



JGC WIND POWER

Orchestrating Wind Power Players

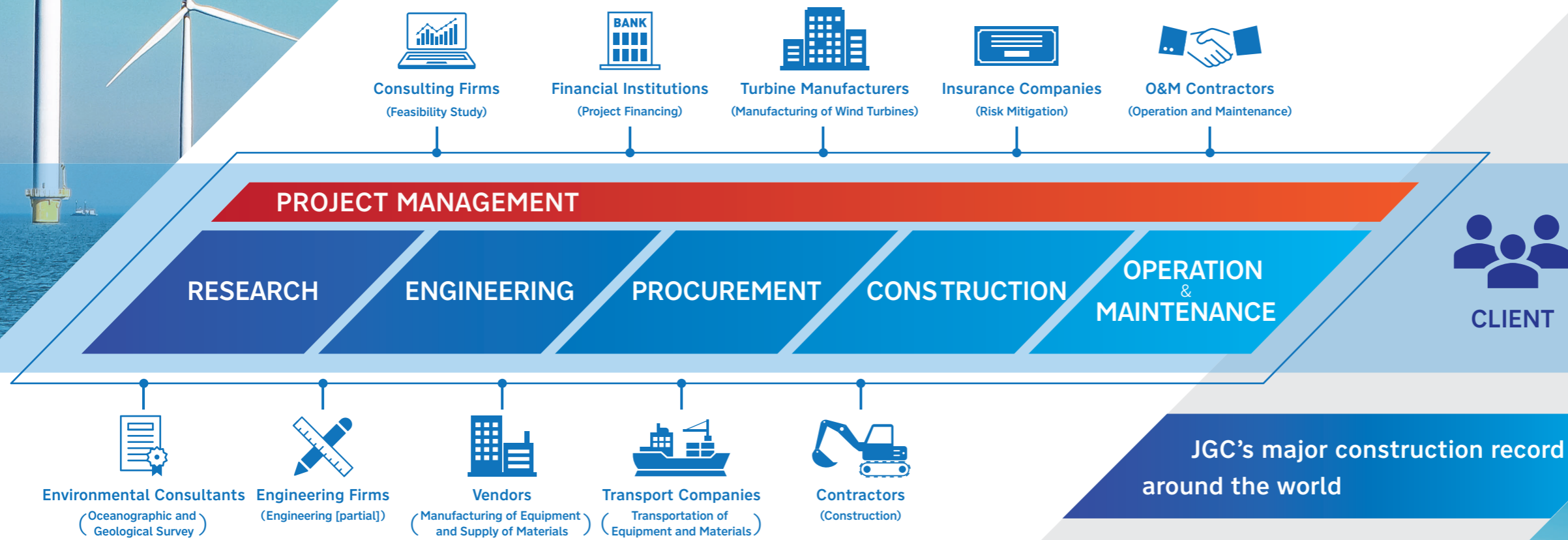
**World-Class Project Management for
Offshore Wind Power Projects**



JGC's Project Management Leads Projects to Success

JGC = PRIME CONTRACTOR

JGC is a prime contractor coordinating all stages for optimal execution overall.
We work with diverse international partners to make projects a success.



Over our 90-year history, JGC has carried out 20,000 plant construction projects in 80 countries worldwide. We work with partners around the world to ensure optimal overall control of project quality, cost, scheduling, and safety.

As global measures in response to climate change have grown more urgent, JGC has promoted widespread use of renewable energy through solar and biomass plant construction.

Behind these offshore wind power generation projects are countless tasks over nearly a decade.

Without a doubt, this shows that effective project management holds the key to success.

Here, we introduce our longstanding mission in this work and the value JGC project management can provide.

JGC's major construction record around the world

Projects completion record

more than **20,000** projects
in over **80** countries

Workforce involved per project

up to **30,000** people

World's best record of zero accidents
requiring time away from work

approx. **130.9** million hours

*For the time duration of the Qatar gas processing plant from July 12, 2012 to March 25, 2014



Success Calls for More Than Technical Proficiency - World-Class Project Management Channels Boundless Engineering Skills into Success -

Wind Power \times Project Management

JGC's VALUE

A partner with solid knowledge of global business

Even if the project location of an offshore wind power plant is in Japan, participant extends to various overseas consultants, turbine manufacturers, and others. We can proceed and manage the project involving international collaboration through a solid knowledge of global business practices. As a Japanese company seasoned in working across borders, JGC is a strong partner throughout these projects.

JGC's VALUE

Engineering management for offshore structures in 3/4 of the world's FLNG operations

JGC has built three out of four world's floating facilities for liquefied natural gas. Our engineering management addresses the special design in offshore facilities, based on experience in floating oil and gas production, storage, and offloading facilities.

JGC's VALUE

Digital management of all materials and equipment

All equipment is tagged at the design stage and all associated data is centrally integrated and managed throughout EPC activities, which enables smooth information exchange and accurate understanding in the overall context of EPC. Our original data centric management system is also applied in wind power projects.

Control product manufacturing carefully to avoid rework

Instead of deferring to suppliers, JGC's hands-on control of material inspires confidence in manufacturing processes, quality, and safety. Experts in engineering and purchasing carefully select suppliers and conduct technical and commercial evaluation. This hands-on approach is also applied across the supply chain in wind power projects.

Marine coordination securing safety and enabling efficient offshore project execution

Marine coordination system is applied for safety and efficient projects execution, in which various information on project management and the status of workers, vessels, weather, and ocean conditions are centrally managed.

