



Green energy for Taiwan

Powered by people

Case Study: The socio-economic value created by Ørsted's Greater Changhua 1 and 2a Offshore Wind Farms



This paper shares our experience of building the Greater Changhua 1 and 2a wind farms. It provides evidence of a track record of creating thousands of jobs, strengthening local industries, and nurturing new talent with skills development."

Per Mejnert Kristensen
President of Ørsted Asia Pacific

⤴ The 900 MW Greater Changhua 1 and 2a offshore wind farm are the largest of its kind in Asia Pacific and the first full-scale wind farms in Taiwan



Foreword

As a leading global renewable energy company, we want to drive a sustainable build-out that works for people.

At Ørsted, we know we can only be successful in accelerating the green transition in Asia Pacific if we have the support and trust of the communities where we work – communities in which we'll be present for decades to come.

This case study tells the story of Ørsted's 900 MW Greater Changhua 1 and 2a offshore wind farms in Taiwan. This project was selected and awarded grid capacity by the Taiwan government in April 2018 and inaugurated in April 2024, overcoming many predictable and unpredictable challenges along the way.

At the time of completion, it is the largest offshore wind farm in Asia Pacific and Ørsted's first large-scale project in the region. As one of the first utility-scale projects, it has been delivered under a framework intended to launch an entire new industry in Taiwan.

With our end-to-end business model, we are committed to owning and operating the assets we build. We are therefore always focused on the long-term economic viability of the industry and communities.

This paper shares our experience of building the Greater Changhua 1 and 2a wind farms. It provides evidence of a track record of creating thousands of jobs, strengthening local industries, and nurturing new talent with skills development. We are proud to have shared our 30+ years of experience in offshore wind with our local partners and created quality jobs in an industry of the future.

These world-class wind farms will provide a stable source of renewable energy to power homes and businesses, supporting Taiwan to remain competitive in global green supply chains.

I would like to thank the thousands of people involved in completing this project and I extend my appreciation to our friends across Changhua communities and the authorities at all levels in Taiwan.



Per Mejnert Kristensen
President of Ørsted Asia Pacific

Executive Summary

This case study describes how APAC's first near gigawatt-sized offshore wind project has created long-term socio-economic value in Taiwan through the development, construction, and operations phases to date.

We describe the investments Ørsted has made and examine the quantitative results of value creation and the qualitative testimony of key stakeholders.

The evidence shows that substantial economic benefits have been generated through the development of local supply chains, job creation, talent cultivation and initiatives to support livelihoods in local communities.

The wind farms are expected to produce clean energy enough to power more than a million households per year, equivalent to 1.75 million tonnes of carbon reduction.

Summary of results

Economic value



523 NTD billion

Added value contributed to Taiwan's economy

60 NTD million

Industrial Development Fund supported 33 companies and 200 people

5,300 contracts

300 direct and 5,000 indirect supply chain contract, 1,200 local supply contracts

