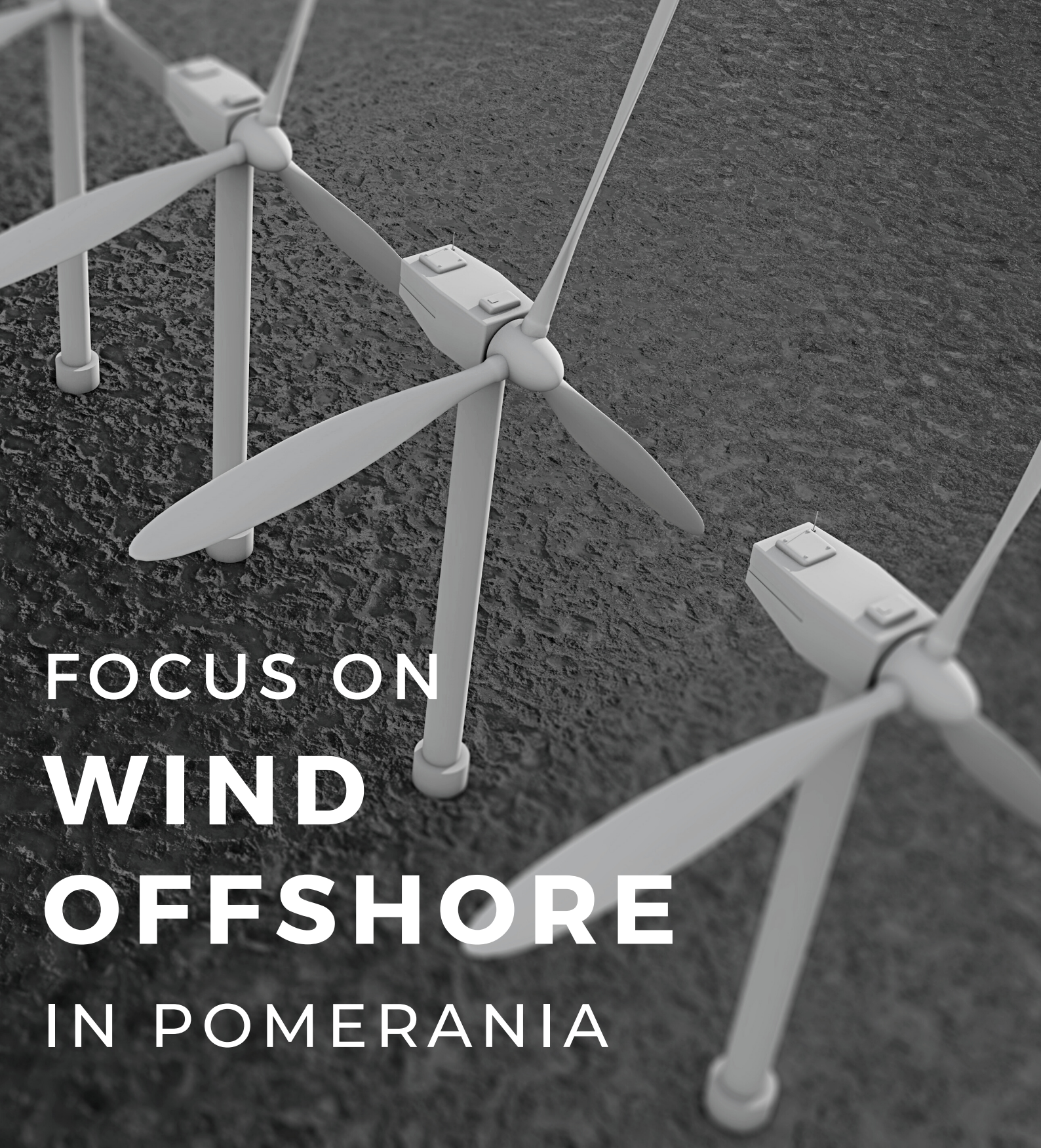




FOCUS ON WIND OFFSHORE IN POMERANIA



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POLAND & POMERANIA



Poland is the biggest economy in Central and Eastern Europe. Since joining the European Union in 2004, the country has witnessed unprecedented economic growth to reach the status of a "Developed Economy" in 2018 (FTSE Russel).

