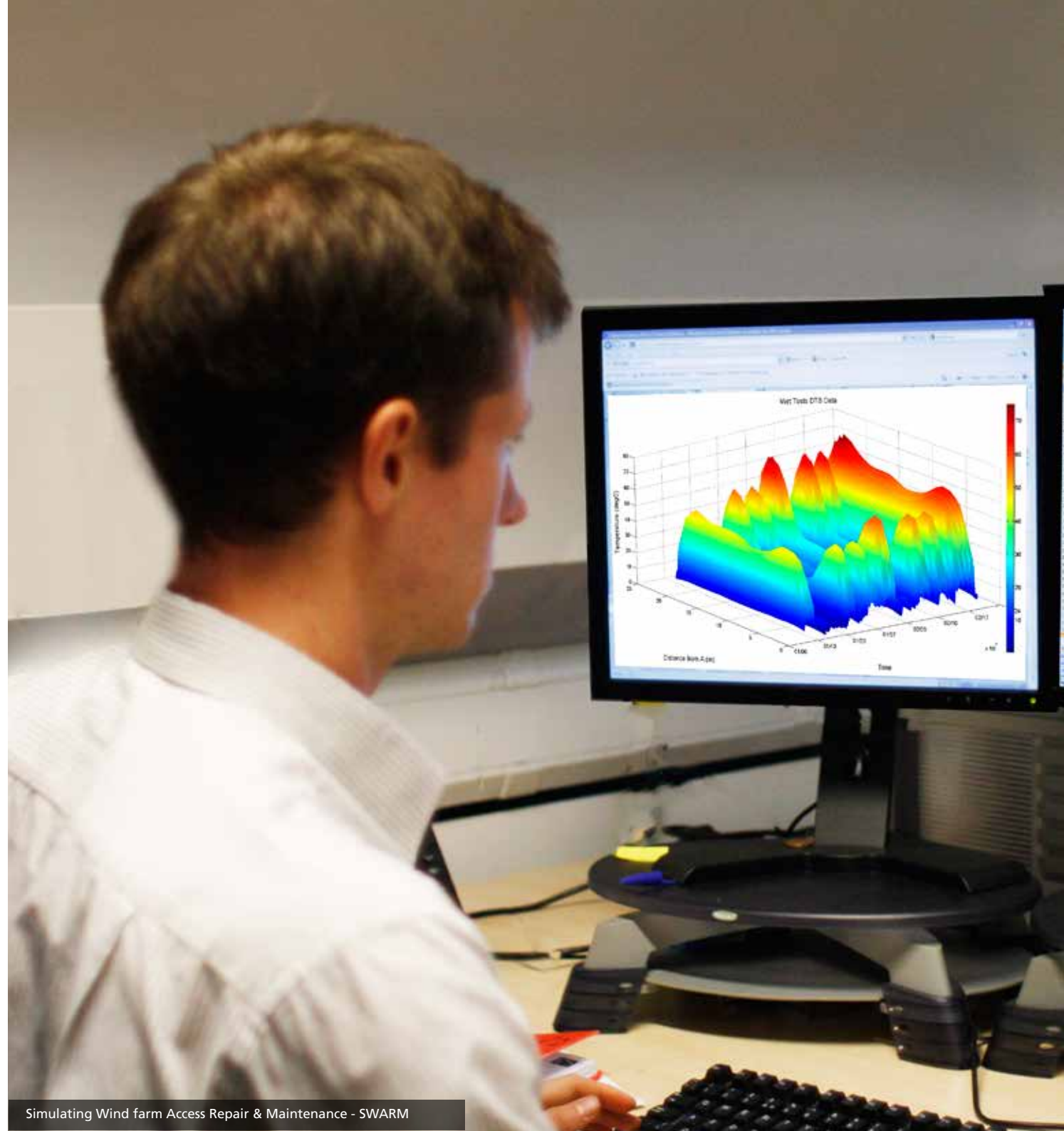
We provide **specialist advice** for all areas of offshore wind farm **maintenance**