8,300 jobs

1,100 direct and 7,200 indirect jobs created during construction

200+ suppliers

worked with more than 200 local suppliers

1m homes

Power 1 million households every year

First in Taiwan



210 pin piles made by Taiwanese suppliers

75 nacelles final clicking assembled

6 jacket foundations 100% made-in-Taiwan

Societal and Environmental value



1.75 million/t

1.75 million tonnes of CO₂ reduced each year

25 recipients

– of scholarship program

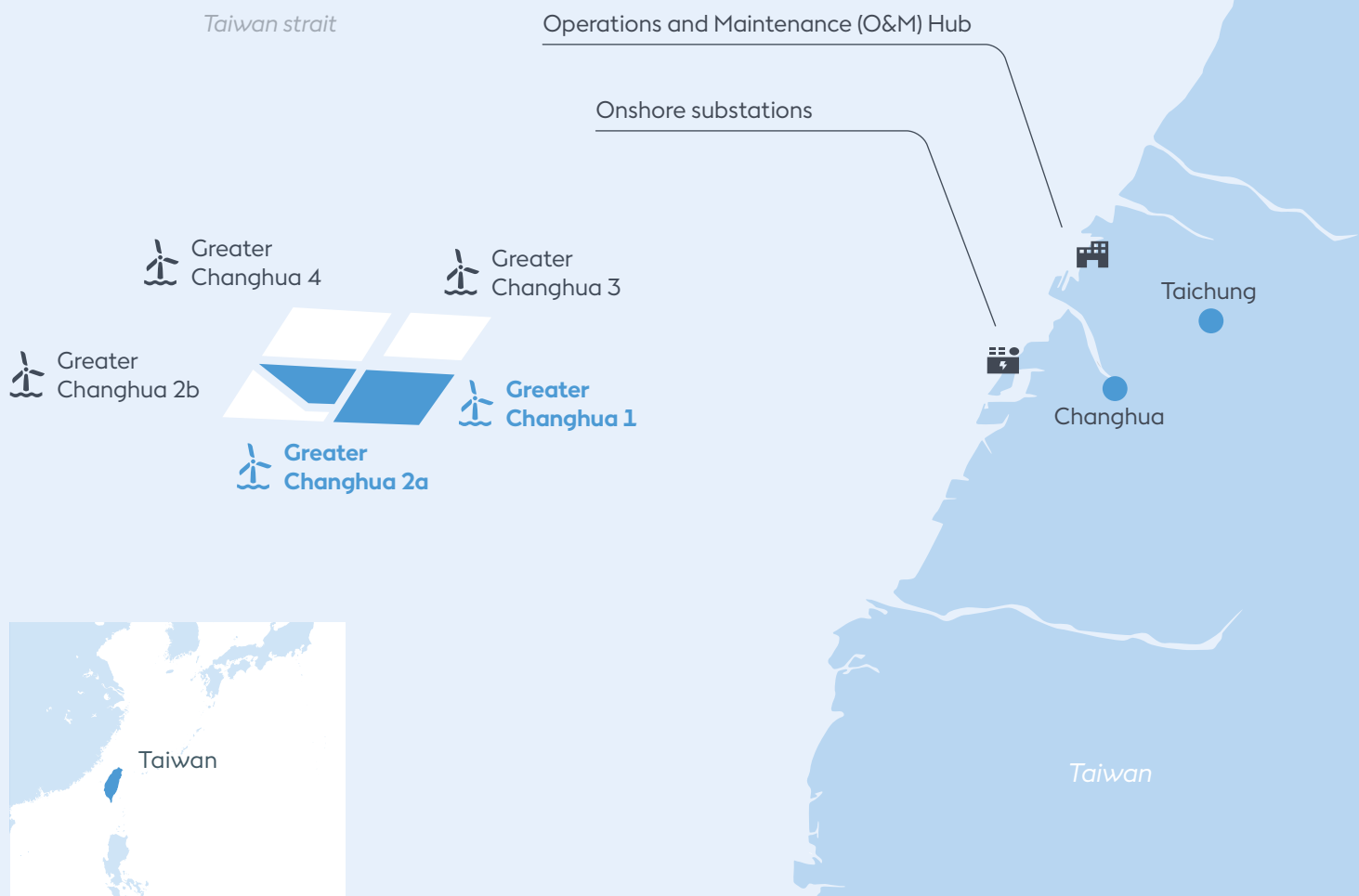
750 children

Aged 11-12 years have learned from green energy curriculum

Greater Changhua 1 and 2a offshore wind farms

Key facts

Location	35-60 kilometres off the coast of Changhua County, Taiwan
Number of turbines	111 turbines of nameplate capacity 8 MW
Area	170.98 km ²
Water depth	23.8-44.1 metres
Overall capacity	900 MW
Timeline	Grid capacity awarded April 2018, full commercial operation 2024.
Ownership of Changhua 1	Caisse de dépôt et placement du Québec (CDPQ) and Cathay Private Equity (50%), Ørsted (50%)



Greater Changhua 1 and 2a offshore wind farms

Ørsted is the global leader in offshore wind, with by far the largest installed capacity and the largest number of new projects among offshore wind developers.¹

The Greater Changhua 1 and 2a offshore wind farms were awarded 900 MW grid capacity by the Taiwan government in April 2018, via the project selection scheme (Phase 2 Zone Application for Planning).

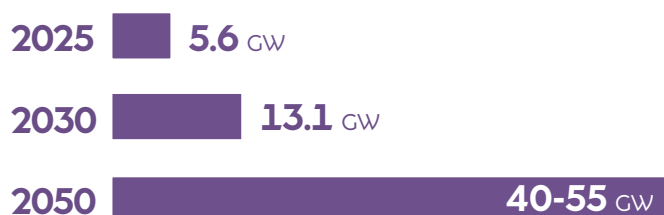
The project is located 35-60 kilometers off the coast of Changhua County, at mid-west of Taiwan. It consists of 111 Siemens Gamesa 8.0-167 DD wind turbines of 8 MW nameplate capacity. It is the largest offshore wind farm in Taiwan, and ready to power more than a million

households every year. Ørsted partners with CDPQ and Cathay PE as co-owners of the Greater Changhua 1 offshore wind farm. See the [back page](#) for more information.

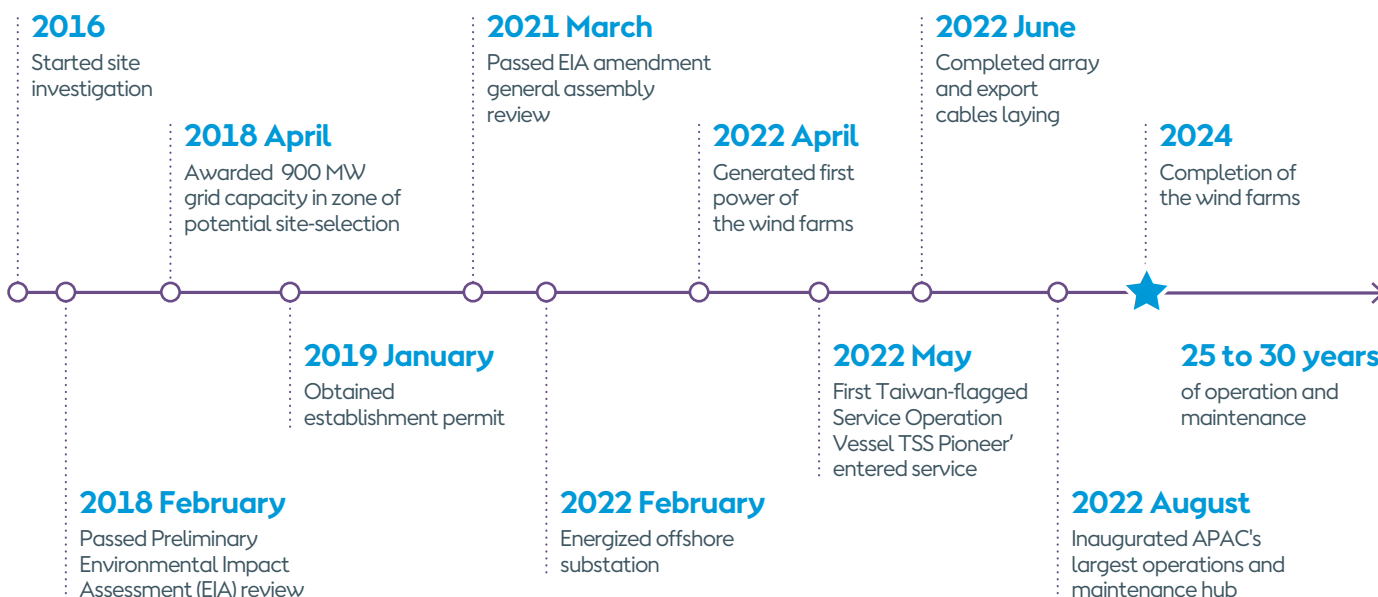
Regulatory Framework

The Taiwanese Government has a policy target to achieve 15.5% renewable energy in the energy mix by 2025, followed by 44% renewable energy by 2050.²

Its renewable energy policy includes offshore wind power capacity installation target of:



Project milestone



1. Outside China 2. Develop offshore wind energy and make Taiwan as the powerhouse of Asia ([ey.gov.tw](#))

3. Accelerate the development of renewable energy development to maximize green energy buildouts and step-by-step achieving energy transition ([ey.gov.tw](#))

The policy framework of offshore wind development consists of three phase

Phase 1: 2017-2019

Demonstration Incentive Program

Subsidized wind farms:

- Formosa 1 (128 MW)
- Taiwan Power Company-led Changhua Phase 1 Offshore Wind Farm (109.2 MW).

