

Goto Offshore Wind Farm

8 turbines of Goto Offshore Wind Farm(foreground) and "Haenkaze"

TODA

From the initial development to the full commercialization of floating offshore wind facilities

Toda Corporation has been committed to offshore wind power since 2007, accumulating extensive technical expertise through collaboration with universities, research institutions, and various partners. Since 2010, with the invaluable cooperation of the local community in Goto City, Nagasaki, we have participated in the floating offshore wind demonstration project of the Ministry of the Environment. Through this project we commenced and still continue to operate the "Haenkaze" (2 MW), Japan's first floating offshore wind turbine. Furthermore, we have been advancing the construction of floating offshore wind farms with the goal of creating a sustainable business that meets regional needs, including coexistence with the fishing industry and the preservation of the environment and local way of life.

Testing and development in laboratories and controlled sea environments

Commencement of initiatives in Goto

2007
1/100 scale
Two-dimensional water tank testing
(Kyoto University)



2008
1/20 scale
Deep-sea water tank testing
(National Maritime Research Institute)



2009
1/10 scale
Sea area testing under real-world conditions
(Sasebo City, Nagasaki Prefecture)



2010
Ministry of the Environment Demonstration project was commissioned (The waters off the Kabashima, Goto City)



*Demonstration project by Ministry of the Environment for floating offshore wind power generation

2012
1/2 scale
Small-scale testing unit
(100 kW) installed



2013
Demonstration unit Haenkaze (2 MW) is installed off the coast of Kabashima



2015
Demonstration unit Haenkaze is relocated off the coast of Sakiyama

2016
Demonstration project of the Ministry of the Environment comes to an end. Goto City Power Generation project started.

2018
Semi-submersible spud barge (Float Raiser)/multipurpose vessel completed



2021
Operator of the promotion zone in the waters off Goto City, Nagasaki Prefecture, (*) is named Goto City Offshore Wind Farm Project (16.8 MW)



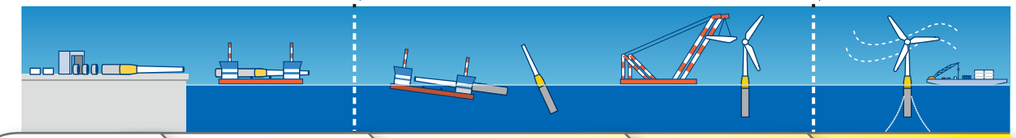
2026
Goto City Offshore Wind Farm Project commences operations (January)

*Promotion zone as set forth in the Act on Promoting the Utilization of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities

An optimal plan is formulated according to the local conditions for each project.

Wind Turbine Installation Procedure

Fukue Port Wharf (Floating Body Construction Yard) → Sea area north of Kabashima (Assembly Area) → Off the coast of Sakiyama (Installation Area)



① Floater fabrication → ② Rolling-on and Launching → ③ Floating-off and standing-up → ④ Wind turbine assembly → ⑤ Towing and mooring



At the floater fabrication yard located at Fukue Port's Otsu Wharf, steel blocks are joined and concrete rings are fabricated and assembled. The two sections are then joined to complete the hybrid-spar type floater. Steel blocks are transported from a factory in Nagasaki Prefecture, while ready-mix concrete for the concrete rings is procured from a local plant in Goto City.
The floater is then launched from the yard quay using a semi-submersible spud barge and transported to the waters north of Kabashima.











The transported floater is separated off the barge and stood up in the calm waters north of Kabashima, where it is temporarily moored.
Separately, domestically produced wind turbine components such as the nacelle and blades are assembled atop the tower to complete the floating offshore wind turbine.





Once assembly is complete, the floating turbine is towed from waters north of Kabashima to the designated installation site, where it is moored using three chain-and-anchor sets. Installation is then completed by connecting the dynamic power cable.

Goto Offshore Wind Farm consisting of 8 wind turbines

To celebrate our partnership with the local community, we named this project the "Goto Offshore Wind Farm." Since each of the eight turbines is registered as a ship, they were required to be named, and they bear names chosen by elementary and junior high school students in Goto City and Shin-Kamigoto Town. These names were inspired by the beautiful local scenery and culture, blending in elements of the wind and sea. We feel that each name is a wonderful expression of the children's creativity and their bright hopes for a sustainable future.