On the other hand, Pomerania is one of the most economically developed regions in Poland. Its coastal location on the Baltic Sea combined with an excellent talent pool has won numerous FDI projects for the region in various industry sectors.

ECONOMIC OUTLOOK POLAND



5.7%

**GDP Growth
in 2021**

54.5

**PMI for Industry,
January 2022**

1st

**Largest economy
in CEE**

The global pandemic did not affect the Polish economy as much as it affected the Euro Zone in 2020. The economy dynamically rebounded in 2021 mainly due to the positive consumer sentiments that boosted the industry. The PMI Index has been standing at much over 50 points for the last year.

ECONOMIC OUTLOOK POMERANIA



Photo: Torus, press kit

8.6%

GPP GROWTH IN 2019

CSO - last available data for the region

7th

fDi's Mid-Sized
European Region of
the Future 2022/23 -
FDI Strategy

1.6 M

Residents in Tricity
Metropolitan Area

2nd

EU region in terms of
job creation; Milken
Institute (2011 - 2016)

ECONOMIC OUTLOOK

Key Infrastructure - Sea Ports



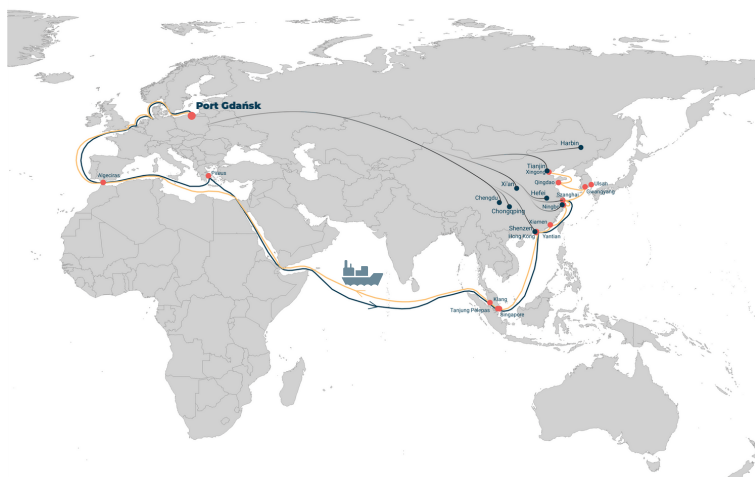
Photo: DCT Gdansk

There are two international sea ports in Gdansk and Gdynia. The ports are tide free and ice free throughout the year and handle all kinds of cargo.

3.1 M

Ports of Gdansk and Gdynia combined are the biggest container hub in the Baltic Sea. in 2021 both ports transshipped over 3.1 million TEUs

DCT Gdansk is the key container terminal that covers almost 70% of the TEUs handled in the Tricity. DCT is the only deep-water terminal in the Baltic Sea Region having direct ocean vessel calls from the Far East. There are 2 connections weekly with Korea and China, which have enabled DCT to become the gateway to CEE and the whole Baltic Sea region.



There are no ports with the capability to handle the largest vessels in the world on the Baltic, east of Gdansk.

ECONOMIC OUTLOOK

Key Infrastructure - Airports



Gdansk Airport is the second largest regional airport in Poland. The daily connections with the key European hubs in Munich, Frankfurt, Copenhagen, Amsterdam and Helsinki, allow for smooth connectivity across the world.

Cargo handling is also becoming an important element of the airport operations. In 2021 over 9 thousand tons were handled mainly on the hub connections (Warsaw, Copenhagen, Frankfurt).