Phase 2: 2020-2025

Zone Application for Planning

- Allocated 5.5 GW grid capacity to 10 offshore wind farms
- Grid capacity awarded through selection or auction scheme.

Phase 3: 2026-2035

Zonal Development

Open for developers to submit project applications which satisfy qualification requirements, and award projects based on tender criteria.

A Feed-in-Tariff (FiT) price regime and local content requirements were central to the Phase 2 project selection scheme.

The FiT regime provides an attractive electricity price as a financial incentive alongside conditions for mandatory local content requirements to source from local suppliers.³

This FiT regime aimed to deliver a political mission to build and ramp up local supply chain from scratch. The 900 MW Greater Changhua 1 and 2a offshore wind farms were awarded under this framework and play a crucial role in Taiwan's offshore wind story.

Greater Changhua Offshore Wind Farms



Create Socio-economic Value that benefits Local Community

Offshore wind projects create socio-economic value in a variety of ways which can be classified as direct, indirect, and induced effects.

Direct effects

Direct socio-economic effects refer to the immediate and measurable impacts of a particular economic activity, policy, or intervention on a specific group or sector of society. For example, the opening of a new factory would create direct effects such as the creation of new jobs, increased income for local workers, and an increase in economic activity within the region.

Offshore wind projects require a range of skills and expertise, including engineering, project management, operations and maintenance, and environmental monitoring. As a result, the industry can create a significant number of jobs related to both the construction of assets, but also to the expected 25-year operational phase. This results in direct employment.

On top of the direct socio-economic benefits relating to development, construction and operational phases of offshore wind projects, these projects also generate significant revenue for governments through taxes and other fees. This revenue can be used to support public services, infrastructure development, and other socio-economic priorities.

Indirect effects

Indirect socio-economic effects, on the other hand, refer to the ripple effects that an economic activity or policy may have on other sectors or groups within the economy. For example, the opening of a new factory may result in increased demand for raw materials, transportation services, and other support services. This can lead to increased economic activity in other sectors and indirectly create new job opportunities.

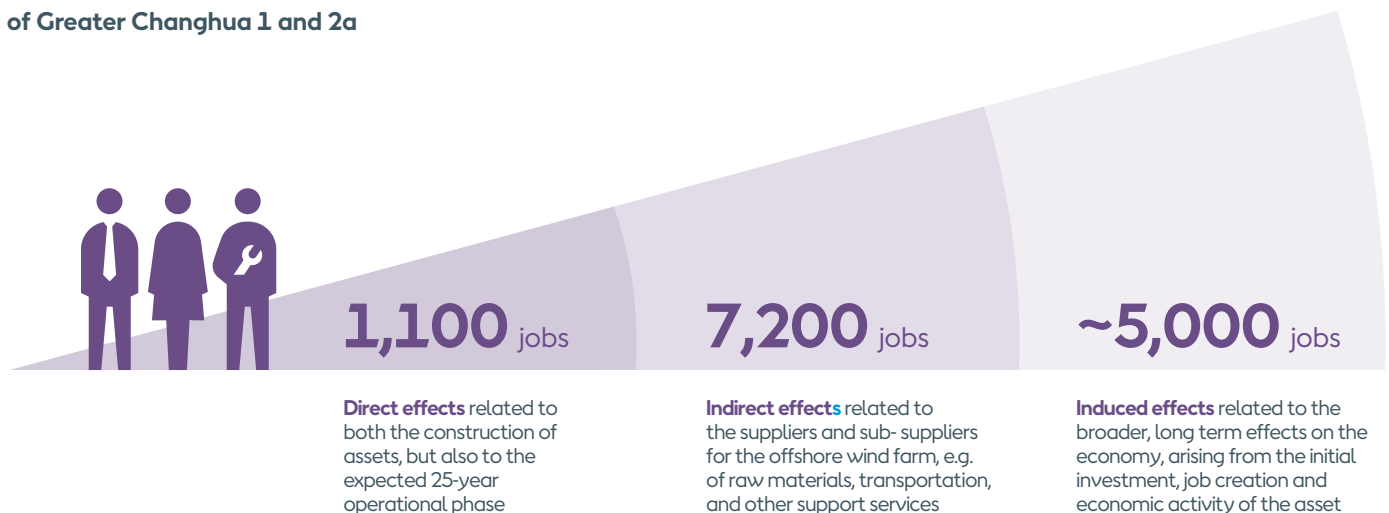
As part of the production, tier 1 suppliers will often choose to invest in local production facilities if the pipeline of projects justifies this from a commercial perspective.

Induced effects

Induced socio-economic effects refer to the broader and longer-term impacts that an economic activity or policy may have on the overall economy, including changes in consumer behaviour, changes in the level of investment, and changes in the overall economic structure.

For example, the opening of a new factory may lead to an increase in demand for goods and services in the local area due to increased local employment, which may in turn lead to the growth of new businesses and an overall improvement in the economic well-being of the region over time.

Direct, Indirect, and Induced job creation of Greater Changhua 1 and 2a



In summary, direct effects are the immediate and observable impacts of a particular activity or policy, while indirect effects are the ripple effects on other sectors of the economy, and induced effects are the broader and longer-term impacts on the economy.

Ørsted has delivered beyond regulatory requirements when building Greater Changhua 1 and 2a and has aimed for long-term effects benefitting the offshore wind industry in Taiwan and local community in the Changhua area.