Haenkaze
May the southern winds sweeping through the Goto Sea—the "Haenkaze"—bring abundant blessings to Goto, to Japan, and to the entire world.

Unit 1: Kazeterasu (Wind Terrace)
May this wind power project light up the future of Goto and bring true prosperity to both the islands and all of Japan.

Unit 2: Camellia Breeze
It represents the wind turbines rotating gracefully in the breeze over the sea of Goto—where the camellia serves as a local symbol.

Unit 3: Gibaru Kaze (Striving Wind)
Surrounded by beautiful nature and abundant wind, we hope these turbines will "Gibaru"—the local Goto word for "try hard"—to power a bright future for our islands.

Unit 4: Goto Kaze (Goto Wind)
May the winds of Goto sustain our lives for generations to come, forever and always.

Unit 5: Sea Chotto
The name is a play on the word "Sea" and the local Goto dialect phrase "Shi-chotto," which means "I love you." We hope it becomes a presence that is deeply loved by everyone.

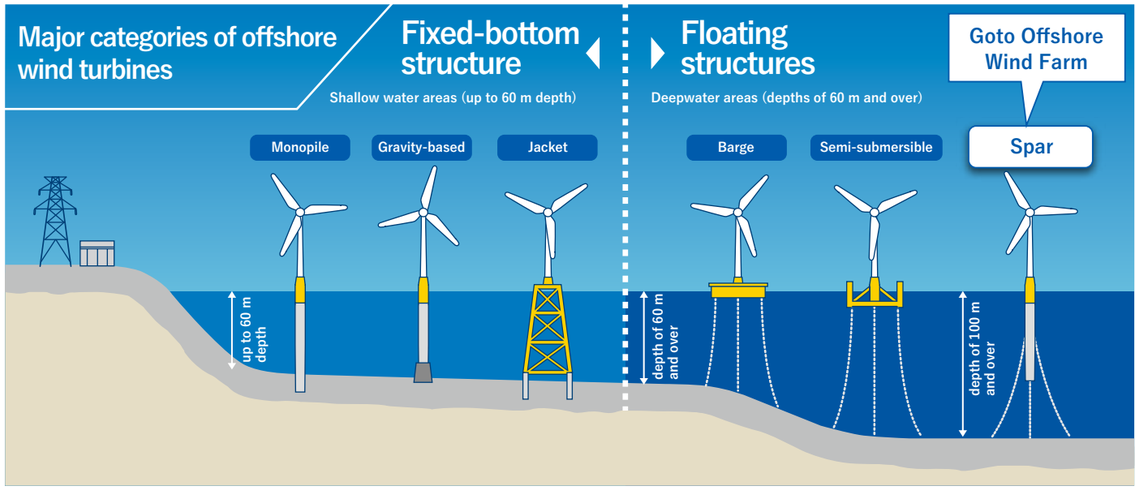
Unit 6: Baramon Kaze (Baramon Wind)
Just like the traditional "Baramon" kites of Goto that soar powerfully in the sky, we hope these turbines catch the wind and generate energy with vigor and strength.

Unit 7: Mijo Kaze (Mijo Wind)
By combining "Mijoka"—the local Goto word for "cute"—with "Kaze" (wind), we hope this name will inspire a sense of affection and become dearly loved by everyone.