ECONOMIC OUTLOOK

Key Infrastructure

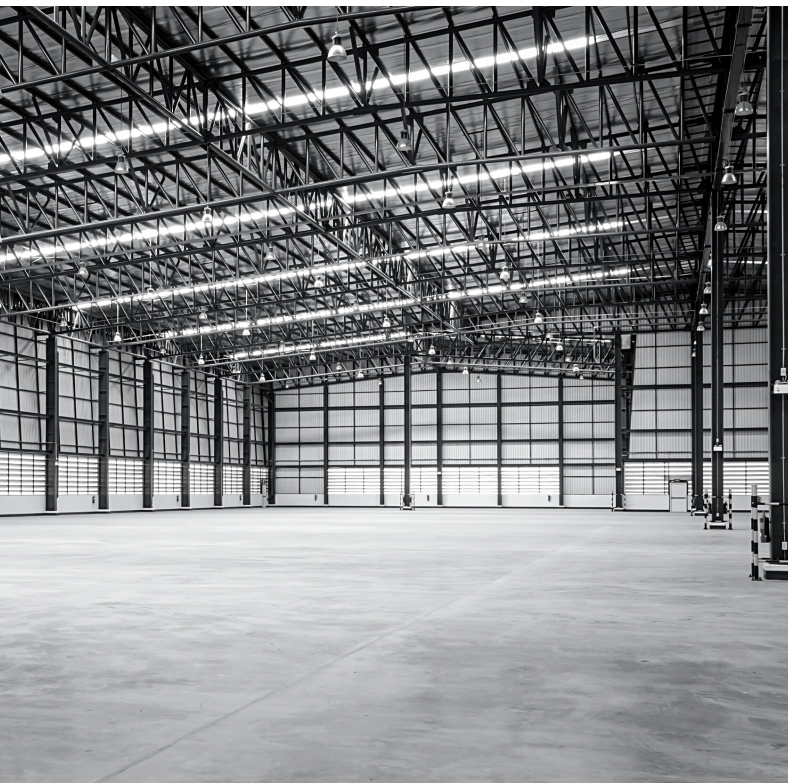
Modern Offices

Stock: 963 000 m²

Rents Rates: 12.5 – 15 EUR/ m²

Vacancy Rate: 9.2%

30% of the demand generated
by IT-related companies (2020)



Warehouse

Stock: 1 031 594 m²

Rents Rates: 2.95 – 3.65 EUR/ m²

Vacancy Rate: 2.19%

Stock planned or under construction:
959 000 m²

ECONOMIC OUTLOOK

Priority Sectors

BUSINESS SERVICES SECTOR

BSS is one of the fastest growing industries in the region. There are over 160 BSS centres that employ over 31 800 specialists. IT centres form 39% of the market. Key investors include Intel, Bayer, Nike, Swarovski, Thyssen Krupp, Allegro, State Street Bank, Maersk Drilling, Ricoh, Fujifilm, Boeing, SII, Hapag-Lloyd.

AUTOMOTIVE

The sector in Pomerania is quite diverse. Pomeranian companies operate within vehicle assembly (Scania, Zoeller Tech), parts manufacturing (Eaton Automotive, Eaton Truck, Federal Mogul-Tenneco, AQ Wiring Systems), electronics manufacturing (Aptiv), e-mobility battery assembly (Northvolt), and firmware development (Intel, Nippon Seiki).

ELECTRONICS

The electronics manufacturing sector in the region is represented by both EMS companies (Flex, Jabil, Lacroix Electronics, Aptiv, Assel, Vector, OribitOne, and Darekon), and OBMs (Radmor, Thales, Carrier, and Sprint). Key customer sectors include Telecom, Automotive, Defence, Security, and Smart Home sectors and other Industry 4.0 sectors. Products include cameras, lightening systems, control panels, telecom devices, circuit boards, data centre infrastructure, and firmware development.

POLISH OFFSHORE

6 GW

Polish Offshore
potential up to
2030

11 GW

Polish Offshore
potential up to
2040

93 GW

Baltic Offshore
potential up to
2050

Current wind offshore projects on the Polish coast will amount to 6 GW by 2030.
The potential for the whole Baltic Sea is estimated at 93 GW by 2050 (balticwind.eu).

CURRENT OFFSHORE PROJECTS

Project	Developer	GCT / GCA	EIA	ED	MW	CfD	COD	O&M Base	Tendering
Bałyk II	Polenergia / Equinor	+ / +	+	+	1200	+	2027	Łeba	Q4 2021 Q2 2023
Bałyk II	Polenergia / Equinor	+ / +	+	+	240	+	2027	Łeba	Q4 2021 Q2 2023
Baltica 3	PGE Baltica	+ / +	+	+	1045	+	2026	Ustka	Q4 2021 Q2 2023
Baltica 2	PGE Baltica	+ / +	+	+	1500	+	2027	Ustka	Q4 2021 Q2 2023
FEW Baltic II	BTI / RWE	+ / +	+	+	350	+	2026	Ustka	Q4 2021 Q2 2023
Baltic Power	Orlen / NPI	+ / +	+	+	1200	+	2026	Łeba	Q4 2021 Q2 2023
BC Wind	Ocean Winds	+ / +	-	-	399	+	2027	-	Q4 2021 Q2 2023

