



# ECN

Your energy. Our passion.

## Advanced wind farm development solutions

### Maximising offshore wind project profitability

For offshore projects, complex (and ever-changing) site requirements, along with tough consenting procedures, present enormous challenges for design and financial planning. ECN brings a wealth of experience and unique, innovative design solutions to your project to ensure the maximum potential of the site is realised. The independence and accuracy of our work will also facilitate a smoother and more efficient consenting process.

For example, various studies have shown that the ECN tools for designing and analysing wind farm layout and performance are among, if not the most accurate in the world, and our OPEX cost modelling/optimisation methods are unparalleled in the industry. Wind farm developers and operators benefit from fast, efficient project implementation, while investors appreciate detailed insights into risks, quantification, and mitigation strategies.

ECN works closely with companies throughout the wind energy supply chain, assisting wind farm developers, turbine manufacturers, investors, vessel companies, and service suppliers. ECN can be your technical partner in order to maximise the output of the site with the lowest possible operational costs, and improving your returns. Which ultimately, of course, lowers the cost of energy.

### What can ECN offer you?

- Leading expertise, experience and cutting-edge methods
- One of the longest track records and respected names in offshore wind energy
- Wind farm designs and operational plans, optimised to meet the site requirements and long-term operational goals

### Looking for game-changing technology?

Numerous operators are already seeing the potential benefits of wind farm management based on ECN's patented Active Wake Control. ECN aims to see this effective approach implemented on a large scale, controlling wind farms as a whole to maximise output and minimise both load and turbine wear.

Relying on its 40 years of experience in R&D, testing and consulting in the wind energy sector, ECN is committed to accelerating and incorporating innovations as they become available. Implementing cutting-edge technology as soon as it is validated makes it possible to optimise wind farm design from the outset, keeping ECN customers ahead of the curve.

ECN can provide services throughout the lifecycle that optimise wind farms from day one straight through to dismantling. ECN is the perfect and complimentary partner to advise you

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### Your full lifecycle wind farm development partner

Conceptual phase



Manufacturing and installation



Commissioning phase



Operational phase



Re-powering and dismantling

When ECN's validated technologies, methods and innovations are incorporated from the outset, wind farm output can be maximised at the lowest possible operational cost. ECN also provides support during the tender process by helping customers verify bid documents, select the technology that best suits the specific demands of their site, and devise the appropriate designs and contracts. Prevent problems in the future by making the right decisions and agreements from day 1.

ECN can support wind farm developers and operators throughout the manufacturing and installation phase, overseeing the process and monitoring results during implementation. The independent, objective expertise that ECN can provide is invaluable in troubleshooting and identifying root causes of issues that arise. Our proven track record in wind energy technologies and data analysis ensures that we will be able to advise you on practical solutions for pre-commissioning problems.

During the pre-operation phase, it is absolutely vital to ensure that everything is working properly. Independent verification is required to attain certification. ECN is a fully accredited measurement institute, and uses its tried-and-tested techniques and methods, in collaboration with key partners, to provide all the information you need. ECN helps to get the turbines commissioned as quickly as possible and get the plant up to full operational capacity. ECN acts as a middle man between the developer and turbine company in resolving inevitable start-up bugs.

ECN supports wind farm owners in continuous improvements towards operational excellence. O&M optimisation, business planning and contract re-negotiations are perfect examples of this. ECN's leading cost modelling tools and data collection and analysis approaches offer unparalleled insights and decision-making ability for your asset. ECN helps wind farm operators and associated companies to select and implement new technologies as they become available and quantifies the business case. ECN also has the latest technology to help you avoid excessive and costly unexpected corrective maintenance.

As turbines reach the end of their life or become obsolete, they may be replaced by new technology. ECN can help you devise a design strategy for installing new turbines or blades at an existing wind farm, incorporating them into the existing site while minimising downtime. Similarly, ECN can support customers in crafting a cost-effective plan for environmentally responsible removal and/or recycling once a turbine has reached the end of its viable lifetime.