Construction and preservation control securing quality, safety, and schedule

JGC's internally developed system enables reliable preservation and material status control for foundation structures, subsea cables, wind turbines and auxiliary equipment. Incorporating our experience in past projects in Japan and overseas, the system realizes seamless flow from engineering and procurement phases to construction and commissioning phases.

Streamlining construction through AWP

The best-practices technique of advanced work packaging (AWP) is used from initial project planning and throughout project life cycles. Work packaging by JGC minimizes gaps between works assumed in design/procurement phase and actual works in construction phase, elevating performance of projects as a whole. A constant knowledge of "what" is needed "when" enables seamless construction.

Safety control at the world's highest level

As seen in safety training for workers, work permit procedures, and other matters, we have established a safety control system focused on logistics and construction that extends to details of daily routine works. As a result of hands-on safety control, we have achieved world-class production without lost time from accidents: nearly 130,000,000 hours in a Middle East project.



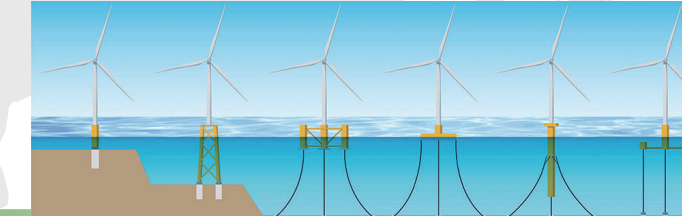
Scrupulous control of procurement through logistics management and construction planning as a key factor of successful construction

Leveraging a network with experts in logistics and starting with delivery route review and authorization acquisition, our comprehensive control encompasses all matters until delivery at construction sites, including expediting and safety control, installation planning, marine warranty surveying, operation and reinforcement of staging port.

Maximum gross cargo material	1,350,000 _{MT} (Vietnam)
Maximum module weight	5,623 _T (Australia)
Maximum machinery weight	2,100 _T (Saudi Arabia)
Maximum inland transport distance	1,600 km (Libya)

JGC's VALUE

Promotion of floating offshore wind power



Semi-Submersible	Semi-submersible floating structure
Barge	Ark-shaped floating structure
Spar	Cylindrical floating structure with low center of gravity
TLP (Tension-Leg Platform)	Semi-submersible floating structure fixed by tension mooring

JGC aims to become a leading company in floating offshore wind power projects.

JGC's VALUE

Management to build vast plants in extreme environments



JGC's strength lies in managing projects to build huge plants in extreme environments such as offshore and on permafrost. JGC excels at handling massive structures utilizing modular construction method in which construction takes place at off-site fabrication yards in advance with various components of plants, and after transport to the final assembly site, installation and integration are performed.

RESEARCH

- Establish business plans and obtain funding
- Build consensus with communities, fishery cooperatives, and other stakeholders
- Conduct environmental assessment

ENGINEERING

- Basic design (turbine selection, determination of quantity, layout)
- Detailed design (execution of plans accounting for procurement and construction in offshore environments)

Solution 1

Environmental assessment support by JANUS backed by 40 years of experience

Framework of JANUS support

- Water environment, flora and fauna, ecosystem, and scenery surveys and forecasts
- Preparation of environmental impact statement
- Support in community briefings
- Facility removal and disposal planning at the project design stage
- Disposal permission applications under the Marine Pollution Prevention Act*

*Act on Prevention of Marine Pollution and Maritime Disaster (Act No.136 of 1970)

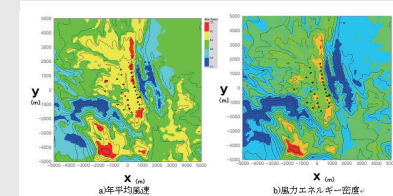


Solution 2

Project finance proposals from fund procurement expert

Solution 1

Specialists in wind analysis support business plans for maximum power generation



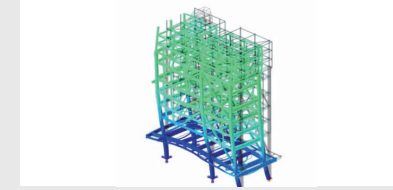
Solution 2

Provides sophisticated design that taps the insight of expert offshore turbine manufacturers and engineering consultants



Solution 3

Performs detailed design reflecting a wealth of experience in procurement, logistics, and construction



PROCUREMENT

- Select optimal suppliers from a holistic view accounting for quality, cost, and delivery schedule
- Conduct manufacturing process management
- Arrange transportation at the optimal timing

Solution 1

Selects optimal vendors on a worldwide scale, from a comprehensive evaluation addressing quality, cost, and delivery

Solution 2

Comprehensive supply chain management from selection of manufacturers to purchase order issue and meticulous control over quality, cost, and delivery schedule



CONSTRUCTION

- Execute construction work accounting for quality, delivery, and safety
- Practice risk management

Solution 1

Construction management applying ample experience in construction of offshore and port facilities

Solution 2

Through collaboration with experienced overseas companies, JGC secures execution know-how as well as resources such as work vessels



OPERATION & MAINTENANCE

- Establish frameworks for plant maintenance securing safe operation

Solution

Establish supply chains of spare parts for plant, and support maintenance indispensable to continuous safe operations



JGC is

A professional corps that excels at project management.

Entrust us with your projects to take advantage of business and engineering expertise on the global stage.

JGC JGC JAPAN CORPORATION

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