Source: PTMEW

There are seven wind offshore projects under development on the Polish coast. All the projects have received grid connection agreements and contracts for difference. Almost all the developers have also received the environmental decisions. The tendering process has already started. In February 2022 Polenergia announced that Siemens Gamesa will deliver turbines for Bałyk projects.

FOCUS ON WIND OFFSHORE IN POMERANIA 2022



PLANNED OFFSHORE PROJECTS

Project	Developer	GCT / GCA	EIA	ED	MW	CfD	COD	O&M Base	Tendering
Baltyk I	Polenergia / Equinor	+ / +	-	-	1560	-	after 2030	-	-
Baltica 1	PGE Baltica	+ / +	-	-	896	-	after 2030	-	-

Source: PTMEW

There are two other offshore projects that have already received grid connection agreements. A number of other projects are about to be announced soon - new auctions will be announced in 2025 and 2027.

POLISH SHIPBUILDING

Industry Overview



After the bumpy economic transformation in the 1990s, the Polish shipbuilding industry found its niche and became one of the most successful manufacturing sectors in Poland.

37K

There are more than 37 thousand people working in the Polish shipbuilding industry. Pomerania is a leading a region with 17.7 thousand FTEs

Polish shipbuilding exports amounted to **9.1 billion PLN** in 2019. The niche products being delivered include: PSVs, OSVs, LNG powered ferries, ice-class vessels, heavy lift jack-ups, cable layer vessels, offshore installation, mechanical and electrical equipment

SERVICES

- R&D
- Design
- Turn-Key Realisations
- Prefabrication
- Conversions
- Ship repair



LOCAL SUPPLY CHAIN



Although there are no offshore wind farms on the Polish coast yet, for the last few years Pomeranian companies have been successfully bidding for offshore contracts all around Europe.

70K+

McKinsey forecasts that the development of wind offshore might bring more than 70 thousand new jobs to Poland. Although today experts stress that this number might be too far-fetched, all the parties agree that the industry's impact on the Polish economy will be lasting.

The wind offshore local supply chain will be stimulated by both new foreign direct investments and the development of local companies that are already operating in Poland and in Pomerania particularly.

Taking into account the total potential of the Baltic offshore, Pomerania is expecting an influx of new FDI projects, ranging from Tier 1 suppliers to minor cooperators, both in manufacturing and engineering. Polish Offshore Deal obliges developers to show the local content, therefore all the companies bidding for Polish contracts consider starting up operations in the country. Some have already taken decisions - Semco opened their new design&engineering office in Gdynia in 2021.

On the other hand, local companies are also showing high potential in terms of R&D, design, manufacturing of offshore structures and offshore vessels.

RESEARCH & DEVELOPMENT

There are 3 key maritime R&D centres in Pomerania - Maritime Advanced Research Centre, Institute of Fluid-Flow Machinery and CTM. As the latter mainly focuses on maritime defence, the former two have been working extensively on various maritime solutions including wind offshore.

Total R&D expenditures in the Polish maritime industry amounts to 326 million PLN

CSO, 2019

Sample R&D projects

MARE-WINT Research on new material and reliability of Wind Offshore Turbines (OWT). The goal was to provide training in the context of doctoral programmes for 14 researchers in the multi-disciplinary areas of future generation of OWT engineering focusing on issues having a major impact on the mechanical loading of OWT and which are still not sufficiently understood. They have EU financing amounting to 3.8 million EUR.

AQUILO Development of a method for selecting the type of offshore wind turbine support structure in Polish maritime areas.

R&D Infrastructure

Maritime Advanced Research Centre provides its clients with dedicated infrastructure. The Offshore Research Laboratory is designed to conduct hydrodynamic and aerodynamic model tests of offshore facilities, i.e. offshore mining units, including semi-submersible facilities, self-elevating platforms, floating warehouses and processing plants (FPSO), TLP platforms, SPAR platforms, and other hydrotechnical installations.

