Sector study on the Polish Offshore Wind Energy

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1. Introduction

Offshore wind energy is a crucial part of the ongoing energy transition in Poland, with projects amounting to nearly 6 GW already entering the investment phase and a further 5 GW expected to be launched in the coming years. Capturing the full potential of the sector not only for the production of clean energy but also for increasing the competitiveness of the Polish and European economy requires smart cooperation between experienced offshore energy market players and ambitious newcomers. This is why Dutch companies may play a vital role in making the Polish energy transition a success by contributing to its offshore wind energy sector development. At the same time, there is a potential to establish new partnerships between Dutch and Polish companies to improve their competitiveness in the international market.

The first step towards beneficial cooperation is understanding the specific conditions of the local market and the potential of its supplier base. This is why Dutch Embassy in Warsaw, RVO and NWEA have commissioned Reform Institute, an independent think tank based in Warsaw, to prepare a study on the Polish OWE sector. This document provides an up-to-date overview of the regulatory framework in Poland, ongoing and potential projects and investors active in the market, as well as key Polish companies active within the OWE supply chain.

2. Regulatory framework for OWE in Poland

2.1 Offshore wind energy role in Polish energy policy

The key document outlining the strategic approach of Poland to its energy transition is the Polish Energy Policy 2040¹. It states that the share of renewable energy has to double in Poland in the coming years, with a focus on offshore wind farms, which is indicated by the government and energy companies as a new energy specialisation of Poland, with a target to reach 11 GW in 2040. Industry estimates suggest that this potential may be even higher, reaching 28-45 GW².

The document implementing the assumptions of Polish Energy Policy 2040 is the so-called 'offshore act' of 17 December 2020³. This regulation covers specifically the issues related to offshore wind farm investment. The offshore law being a part of the implementation of the Directive 2018/2001 of the European Parliament and of the Council of 11 December 2018, does complement the system of the Polish renewable sources legislation, which together with the local administrative procedure regulations forms the legal basis for investing in offshore renewable energy sources in Poland.

2.1.1 Support schemes – from administrative decisions to auctions

The support scheme introduced by the offshore law consists of two separate phases. In the first phase of the system, support is granted through an administrative decision issued by the ERO President and may include offshore wind farms with a total installed capacity of up to 5.9 GW. Priority of eligibility for Contracts for Difference (CfDs)⁴ is determined by the order in which complete applications are submitted. Granting the right to support in this phase of the system is subject to individual notification to the European Commission. The investor will be able to commence the execution of the contract for difference concerning the injected energy produced in the offshore wind farm or its part, only after obtaining the appropriate concession, which can be granted by the ERO only if the European Commission confirms the compliance of the public aid granted to the producer for the given offshore project with the internal market.

In subsequent years, support will be provided in the form of competitive auctions awarding CfDs, the first of which are due to take place successively in 2025 and 2027. Those auctions will be coordinated and led by the President of Polish Energy Regulatory Office. If all contracted energy is not sold at the auctions in 2025 and 2027, the ERO President may announce further auctions in 2028 and subsequent years. The auctions will be settled with the pay as you bid

¹ Available at <u>https://www.gov.pl/web/climate/energy-policy-of-poland-until-2040-epp2040</u>

² See <u>PSEW and WindEurope</u> estimates, <u>McKinsey</u> estimates

³ Ustawa z dnia 17 grudnia 2020 r. o promowaniu i wytwarzaniu energii elektrycznej w morskich farmach wiatrowych, available at <u>https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20210000234</u>

⁴ CfD is a long-term contract between the energy producer and the government which provides a stable price ("strike price") for the energy produced. When the market price is lower than the strike price, the government pays the difference to the energy producer. When the market price is higher than the strike price, the energy producer pays back the difference to the government.

principle⁵ and they are expected to add at least 5 GW of installed capacity in offshore wind farms by 2040.

Information on future auctions including anticipated auction timelines is provided in the table below:

Year of auction	Maximum capacity
2025	2.5 GW
2027	2.5 GW
2028	This auction will be conducted only if the total installed capacity of the offshore wind farms resulting from the bids that won the auction in 2027 is lower than the maximum installed electric capacity of offshore wind farms specified for this calendar year

The ERO President is required to announce the auction date no later than 6 months prior to the auction.

2.1.2 Obtaining concessions for erecting the artificial islands

The process of taking part in the ERO-led auctions has also a pre-phase – in order to obtain the right to compete in them, it will be obligatory to first get a concession for erection of artificial islands, on which the prospective wind farms would be located. This will be done through an adjudication procedure, in which the specific applications will be evaluated based on a number of criteria which were introduced through a regulation of Polish Ministry of Infrastructure, established on 1st December 2021.

The said criteria and the points scheme are as follows:

Criteria		Number of points
Compliance	positive opinion or no objections to the application	4 p.
with Maritime Spatial Plan / interference with other	compliance of the investment with the basic or acceptable function and the compliance of the investment with prohibitions and restrictions resulting from the maritime area development plan	4 p.
maritime activities	indication that in the given area the execution of other projects than offshore wind farms will be possible	2 p.

⁵ The bidders will be awarded the CfD based on the strike price from their bid, rather than a market-clearing price.