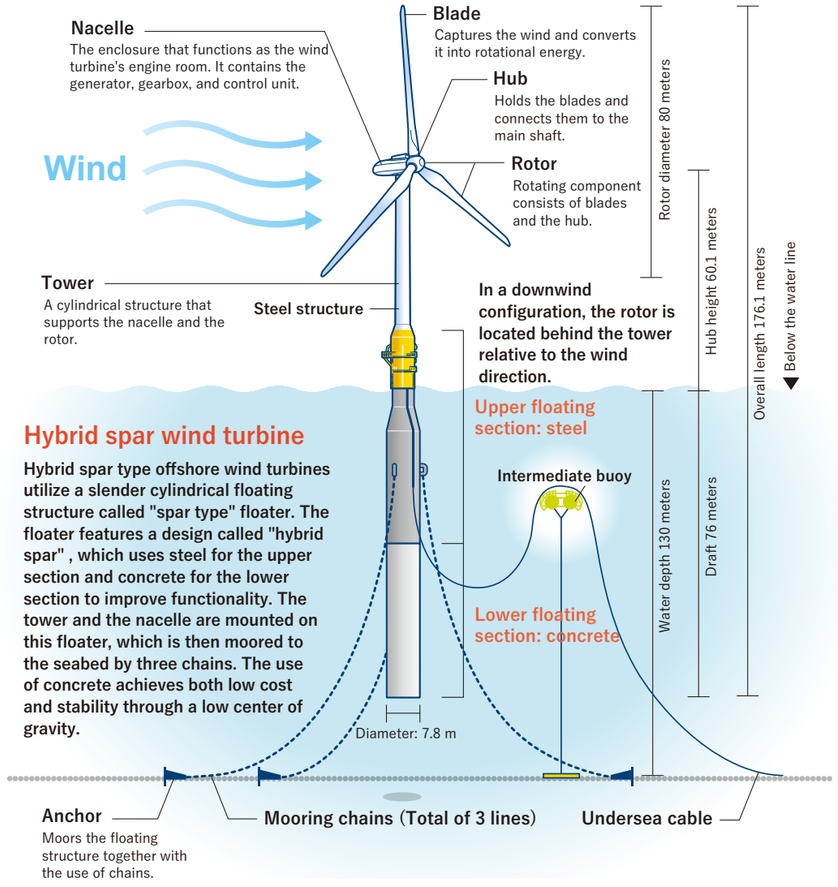
Unit 8: Mugen Kaze (Infinite Wind)
The number "8" symbolizes "Sue-hirogari"—a Japanese sign of prosperity spreading like a fan—as well as the mathematical symbol for infinity (∞). May the eighth turbine harness Goto's infinite winds to revitalize our future.

Offshore wind turbine foundation

≫ Offshore wind turbine structures



≫ Structure and features of the hybrid spar type offshore wind turbine



Downwind wind turbine

Hybrid spar wind turbine

Hybrid spar type offshore wind turbines utilize a slender cylindrical floating structure called "spar type" floater. The floater features a design called "hybrid spar" , which uses steel for the upper section and concrete for the lower section to improve functionality. The tower and the nacelle are mounted on this floater, which is then moored to the seabed by three chains. The use of concrete achieves both low cost and stability through a low center of gravity.

Simple structure

Contributes to standardization, mass production, and the cost reduction.

Stability improvement

By using a concrete structure for the lower floater, the center of gravity is lowered. The weathercock effect of the downwind rotor improves the stability of the floater in the yaw and pitch directions.

Low-cost design

Utilizing low-cost concrete and optimizing the placement of steel and concrete.

Fabrication with local partners

The steel components are sourced from manufacturers within Nagasaki Prefecture. For the concrete sections, materials from a local ready-mix concrete plant in Goto City are utilized.

Enabling construction on low-bearing-capacity quaysides

By constructing the structure horizontally, the weight per unit area is reduced, enabling construction on quaysides with limited ground strength.

Local Production and Local Consumption of Electricity / Operation and Management

≫ Local Production and Local Consumption

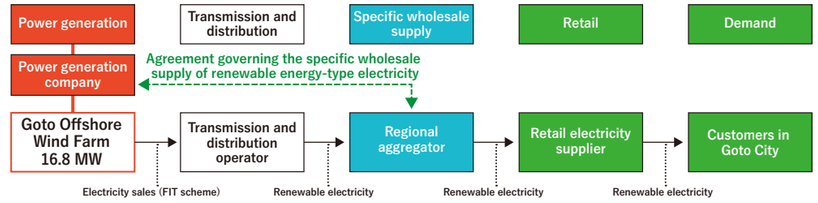
How the generated electricity is used

We deliver the offshore wind power generated at Goto Offshore Wind Farm directly to the customers within the local community, leveraging the Specified Wholesale Supply System(*)

*Specified Wholesale Supply: A scheme under which the power generation company supplies retail electricity suppliers with electricity for specific customers on a wholesale basis.

Our goal

We seek to harness large-scale renewable energy to achieve the local production of electricity for the local consumption and ultimately help Goto City realize its goal of becoming a Zero Carbon City.