DESIGN&ENGINEERING

1500 engineers work in ship design centres in Tricity

Polish Maritime Technology Forum estimates

Ship design centres in Tricity employ around 1500 engineers. The scope of design varies from technical documentation to high-end projects, from specialised vessels to offshore constructions. Key companies include StoGda Ship Design&Engineering, Remontowa Marine Design&Consulting, Vartsila Ship Design Poland, Damen Engineering, NED Project, Semco Maritime, and Ulstein. Also key classification societies have their offices in Tricity including DNV, and ABS, Lloyds Register.

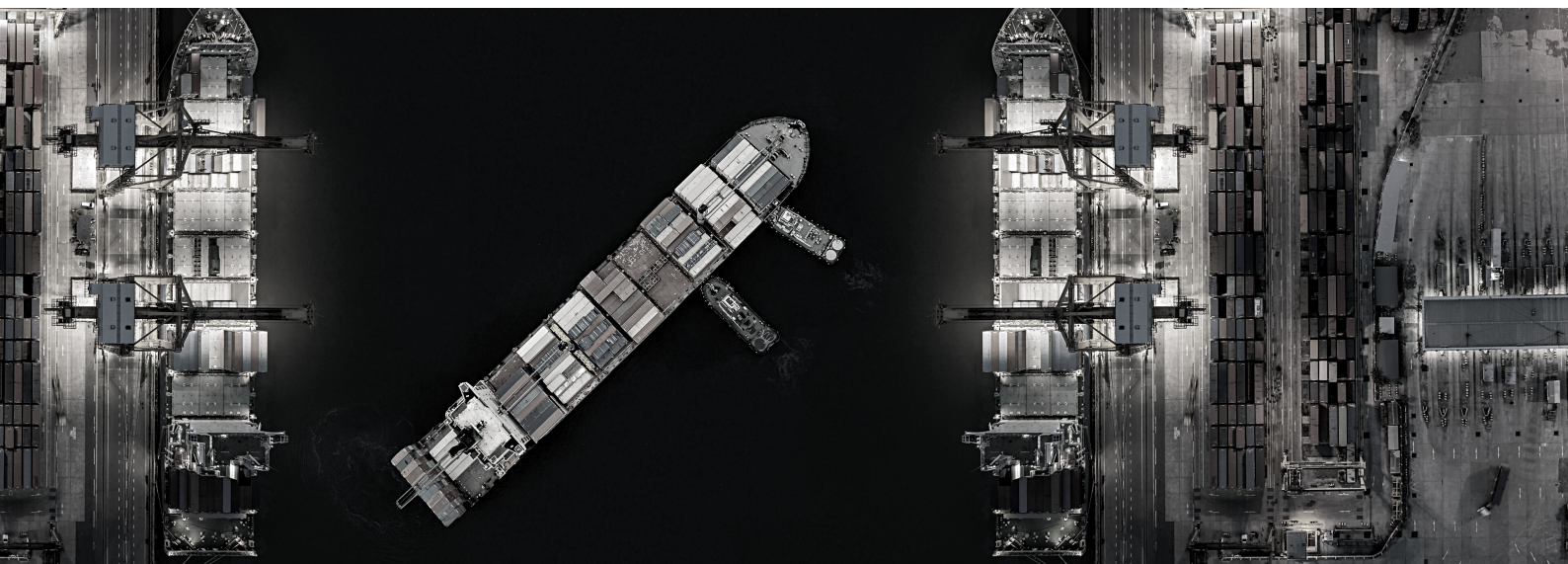
Case Study

HEAVY-LIFT JACK UP "VIDAR"

Two previous jack-up projects: THOR and INNOVATION gave StoGda a huge amount of experience.