The Greater Changhua 1 and 2a project has created direct, indirect, and induced effects for local community in Taiwan by growing local supply chain capacity, nurturing talent, technologies, and strategic social programs. We will describe these initiatives and the value creation results in this paper.



↑ Ørsted cultivated new market-entrant local suppliers from ground zero to build up their capabilities in manufacturing offshore wind heavy steel components

Economic value creation

– from building the Greater Changhua 1 and 2a offshore wind farms

Job Creation and Local Talent Cultivation

Direct and indirect job creation

During the construction of Greater Changhua 1 and 2a, we have worked with more than **200 local suppliers** and sub-suppliers, generated **1,100 direct jobs** and more than **7,200 indirect jobs** during the construction phase, associated with major components including foundations, substations, and wind turbine generators.⁴

Moreover, Ørsted set up our APAC headquarters in Taiwan in 2016. The Greater Changhua 1 and 2a project has also contributed to increased employment for Ørsted across this region. In Taiwan, 88% of Ørsted employees are local hires.⁵

We believe nurturing a professional offshore wind workforce is as important as sourcing local content for the supply chain in Taiwan.

Direct and indirect job creation of Greater Changhua 1 and 2a is therefore weighted more than the face value but as a catalyst for offshore wind power in Taiwan.

Building a local Operations and Maintenance (O&M) team in Taiwan

With our industry leading build-to-operate business model, Ørsted began O&M deployment in 2018 with a strategic plan to establish full-scale operations, which was an unprecedented industrial practice in Taiwan. This includes a Taiwanese operations team, the world's first Taiwan-flagged customized service operation vessel (SOV) and APAC's largest new-build offshore wind operation facility in the Port of Taichung.

The 'Ørsted Taiwan Offshore Wind Farms O&M Center' is the first operations facility with certified green design⁶ and the largest in terms of size and offshore service capacity in the Asia-Pacific region. It's built with the aim of serving four Greater Changhua offshore wind farms with a combined potential capacity of approximately 2.4 GW.



Building a local O&M team



⤴ Ørsted Taiwan Offshore Wind Farm Operation and Maintenance Hub at the Port of Taichung



⤴ First Taiwan-flagged Service Operation Vessel (SOV) 'TSS Pioneer'

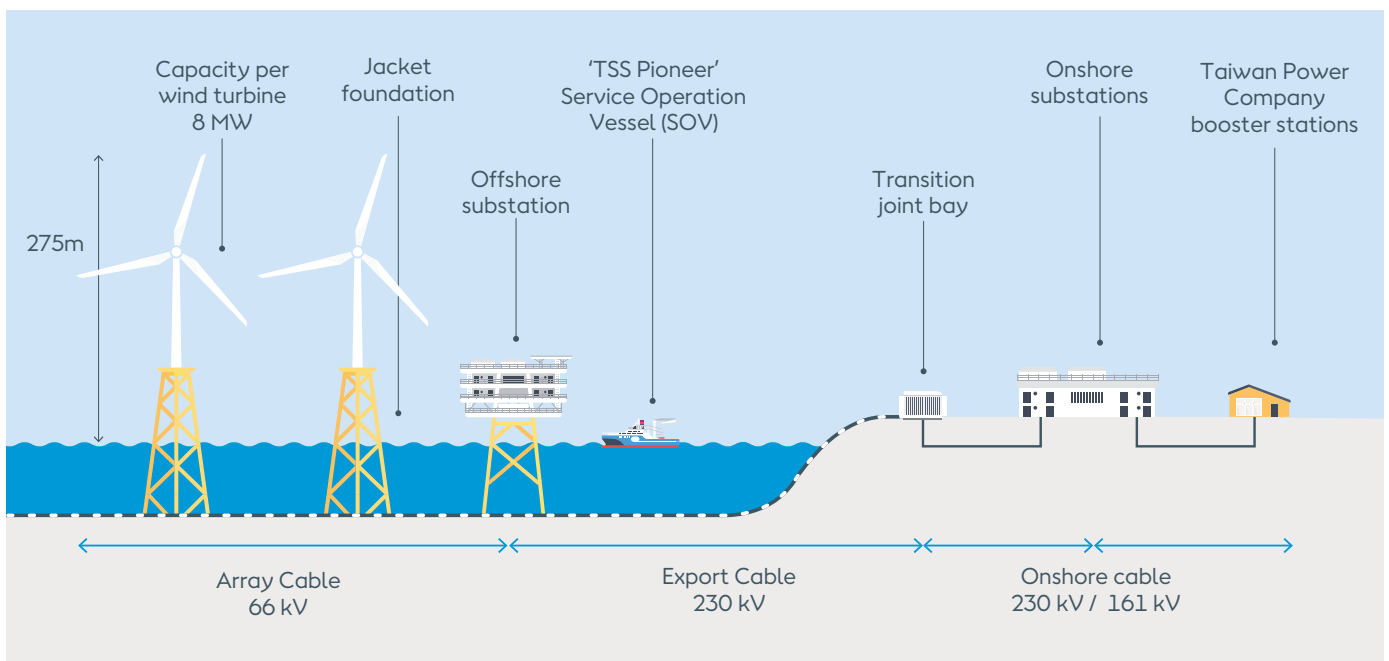
We have also recruited and developed an almost entirely local operations team comprised of more than 40 operational personnel and wind farm technicians with responsibilities including wind turbine generators, high voltage and balance of plant (BoP) works. O&M jobs are long-lasting employment expected to serve more than two decades wind farm lifespan.

The deployment of the bespoke SOV, TSS Pioneer, is at the core of our capabilities to perform reliable and efficient O&M services to the highest levels. 'TSS Pioneer' is the first Taiwan-flagged SOV customized to meet the specific

requirements of the Greater Changhua offshore wind farms and Taiwan Strait conditions. It also represents new opportunities for local vessel suppliers to gain experience in marine engineering, operations, and cultivate local talents for the O&M phase of offshore wind farms.

