



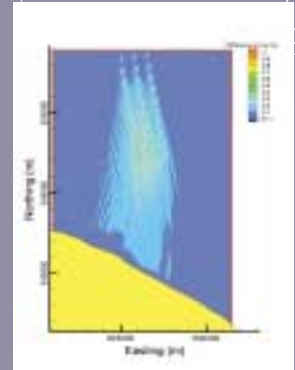
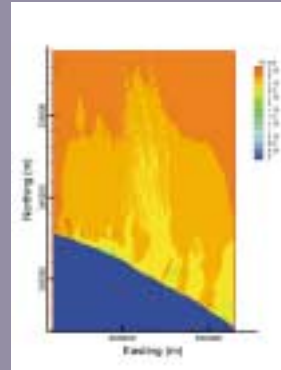
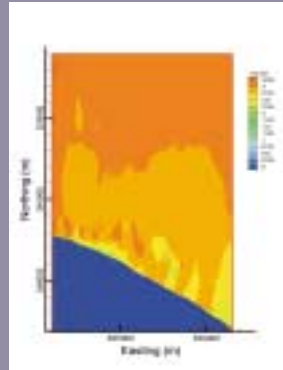
offshore wind

renewable energy



ROYAL HASKONING
thinking in
all dimensions

renewable energy



renewable energy – harnessing the wind

For wind energy projects, Royal Haskoning, through Posford Haskoning Ltd and Haskoning Nederland bv, can provide a wide range of environmental and engineering services to aid the progression and implementation of each project. Royal Haskoning can help in all areas from feasibility to decommissioning including all consenting requirements and the associated studies, transportation,

construction, operation and maintenance.

Royal Haskoning offers a unique complementary skill set supported by a long and proven track record. State-of-the-art technical expertise is delivered through a project management team, creating synergy with the developer's team and efficient total project delivery.



diverse services

Environmental Studies

- Scoping, consultation and ongoing liaison with the DTI and statutory consultees
- Environmental Impact Assessment
- Appropriate Assessment (if required under the Conservation Regulations)
- Impact on marine mammals and fish, fisheries and benthic habitats and species
- Impacts on birds and migratory routes
- Landscape and visual impacts
- Monitoring, management and mitigation plans
- Radio and microwave interference
- Cumulative effects

Possible Consent

- Transport and works act 1992, Section 34 Coast Protection Act 1949 (for works in navigable waters); Section 36 Consent under Electricity Act 1989; FEPA Licence under Section 5 Food & Environment Protection Act 1985 (for deposits in the sea); Town & Country Planning Consent (for onshore facilities); Section 37 Consent under Electricity Act 1989 (for overhead lines); Section 109 Water Resources Act 1991 (for building in a main river); Environment Agency Consents (for crossing or breaching a sea defence); Land leases & Wayleave & Crown Estate Lease.
- DTI's Proposed Consents Process for Offshore Wind or Water Generating Stations



Coastal Processes

- First principle derivation of wave height data
- Frequency analysis of waves and wind data (weather windows/downtime)
- Shallow water bed effects
- Wind-Wave interaction
- Scour protection and rock armouring
- Sand bank migration, sand waves and sediment transport
- Beach processes, littoral movements, currents

Navigational Impact Assessment

- Navigational hazard assessment
- Mitigation of development impact
- Siting optimisation
- Marine traffic risk simulation modelling
- Aids for Navigation
- Alternative scenario testing



Maritime design and construction

- Foundation selection and design
- Buildability and construction risk
- Integral mast and foundation response
- Geotechnical investigation and design
- Mast installation
- Dredging and fill placement
- Operational access/fendering
- Durability issues
- Decommissioning

Other Related Maritime Renewable Energy Sources

Many of the above fields of technical expertise are applicable to other related Maritime Power Generation opportunities including:

- Wave Power Generation – Coastline and Offshore
- Tidal Current Power Generation

Royal Haskoning is an independent, worldwide operating consultancy that has its origins in a firm established in 1881 in the Netherlands. The consultancy now has a staff of 2,900 who together combine a wide range of knowledge and experience. Rooted in a technical background, our consultancy services focus on the broad field of the interaction between people and their environment.

We are committed to working enthusiastically with our clients to achieve sustainable solutions in an increasingly complex society. The expertise and experience of our professionals in a variety of disciplines allow us to consider all technical, logistical, architectural, legal,

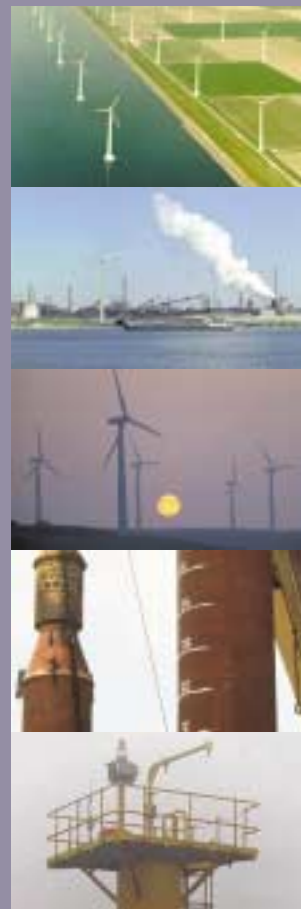
organisational, social, environmental and economic aspects of your project, in order to develop sustainable and practical solutions. Royal Haskoning has subsidiaries and partners throughout the world.

Posford Haskoning is the UK branch of Royal Haskoning. Through our branch and project offices in Europe and overseas, we have access to all major international markets. This way, Royal Haskoning offers multidisciplinary and integrated services locally, based on experience built globally. With our personal service in consultancy, we contribute effectively to the successful planning, design, implementation, commissioning and operation of your projects and programmes.

Royal Haskoning, through Posford Haskoning Ltd and Haskoning Nederland bv, is a member of:

- ACE The Association of Consulting Engineers
- BCB British Consultants Bureau
- PIANC International Navigation Association
- ICHCA International Cargo Handling Co-ordination Association
- CIRIA Construction Industry Research Information Association British Section
- ICID International Commission on Irrigation and Drainage
- IEMA Institute of Environmental and Management Assessment
- FIDIC International Federation of Consulting Engineers

As part of Royal Haskoning, Posford Haskoning Ltd or Haskoning Nederland bv is registered with: African Development Bank, Asian Development Bank, Caribbean Development Bank, European Bank for Reconstruction and Development, European Development Fund, International Development Bank, Islamic Development Bank, Kuwait Fund for Arab Economic Development, Overseas Development Administration, United Nations Development Programme World Bank, and many other Funds and National Authorities.



thinking in all dimensions

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