VIDAR, was designed by StoGda for CRIST S.A. from the Initial Design stage. StoGda did complete Basic Design including model tests and full range of strength and fatigue calculations as well as design of round legs with spud cans and hydraulic jacking system. StoGda also did Detail Engineering Documentation and as Built Documentation.

www.stogda.pl



SHIPBUILDING

for wind offshore

case studies

"Innovation"

Type: heavy lift jack-up

Length: 147.5 m

Max. water depth: 56 m

Variable load: 8 000 tons

Lifting capacity: 1 500 tons

Built by: Crist S.A

Source: offshorwind.biz



Photo: Hochtief Solutions AG / Crist



Photo: Remontowa Shipbuilding, press material

"Siem Aimery"

Type: cable layer

Length: 95 m

Variable load: 4250 tons

Design working documentation by:
Remontowa Marine Design & Consulting

Built by: Remontowa Shipbuilding

Source: portalmorski.pl

MANUFACTURING

for wind offshore

case studies

Pomeranian shipbuilding related companies have a high potential for developing strong local content for wind offshore

ARKONA OWF

In 2017 EPG delivered 30 platforms for the wind offshore farm Arkona located in the Baltic Sea off Rugen island. Each of the platforms was 9.5m wide and 11.5m long. The total tonnage amounted to 720 tons. Client: Bladt Industries AS.

In 2018 Mostostal Pomorze delivered OWF transformer station for Northwester 2 OWF. The total tonnage amounted to 400 tons. The company has delivered 8 projects of this kind so far.

NORTHWESTER 2 OWF

WIND TOWERS

Gdansk Shipyard - GSG Towers offers a wide range of onshore and offshore wind towers. The company is capable of delivering 38m/8m towers. In February 2022 Industrial Development Agency signed an agreement with GRI Renewable Industries - a new 100 million EUR facility will provide manufacturing capabilities for the biggest 13 MW turbines. The total capacity will amount to 100 towers a year.



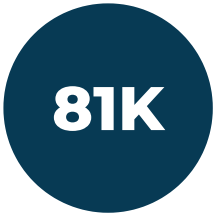
EDUCATION

universities & vocational schools

3500

**students at maritime
related faculties at
Pomeranian universities**

*CSO



81K

Tricity is the biggest academic hub in northern Poland. There are more than 81 thousand students at Pomeranian universities. Among them, over 8000 study at engineering faculties related to maritime technologies, automation, robotics, material engineering, electronics, mechatronics.

Following the development of the Polish wind offshore industry, Tricity universities are launching new wind offshore-related faculties. Gdansk University of Technology offers Master studies "Offshore Technologies". The faculty is run in collaboration with the Technical University of Denmark. The Gdansk University of Technology also offers post-graduate studies in the field of offshore wind energy. On the other hand, the Maritime University of Gdynia has recently launched post-graduate studies "Risk Management in the offshore industries".

Vocational schools provide a talent pool for engineering industries. There are over 5000 students at this kind of faculties.

Both private and public entities are working on different wind offshore-related programmes to provide the new workforce with key competencies. Rumia Invest Park is leading the "Wind Offshore Competence Centre".

SALARIES

manufacturing positions

7.8%

**year on year average
increase in salaries in the
Polish economy in 2022**

*National Bank of Poland estimates

EARNINGS: MANUFACTURING POSITIONS

Assembly worker (with technical knowledge)	3 400 – 3 900 PLN
Assembly worker (no experience)	3 000 – 3 400 PLN
Welder	3 800 – 5 200 PLN
Packer	3 000 – 3 300 PLN
Electrician (qualified)	3 800 – 5 200 PLN
Sprayer	3 800 - 4 800 PLN
Production worker (unqualified)	2 800 – 3 350 PLN
Warehouse worker (with licenses)	3 500 – 3 900 PLN
Machine operator	3 500 – 4 000 PLN

***monthly gross**

Source: Randstad, December 2021

INVEST IN POMERANIA

a decade of FDI attraction

1300

inquires handled

150

closed deals

20000

new jobs

"WE CARE MORE"

Invest in Pomerania is a regional non-profit investment promotion agency that has been winning FDI to Pomerania for the last 11 years. The initiative offers a full scope of support to foreign investors willing to start operations in the region. Invest in Pomerania has been awarded multiple times in different rankings carried out by Financial Times, FDi Intelligence, Milken Institute, Polish Investment and Trade Agency, ABSL.

Invest in Pomerania is also a member of the Pomeranian Wind Offshore Platform - another regional initiative coordinated by the Pomeranian Marshal's Office. The platform aims at bringing all the Polish wind offshore stakeholders together. Currently the Platform comprises of 88 members including the key developers and suppliers.





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