With the completion of Greater Changhua 1 and 2a project, the local O&M team is dedicated to ensuring the optimal performance of the largest-ever offshore wind farm in Taiwan, providing a stable supply of clean energy for decades to come.

Greater Changhua 1 and 2a wind farms scope



Supply Chain Development

The Greater Changhua 1 and 2a project generated more than 300 direct contracts and more than 5,000 indirect contracts, across major components that make an utility scale offshore wind farm.

Realizing local content requirements

The Greater Changhua 1 and 2a offshore wind farms have sourced locally which has paved the way for Taiwanese companies to gain manufacturing experience, as well as working in partnership with the international offshore wind industry.

We are proud to share several examples:



Wind turbine towers

The 111 wind turbine towers in the Greater Changhua 1 and 2a offshore wind farms were manufactured in collaboration with Changhua-based local supplier Chin Fong Machine Industrial and Korean supplier CS Wind at the Port of Taichung. Each tower is comprised of three sections, and all 333 tower sections were 100% made in Taiwan.



Pin piles

333 pin piles were used for the Greater Changhua 1 and 2a project - each of the 111 foundations is supported by three pin piles. Taiwanese and existing suppliers completed all 333 pin piles, 210 of them were fabricated by the new entrant Taiwan local suppliers, Century Wind Power (CWP), CSBC, and Formosa Heavy Industry Corporation (FHIC).



Offshore wind turbine nacelle assembly facility

Ørsted contracted Siemens Gamesa Renewable Energy (SGRE) for the 111 SG 8.0-167 DD wind turbines.

As part of the contractual agreement and encouraged by Ørsted, Siemens Gamesa committed to accelerating a local nacelle assembly facility, which was inaugurated in September 2021.

The facility is the first of its kind in the Asia-Pacific region as well as the first outside of Europe. Its primary task is to deliver locally assembled nacelles. It completed the vast majority of the 111 wind turbine nacelles. This investment spearheaded further expansion of the facility to deliver more and advanced nacelles for other offshore wind farms and create local jobs.



Ship Construction and maritime services

Ørsted supports local vessel companies. We signed a 15-year contract with Ta San Shang Marine Co. Ltd., a joint venture of Taiwan's Ta Tong Marine Group and Japan's Mitsui O.S.K. Lines, to build the world's first-ever Taiwan-flagged bespoke service operation vessel (SOV) which was delivered in 2022.

The SOV weighs 5,872 tonnes and can safely withstand up to 2.5 meters in wave heights. The vessel includes 60 single cabins for Ørsted O&M technicians and 27 cabins for the vessel crew.

Ørsted has also chartered five Taiwan-flagged crew transfer vessels (CTV). These contracts help the local vessel companies build up experience and capabilities to serve future offshore wind projects.



[Check the video of our story with suppliers](#)



Jacket foundations

Sing Da Marine Structures (SDMS), a new entrant to the offshore wind industry and Taiwan supplier, delivered six jacket foundations, which were 100% made in Taiwan for the Greater Changhua 1 and 2a offshore wind farms.

Each tailor-made jacket foundation weighs more than 1,200 tonnes with a height of 70~80 meters, approximately as high as 20~30 stories building. These gigantic underwater structures are custom designed to meet the specific weather and seabed conditions to ensure the wind farm can operate for at least 30 years.



Onshore power facilities

Local supplier Chung-Hsin Electric (CHE) and Fortune Electric Corporation (FEC) supplied high-voltage switchgears and transformers, power distribution panels to the Greater Changhua 1 and 2a project's onshore substations.

Through this collaboration, we successfully worked with local Engineering, Procurement and Construction (EPC) contractors and subcontractors to build a world-class transmission hub which meets international offshore wind standards of quality, health, safety, and environment (QHSE).

Going extra miles: the Industrial Development Fund

Taiwan's offshore wind industry is on course to grow from 128 MW in 2019 to 5,500 MW by 2025. This is the equivalent of more than 40 times capacity growth within 6 years. Ørsted has initiated programs to enable and nurture local supply chain which are complementary to fulfilling local content policy requirements.

In 2020, Ørsted Taiwan partnered with the Metal Industries Research & Development Center (MIRDC) for the Industrial Development Fund (IDF) to support the ramp up of

technological capabilities of local sub-suppliers with good potential and nurture local talent.

Ørsted Taiwan provided funding of NTD 60 million and resources of experts to facilitate and coach candidate corporations to upgrade and expand technical and manufacturing capacity satisfying offshore wind industrial standards. The candidates were selected by criterion of market competitiveness, industrial benefits, and project feasibility.

As a result, 33 companies and 200 people were funded by the IDF, including 9 companies awarded funding for research projects⁷, 82 people were certificated as advanced welding technician, and 108 people have completed Global Wind Organization (GWO) basic safety training with certification.

The IDF concluded successfully in 2022, having made a substantial contribution to local supply capacity development in Taiwan. Companies and professionals supported through this initiative have supplied services to our Greater Changhua wind farms or to other offshore wind projects. For example, Tai-Shing Engineering and Construction (TS-EC Ltd.) recently invested NTD 500 million for new pin pile and jacket leg production lines in Changhua.⁸

Economic value created from building the 900 MW wind farms

Contribution to the domestic economy

The Taiwan Institute of Economic Research (TIER)⁹ was commissioned by Ørsted in February 2024 to analyse project data to make assessments on the contribution to the domestic economy.

TIER concluded that:

- The development and construction activities of the 900 MW project has created and contributed **NTD 402 billion worth of industrial value**. This includes ripple effects across multiple industrial sectors such as manufacturing of metals, construction, and engineering activities.
- By taking into account the induced consumption¹⁰ effects, the project ultimately created **NTD 523 billion worth of economic value**.
- Overall, the 900 MW project has contributed **NTD 189 billion GDP** (Gross Domestic Product) over six years to Taiwan's economy. This represents 0.14% of the baseline year 2023.