≫ Operation and management of the offshore wind farm

Operation and Management

The facility is managed via 24/7 remote monitoring and operations. In the floating offshore wind sector, enhancing maintenance efficency and minimizing downtime after failures are critical for maximizing power production. The Goto Offshore Wind Farm utilizes the proven operational know-how accumulated from the demonstration turbine "Haenkaze" to achieve reliable, long-term performance.

Partnering with local businesses

Organizing an effective operations management system is key to achieving stable, long-term performance in offshore wind power. By partnering with local businesses to establish our maintenance network, the Goto Offshore Wind Farm is able to provide quick and efficient responses to any issues.

Goto Offshore Wind Farm Q&A

Q What is offshore wind power?

A It refers to the generation of electricity using wind turbines constructed at sea. Offshore wind power is categorized into two types based on the structure that supports the turbine: "fixed-bottom" and "floating"

Q What are the benefits of offshore wind power?

A It allows for more efficient power generation because the winds at sea are stronger and more stable than those on land. Placing turbines offshore also makes it easier to minimize noise and visual impact, while allowing for the construction of larger turbines. This method of power generation takes full advantage of Japan's characteristics as an island nation surrounded by the sea.

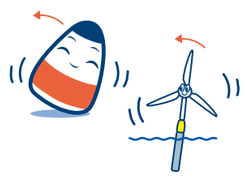
Q What is the power of a single floating wind turbine ?

A A single wind turbine has the capacity of 2.1 MW(2,100 kW) per unit.



Q Is there a risk of the floating turbine tipping over?

A No, it is designed like a "roly-poly toy" (Okiagari-koboshi). Because the center of gravity is located deep underwater, even if the turbine tilts due to the wind, it is engineered to right itself and return to its original upright position.



Q Why "Floating" Offshore Wind?

A Japan has limited flat land, and suitable locations for onshore wind power are scarce. While surrounded by the sea, there are few shallow areas (water depth of 60 m or less), which limits the sea areas where "fixed-bottom" turbines can be installed. To address this, Toda Corporation developed the "floating" type, where the turbine is mounted on a floating structure secured to the seabed with chains. This can be installed in deep offshore waters, making it easier to reduce the impact on daily life, such as noise and visual aesthetics.

Q What happens during a typhoon?

A When wind speeds exceed a pre-set threshold, the system automatically adjusts the pitch of the blades to be parallel to the wind direction. This allows the wind to flow past the blades without pushing them, while the rotor remains in an idling (free-spinning) state.



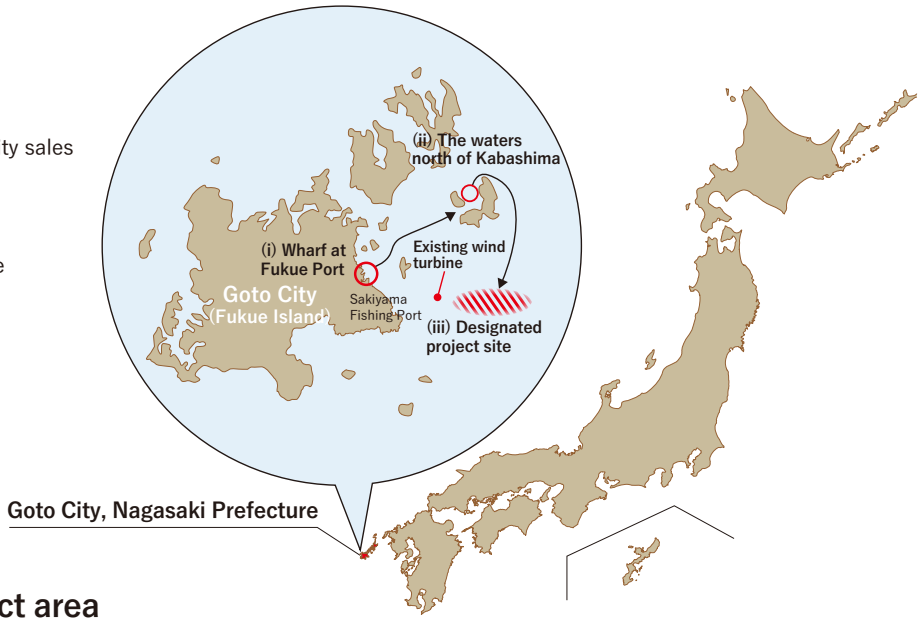
Q How much does a single floating wind turbine weigh?

