

# Offshore Wind Meets Nuclear

*Most of the challenges in the development and procurement of offshore wind energy have been faced before- why not take a chance and have a look at lessons learned from the nuclear field?*

## Offshore Challenges

Many countries have pinned their hopes on offshore wind as they are mastering the transition from fossil and nuclear to clean and renewable energy. Currently more than 850 offshore projects exist around the globe. However, so far the construction of offshore wind farms has not yet lived up to its promises.

Rapid technology advancement of still immature offshore wind technologies, a lack of standardization, inadequate planning as well as a still emerging supplier landscape have made it difficult for owners to meet expected performance targets (see figure). Many projects are currently delayed and face cost overruns or grid connection problems. Some projects are postponed for an indefinite time.

As water depth and distance to shore increase cost and complexity, they have to be considered for project comparison: Alpha Ventus and Baltic 1 (GER) are over 40 km from shore ranging from 20 to 45 meters in depth. Both were delayed due to grid connection issues. UK projects are typically closer to shore and in shallow waters. Still, Thanet faced a two year delay due to turbine design immaturity.

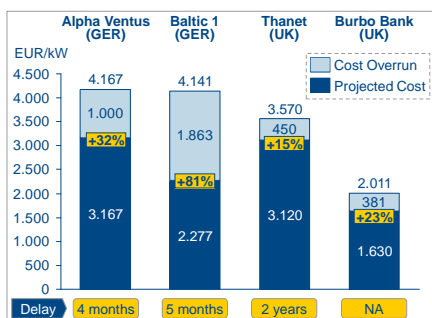


Figure: Offshore Wind New Build Performance

Also owner structures and delivery models impose challenges. Until today, owners and developers have tried multiple concepts without one emerging as favored solution. Project management and execution models vary and are often disintegrated across owner, developer and suppliers.

These challenges may be offshore specific. But, similar issues were also faced by the nuclear industry in its early days when nuclear was still an emerging technology, as well as in the beginning of the nuclear renaissance when owners needed to regain lost new build capabilities.

## Nuclear Failures

Nuclear new build projects have a long history around the globe. This history has however not kept latter-day projects from suffering problems all the way to project cancellations.

The challenges nuclear new build projects were faced with may sound familiar to offshore owners and developers:

- Weak planning, lacking one fully integrated, logic-tied and resource-loaded master schedule
- Advancing technology maturity during requirements specification, design engineering and procurement
- Misjudgment of owner's and suppliers' capabilities with regard to their relative role in the project
- Dependency of the new build from external issues such as grid connection, state policy, permitting and
- Inability of the project to develop a routine and standards based organization

The nuclear industry has reacted to the challenges by developing stringent programs aiming to avoid the most common of reasons for project failure, despite still existing challenges in some projects.

## Nuclear Solutions

The capability of the owner becoming an Intelligent Customer fully understanding the entire supply chain is a prerequisite for success. Successful owners have a learning organization fully capable to orchestrate suppliers and stakeholders.

Successful owners start a project by having the "end in mind", i.e. commercial op-

eration. Planning, procurement and project execution are clearly geared towards a save and high performing plant.

The interdependency of permitting, design engineering and procurement is handled by having a rigorous configuration management in place. This ensures consideration of relevant requirements in all areas.

The chosen delivery model is fitted to the genuine capabilities of the owner, balancing EPC, component and other contractual approaches. Suppliers are asked to work on Early Works Agreements' (EWA) basis and share risks with the owner.

Project development and execution rely on well-defined processes, procedures and instructions allowing for a standards- & routines-based organization. An Integrated Management System and uncompromising Fleet Management are the backbone for high performance.

Due to the nature of nuclear industry, other areas with great expertise include:

- Risk Management
- Aging Management
- Quality Management
- Knowledge Management

## Offshore Meets Nuclear

Offshore wind projects often embrace expertise from the Oil & Gas industry. Facing increasing delays and other challenges it might be the right time to also have a look at an industry which is often considered an antagonist of wind power: nuclear energy.

Please contact us for further information on our expertise in large capital investment projects.

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