Methodology

TIER adopted the concept of Interindustry Relations¹¹ and Input-Output Model¹². It took into account activities including supply chain development, procurement and contracting, fees for regulatory requirements, financial services, grid access and resilience enhancement.

7. orsted.tw/en/news/2021/01/idf-awardee 8. Tai-Shing Engineering and Construction invests NTD 500 million for three major projects including facility expansion (ltn.com.tw)
9. The Taiwan Institute of Economic Research (TIER) is a respected academia research institution and economic policy think tank. Visit: english.tier.org.tw
10. Arnold, Roger A. (2015). "The Consumption Function". Economics (12th ed.). 11. Allen, R.G.D. (1959). Inter-Industry Relations. In: Mathematical Economics. Palgrave Macmillan, London. doi.org/10.1007/978-1-349-81547-0_11. 12. Wassily Leontief (1951), Input-Output Economics. Scientific American, Vol. 185. No. 4. [jstor.org/stable/10.2307/24945285](https://www.jstor.org/stable/10.2307/24945285)

Coexistence with fisheries and communities

Active engagement and efficient mutual communication

Community engagement is a critical part of project development. At Ørsted, we set out to develop an industry framework to deliver lasting benefits for society.

Fishing coexistence during offshore wind farm construction and operation

The local fishing industry and communities are some of our most important stakeholders. Ørsted employs a Marine Affairs Officer and Local Stakeholder Manager responsible for directly engaging with the communities to ensure open communication and access.

Coexist with fishing activities by reinforcing safety practices

When offshore wind construction and fishing activities occur in shared marine space, timely communications and standardized practices are crucial for marine operation safety.

The Greater Changhua 1 and 2a project actively avoids and mitigates these risks by reinforcing 'near real-time' communication with the fishers.

“Understanding and respecting local fishing culture, and prioritizing early and continuous communication are the key to effective fishery engagement.”



Peter Hua
Senior Marine Affairs
Officer, Ørsted Taiwan

The Taichung Fishery Radio Station plays a crucial role as an interface between fishing vessels and other working vessels in Changhua area. In 2021, Ørsted made a donation to the Station including Global Positioning System (GPS), Automatic Identification System (AIS), and Electronic Chart System (ECS) to enable timely marine coordination between fishermen and our crew working in the ocean.

In addition, we have hired local fishing vessels to guard offshore wind farms during construction to prevent collision risks. This initiative provided extra job opportunities and enhanced construction safety simultaneously.

Overall, only five cases of fisheries conflict incidents occurred during Greater Changhua 1 and 2a offshore wind farms construction phase from 2022-24. Risk has been further mitigated through the donation of marine coordination equipment to access the Taichung Fishery Radio Station service.

Marine mammal observer training program

Ørsted has adopted the standards of the Marine Mammal Observer Association (MMOA) and the United Kingdom's Joint Nature Conservation Committee.

We prioritize recruiting local fishermen to the program and support them to be qualified for domestic certifications to serve as marine mammal observers (MMO) at our offshore wind farms as well as other wind farms in Taiwan. See the case study video here.¹³

Building skills and talent pool which enabling local community

Ørsted has developed a series of region and market specific initiatives designed to develop local talents to access career opportunities with Ørsted or our suppliers. This includes:

Community Benefit Fund

Once commercial operation is commenced, for every KWh electricity generation, the Greater Changhua 1 and 2a Offshore Wind Farms contributes NTD 0.018, which will accumulate millions of New Taiwanese Dollars every year to the Community Benefit Fund.



⤴ Marin Mammal Observer (MMO) in action

The fund is designated for community livelihood rejuvenation, fishery resources restoration, and other effective coexistence initiatives.

Sponsoring Class B seafarer training and certification program

Ørsted fully sponsored a Class B seafarer training and certification program in 2023. This granted priority to recruiting fishermen and young individuals from Changhua and Taichung area.

A total of 18 trainees have completed a comprehensive 392-hour course, satisfying legal requirements for Class B seafarer in navigation science, assistant duties, and on-duty navigation. They have qualified for Class B seafarer certification, along with certificates for security responsibilities and security awareness.

Green Energy Scholarship Program

Ørsted launched the Green Energy Scholarship Program (GESP) in 2019, as part of our local stakeholder engagement program.

The mission of GESP is to offer an opportunity for Taiwanese youth to pursue undergraduate, master or doctoral degree in their chosen academia fields. The scholarship grants each individual applicant up to NTD 400,000 for tuition, accommodation costs and personal living expenses.

In addition, the scholarship prioritized for applicants from Changhua County as Ørsted's offshore wind farms are based in the administrative area.

From 2019 to 2022, a total number of 25 students were awarded a scholarship. We look forward to continuously supporting young generations in Taiwan to pursue their future in green energy.

Incubate novel solutions: Sustainability Innovation Accelerator (SIA) Program

In January 2024, Ørsted launched the Sustainable Innovation Accelerator (SIA) in collaboration with the Metal Industries Research & Development Centre (MIRDC).

The initiative calls for students and professionals to submit innovative proposals as solutions to conventional challenges and evolve the offshore wind industry for more sustainable practices.

The SIA program provides a total prize of NTD 450,000 to shortlisted teams, and up to NTD 500,000 to the winning team at final competition.¹⁴



⤴ Green Energy Scholarship Program

14. The Ørsted Sustainable Innovation Accelerator competition (orsted.tw)

Apprenticeship Program partner with Da-Yeh University

Ørsted partnered with Da-Yeh University for the Apprenticeship Program. It aims to support young talent to enter the offshore wind industry.

The program offers classroom-based courses on engineering, electricity, mechanic, and hydraulic fundamentals, as well as on-the-job experience shadowing Ørsted experts working at the Greater Changhua 1 and 2a offshore wind farms.

Green Energy Syllabus

In 2022, Ørsted partnered with National Changhua University of Education (NCUE) for the Green Energy Syllabus initiative.

This initiative seed trained teachers from more than 30 elementary schools to share relevant green energy knowledge with more than 750 elementary school children. The seed teachers have become the pioneers of green education in Changhua.