Engineering expertise

Management systems skills

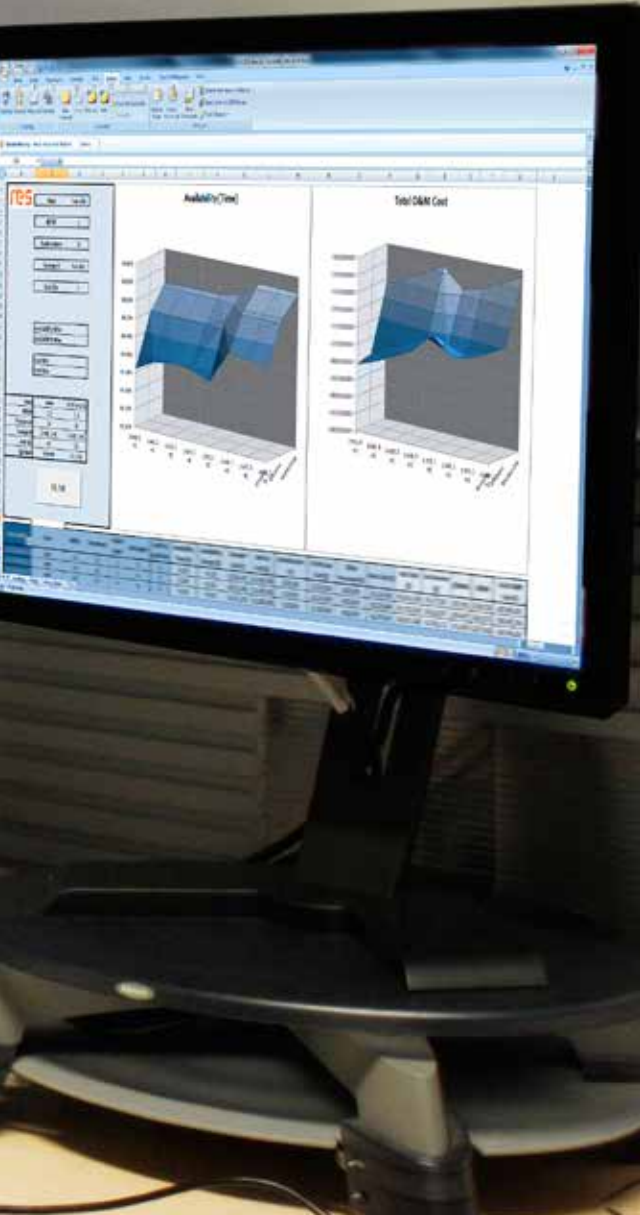
In-house O&M  
operations modelling

Commercial support



Simulating Wind farm Access Repair & Maintenance - SWARM





Health & Safety Exercise



Engineering Solutions

## ADVISORY SERVICES

### ENGINEERING SOLUTIONS

- Structural analysis, bespoke technical solutions
- Cables, electrical systems
- Reliability engineering
- Condition monitoring
- Root cause analysis
- Data management and analysis

### ESTABLISH FRAMEWORK

- Set-up of O&M operations
- Developing systems: e.g. response flowcharts in case of faults
- Health & Safety: e.g. creation and review of emergency response preparedness plans (including developing and running training exercises)

### COMMERCIAL SUPPORT

- Supplier review & procurement
- Due Diligence
- Insurance inspections and maintenance: e.g. turbine warranty claims

### IN-HOUSE MAINTENANCE OPERATIONS MODELLING

Using a variety of tools, including SWARM (Simulating Wind farm Access Repair & Maintenance) our in-house time-step model software, we can help identify the optimum O&M strategy for a wind farm. The tool uses real weather data, vessel operating characteristics, failure modes and probabilities to assess the overall O&M cost, including lost generation.

Established in offshore wind since the beginning;  
we offer our **specialist expertise**

Whether you require **full asset management** or **specific project support**, your met mast is in expert hands

Site acceptance and testing

Provision of specialist personnel and vessels

Data monitoring and analysis

Equipment replacement and calibration

Structural integrity checks





Experience of Round 3 Met Mast Maintenance



Provision of Specialist Personnel

## MET MAST OPERATION & MAINTENANCE

We offer a specialist O&M service to met mast owners, taking on the overall management responsibility to ensure consistent high quality data.

Depending on our clients' needs, we use our in-house expertise to undertake planning, technical, engineering, management and supervision. We use carefully selected partners to provide vessels and trained technicians.

We have experience of maintaining Round 2 met masts **and are the first company with experience of Round 3 met mast operation and maintenance far offshore.**

We have the capability to provide a full Engineering, Procurement, Commissioning and Installation (EPCI) offshore met mast package.

We manage the logistical and safety challenges of weather and sea conditions, isolation and working at height to provide:

Client representation during onshore site acceptance testing and offshore installation
Provision of vessels and personnel suitable for the site and tasks
Change out and re-calibration of instrumentation
Periodic structural integrity and bolt torque checks
Unplanned maintenance activities, such as fault finding, re-design and upgrades as required
Monitoring and analysis of data from the met mast
Balance of plant maintenance – removal of corrosive material, cleansing solar panels, subsea operations

Managing the **technical** and **logistical challenges** where **safety** is paramount



RES Offshore provide technical and operational expertise for developers and owners of offshore wind farm assets

**Contact us now to discuss how we can help you:**

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With thanks to A Bearne (RES), SMart Wind and Centrica for photographs

RES Group | V1 | 0513

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