A It weighs approximately 3,500 tons. The floating structure is hollow, and ballast material is placed in the bottom to maintain balance and stability.

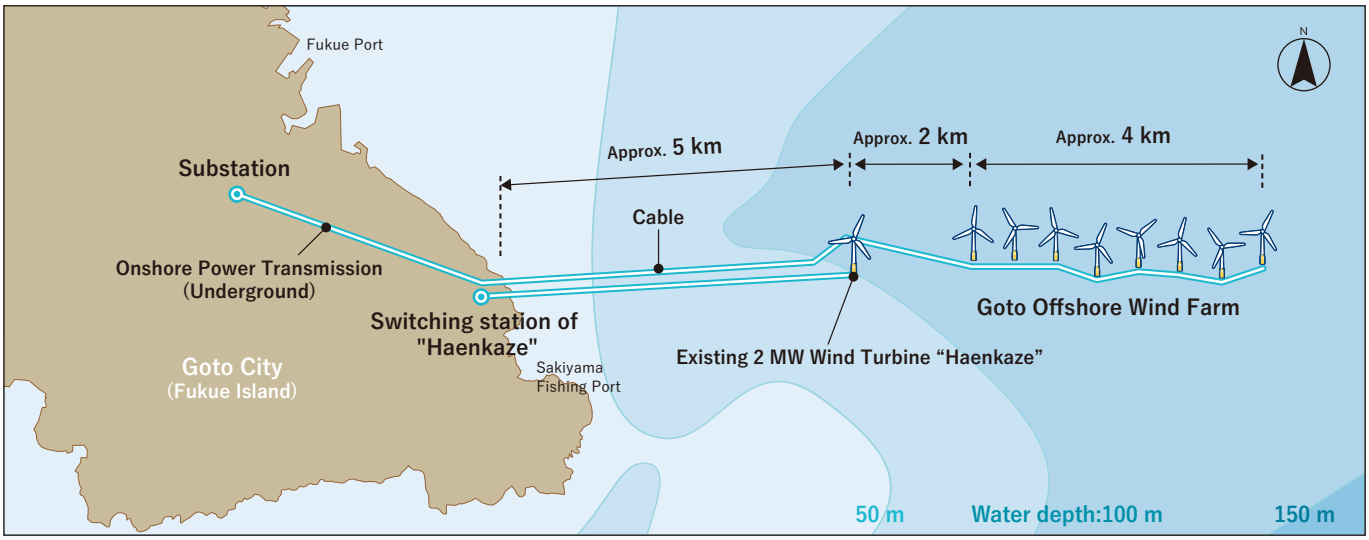


■ Project overview

Project Name: Goto City Offshore Wind Farm Project
Project Owner: Goto Floating Wind Farm LLC.
Project Objectives: Wind power generation and electricity sales
Capacity: 16.8 MW (2.1 MW per unit x 8 units)
Floater structure: Hybrid Spar
Wind turbine type: Downwind
Location: Off the coast of Goto City, Nagasaki prefecture
Commercial Operation Date: January 2026
Investors: TODA CORPORATION (Representative Firm), ENEOS Renewable Energy Corporation, OSAKA GAS CO., LTD., INPEX CORPORATION, The Kansai Electric Power Co., Inc., and Chubu Electric Power Co., Inc.



Layout of wind turbines in the project area



■ Project initiatives





2018 Completed the Environmental Impact Assessment (EIA) and received the official notification of the final assessment report.

2020 The waters off Goto City, Nagasaki, were designated as a Promotion Area under the Act on Promoting the Utilization of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities and the public tender was launched.

2021 A consortium led by TODA Corporation was selected as the business operator, and Goto Floating Wind Farm LLC was established.

2022 Obtained the maritime area occupancy permit and commenced offshore construction.

2025 Completed the installation of all eight wind turbines in the project area.

2026 Commenced commercial operation (COD)

Contact us

TODA CORPORATION

URL: https://www.toda.co.jp/