Industry-Academia Collaboration in energy storage and wind power measurement

As part of the collaboration program between Ørsted and NCUE, a megawatt-scale energy storage system was set up in 2020 at NCUE's campus to optimise on-campus energy efficiency and smart grid research.

In addition, Ørsted inaugurated the Dual-Doppler Radar System offering wind and weather observational data to the six academic research partners. This included National Taiwan University, National Central University,

Chinese Culture University, Industrial Technology Research Institute, Technical University of Denmark, and SmartWind Technologies.

Building Green Energy that Revives Nature

Decarbonize the grid in Taiwan

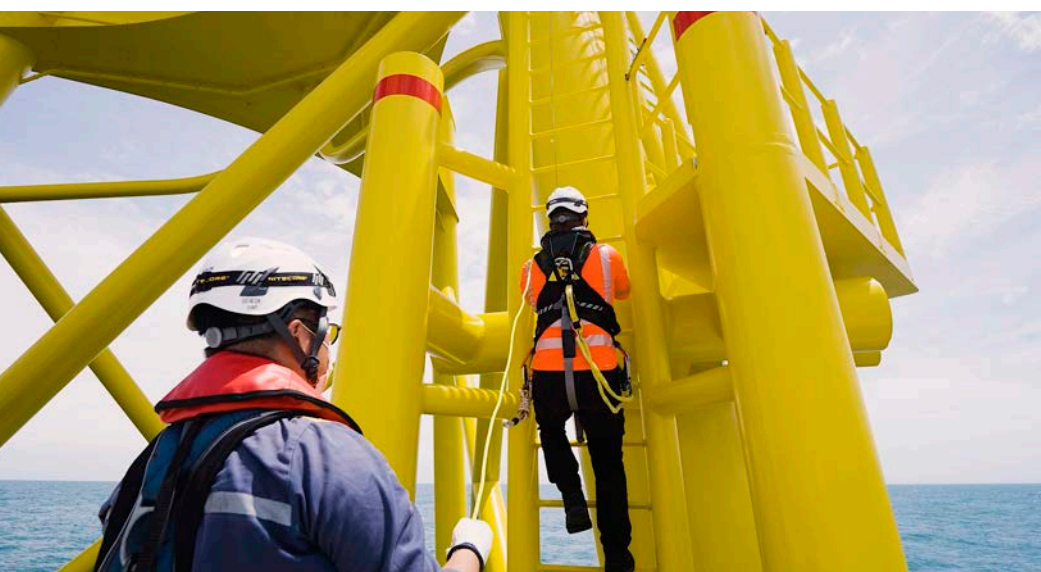
The 900 MW Greater Changhua 1 and 2a offshore wind farms consisting of 111 SG 8.0-167 DD wind turbines, generate clean electricity, which is the equivalent of reducing 1.75 million tonnes of CO₂ emissions every year.

The annual amount of clean electricity equals to carbon sink volume of 13,500 Daan Park in Taipei.¹⁵ It contributes to improvement of domestic air quality and energy sector decarbonization.

From No Net Loss to Net-Positive

As a global leader in offshore wind industry, Ørsted has accumulated over 30 years of experience in managing environmental impact. From avoiding, mitigating, and monitoring the disruption on habitat and species induced by wind farm development activities.

We deeply understand the importance of biodiversity in climate adaptation, as well as the uniqueness and abundance of Taiwan's ecosystem.



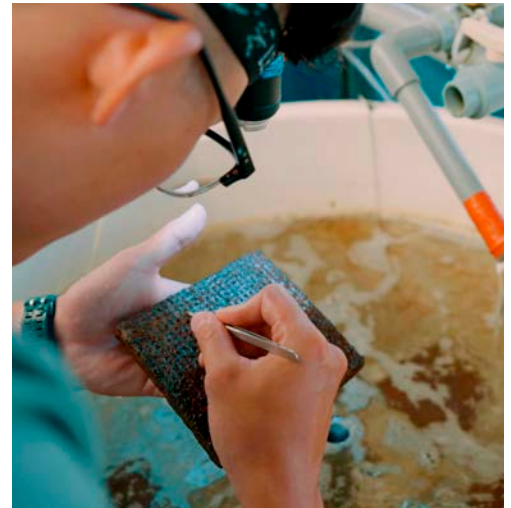
Greater Changhua 1 and 2a offshore wind farms has entered the operation and maintenance phase that would last at least more than 30 years



Check out the mini documentary:
ReCoral by Ørsted™: giving corals a home on our offshore wind farms ([youtube.com](https://www.youtube.com/watch?v=tKJP1f8CYfI)).¹⁷
As part of Ørsted Biodiversity Program, we believe the ReCoral project will help the coral ecosystem survive the climate crisis.



↑ Coral spawn collection in Penghu Islands in Taiwan



↑ Researcher carefully removes exceeding algae from corals seeded plate.

During the operational phase more than 30 years after the completion of construction, there is an opportunity for offshore wind farms and surrounding marine ecology to be restored to a state that is even better than before. Read more in our latest Biodiversity Whitepaper.¹⁶

In the Greater Changhua offshore wind farms, Ørsted has already been working on research and initiatives that could further mitigate, restore, or potentially enhance biodiversity on seabed and intertidal habitats and animal such as birds, fish, marine mammal, and other vulnerable species.

The ReCoral project: Exploring potential for coral to thrive in offshore wind farms

ReCoral is a proof-of-concept trial to explore whether offshore wind farms located at subtropical waters may potentially function as a novel habitat for natural coral bands.

At the Greater Changhua 1 and 2a offshore wind farms, we partner with the Penghu Fishery Research Center for the ReCoral project aiming to support natural coral growth on a small selection of wind turbine foundations.

We applied a non-invasive method which involves collecting coral spawn that washes up on the shoreline of the Penghu Islands, cultivating it in the laboratory. We then introduced juvenile corals to an underwater foundation at the Greater Changhua 1 and 2a offshore wind farms, with the intention that they will settle and grow there.

People Stories: Words from Local Communities

Our stakeholders have shared their perspectives on Ørsted and the Greater Changhua 1 and 2a offshore wind farms:



Xie Rongyuan
Former Chairman of Sing Da Marine Structures Co., Ltd. (SDMS)

“Offshore wind power adopts the European standard, which is not the same system as Taiwan was used to. The biggest assistance given to us by Ørsted is the re-establishment and refinement of the European standard system to us by Ørsted is the re-establishment and refinement of the European standard system.”



Chen Polin
CEO of Dong Fang Offshore Co., Ltd.

“Ørsted literally accompanied us at the frontline. They have constantly checked with us about what they can do to make us succeed, which demonstrated that Ørsted is a friend of suppliers”



Tsai Jinfa
Former General Manager of Taiwan Cogeneration Corporation

“These large-scale offshore wind farms are the first in Taiwan. No one in Taiwan has had this experience before. Ørsted has been willing to share their experience from Europe to local manufacturers.”



Wu Jiazhen
Executive Assistant to Chairman of Tai-Shing Engineering and Construction Co., Ltd.)

“Offshore wind turbine foundations are expected to stand in the water for over 25 years. Tai-Shing aims to become a cornerstone of the local supply chain by enhancing welding technology.”



Chen Zongbang
General Manager of Honghua Construction Co., Ltd.

“It has been a learning course for Taiwan to move from near to far shore, and Ørsted really made efforts to enable us to make substantial progress.”



Zhang Yulin
Director of Taichung Fishery Radio Station

“The donation of an electronic nautical chart system by Ørsted has been a significant aid for fishermen.”



Chen Yurui
Trainee of Da-Yeh University Apprenticeship Program, and Wind Farm Technician of Ørsted Taiwan

“I have a keen interest in machinery. Participating in Ørsted’s offshore wind apprenticeship program has provided me with the opportunity to work in my hometown. This allows me to get home after work to take care of my grandparents.”

Conclusion: An anchor project to launch a new industry in Taiwan

Ørsted is committed to supporting Taiwan to establish a world-class offshore wind ecosystem to develop, construct and operate large-scale offshore wind farms.

When we started developing the Greater Changhua offshore wind farms, our ambition was to create a healthy and sustainable local ecosystem for offshore wind.

It is crucial that the first wave of offshore wind projects succeed in Taiwan. The Greater Changhua 1 and 2a project has been delivered under a unique regulatory framework and we take the responsibility seriously to create a strong legacy from an attractive Feed-in-Tariff rate (FiT) and help launch a local supply chain with many first-time suppliers for offshore wind.

Ørsted strives to be a good neighbour to our local communities in Taiwan. We work hard at co-existence with residents, building relationships and offering long-term opportunities to participate in this new sector.



↑ Greater Changhua 1 and 2a offshore wind farms will produce clean energy enough to power one million Taiwanese households every year

To help communities realise the opportunities our projects bring, we have prioritised:

- **Designing for coexistence**

We want to strengthen communities' participation and engagement throughout the design of our projects, so that the build-out not only delivers a positive impact for people but is done in collaboration with people and with a clear understanding of local context.

- **Growing industrial ecosystems**

We're committed to creating local jobs and supply chain opportunities. But beyond this, we want to support the growth of whole industrial ecosystems that can develop local talent, grow local businesses, and promote local innovation.

- **Cultivating talent**

Taiwan had no offshore oil and gas industry, so having people working offshore in the energy sector is a new undertaking. We have provided training programmes, internships, scholarships, apprenticeships and secondments to our projects in the UK, to strengthen capabilities.

- **Acting with integrity**

We take responsibility to assess the impact from any new construction project on the local community and environment. Therefore, we engage in early dialogue with local stakeholders to understand their perspectives on the project and its local impact. We are open and transparent in making our interests and positions clear.

Looking ahead, realising the vast potential of Asia Pacific's transition to green energy requires close and sustained collaboration between industry, governments, and communities.

If we work together to build it in the right way, green energy can help create a more just and prosperous world, generating benefits for nature, society, and the economy.

About Ørsted in Taiwan

Operational projects

Formosa 1

- Ørsted is the biggest shareholder and co-owner of Taiwan's first commercial-scale offshore wind project, Formosa 1, which was extended from a capacity of 8 MW to 128 MW in 2019.

Greater Changhua 1 and 2a

- The Greater Changhua 1 and 2a offshore wind farms are located 35-60 km off the coast of Changhua County and have a capacity of approx. 900 MW to provide clean energy to one million households.
- The 605 MW Greater Changhua 1 is co-owned by Ørsted (50%) as well as Caisse de dépôt et placement du Québec (CDPQ) and Cathay PE, with a combined ownership stake of 50%.

Construction projects

Greater Changhua 2b and 4

- Ørsted was awarded the 920 MW Greater Changhua 2b and 4 offshore wind farms in June 2018. A corporate power purchase agreement was signed with Taiwan Semiconductor Manufacturing Company Limited (TSMC) in July 2020. The Greater Changhua 2b and 4 offshore wind farms are expected to be completed by the end of 2025.

Development projects

- Ørsted is developing a leading portfolio of offshore wind sites and has secured approvals of environmental impact assessments for them that can compete in future tenders in Taiwan.
- The development projects include the Xu Feng and Greater Changhua 3 projects located off the coast of Changhua County, as well as the Wo Neng projects situated off the coast of Taichung.

About Ørsted

The Ørsted vision is a world that runs entirely on green energy. Ørsted develops, constructs, and operates offshore and onshore wind farms, solar farms, energy storage facilities, renewable hydrogen and green fuels facilities, and bioenergy plants. Ørsted is recognised on the CDP Climate Change A List as a global leader on climate action and was the first energy company in the world to have its science-based net-zero emissions target validated by the Science Based Targets initiative (SBTi). Headquartered in Denmark, Ørsted employs approx. 8,900 people. Ørsted's shares are listed on Nasdaq Copenhagen (Orsted). In 2023, the group's revenue was DKK 79.3 billion (EUR 10.6 billion).

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