Timetable the degree of compliance of the dates of commencement and completion of construction and exploitation of the offshore wind farm with the interests of the national economy and the duration of the permit		1-5 p.
Financing	presenting financial security in the form of a bank or insurance guarantee, deposit or surety securing the fee for the permit to erect artificial islands	8 p. – bank guarantee and deposit, 6 p. – insurance guarantee, 4 p. – surety.
	possibility to execute the offshore wind farm with own funds (up to 30%) of the applicant	15 p.
	possibility to execute the offshore wind farm with funds from credits or loans	8 p.
	possibility to execute the offshore wind farm with public funds, including subsidies from the European Union	2 p.
Experience – <u>only in</u>	investment in or exploitation of the offshore or onshore wind farm (min. 20% of capacity of proposed project)	8 p.
EU/EEA	investment in or exploitation of conventional power plant (min. 50% of capacity of proposed project)	8 p.
	investment in or exploitation of grid connection for offshore wind farm	6 p.
Impact on energy transition	positive impact of the planned project on the energy transition and the reduction of greenhouse gas emissions (<u>the higher the</u> <u>applicant's initial emission level</u> , the more points for transition)	7 p.
	qualitative description of contribution to the implementation of specific national sector policies	5 p.
	qualitative description of contribution to the implementation of the EU sectoral policies	3 р.
Other criteria	experience in implementing electric energy storage projects	5 p.
	basin use efficiency of at least 8 MW per km ²	5 p.
	experience in implementing hydrogen projects	5 p.

The score in the 'positive impact on the energy transition' criterion is provided depending on the climate transformation progress indicator of the applicant or the capital group, to which it belongs and it will be assessed by means of a special formula, as it can be seen below:

$$W_{TR} = \frac{E_{OZE}}{E_{total}} \times 100\%,$$

(WTR - the climate transition progress indicator, expressed as a percentage, EOZE - the volume of electricity produced by the applicant or the capital group in the last calendar year as of the date of filing the application from renewable energy sources, within the meaning of Article 2 point 22 of the Polish Act of 20 February 2015 on renewable energy sources , expressed in MWh, Etotal - the volume of electricity produced by the applicant or group in the last calendar year as of the date of filing the application, expressed in MWh)

This calculation method, adopted by the Ministry of Infrastructure, creates a risk of oversupporting the state-controlled energy groups, in whose energy mixes coal plants still have a relatively high share, as the provisions of the new offshore law do clearly state that more points will be given to the applicant which is less technologically advanced and therefore has a lower share of renewable energy in its energy mix. From the business and financial perspective the above mentioned way of promoting the coal-dependent investors, may pose problems to the international investors, that already have a large percentage of green energy in their portfolios.

Further issues raised by the market participants include exclusion of the experience from the UK offshore wind market, as well as the need to qualitatively describe the contributions to national and sectoral policies.

2.1.3 Local content provisions

Another important group of provisions of the new offshore law covers the issue of local content incorporation. There is an explanation given on how the supply chain plan must presented in order to make an investor eligible to apply for the subsidy. According to the Polish provisions, the investor applying for the right to cover the negative balance must provide a plan on the materials and services supply chain.

What must be indicated as a basis of the plan?	The actions that will be taken to secure human resources required for building and usage of the needed infrastructure, as well as the estimated number of jobs, as well as suppliers the project will be needing, contracting approach.
Where can the specific requirements be found?	Specific requirements concerning the content of the plan on the material and services are stated in the offshore act.
What is the scope of the plan?	The plan must be divided into two parts – one concerning the construction stage and the other concerning the operational stage.
What are the further steps after the submission of an application?	The investors supported within the scheme proposed in the offshore law must keep the documentation on the implementation of the supply chain plan and report it to the President of ERO. They also need to present updated plans to the President of ERO within 18 months from the day of submitting the application for support or from the day submitting an offer in an auction, said update should include the outcome of negotiations with prospective local suppliers.

3. Offshore wind farm projects in Poland

3.1.1 First wave of projects

The information on the first wave of the projects which were awarded the CfDs before the introduction of the auction system is summarized below, together with links to websites and local content plans which provide guidance for potential suppliers.

Name	Capacity	Investor	Website	Local content plan
Baltic II	350 MW	Baltic Trade and Invest (RWE Renewables)	<u>Link</u>	<u>Link</u>
Baltica 2	1,498 GW	PGE and Orsted	<u>Link</u>	<u>Link</u>
Baltica 3	1,045 GW	PGE and Orsted		<u>Link</u>
Bałtyk II	720 MW	Polenergia and Equinor	<u>Link</u>	<u>Link</u>
Bałtyk III	720 MW	Polenergia and Equinor	<u>Link</u>	<u>Link</u>
Baltic Power	1,197 GW	PKN ORLEN and Northland Power	<u>Link</u>	Link
BC-Wind	399 MW	Ocean Winds (EDPR and Engie)	<u>Link</u>	Link

3.1.2 Potential future projects

Some major Polish and international actors already presented the prospective locations of the offshore wind farms they would plan to erect.



source: Project of spatial development of Polish maritime areas (2021)

Major companies applying for concessions (Polish companies in bold)	Areas of interest
PKN Orlen	All 11 of available areas
PGE	14.E.1.(together with ENEA),14.E.2.,43.E.1., 44.E.1. (together with ENEA),46.E.1., 60.E.3., 60.E.4. (together with ENEA)
PGE together with Orsted	45.E.1
Energa	2 applications submitted successfully
KGHM together with Total Energies	As for now one application by KGHM (60.E.3), however given the fact that the two have stated a partnership, more applications are being expected
ZE PAK together with Orsted	5 of the available areas
RWE	All 11 of available areas
Shell	All 11 of available areas
Vistra Shelf Companies	9 of the available areas (applications by subsidiaries)
Ocean Winds	9 of the available areas
SSE Renewables and Acciona	60.4.E.
Eolus	2 of the available areas
Equinor (in joint venture with Polenergia)	3 of the available areas
Iberdrola	2 of the available areas
EDF Renewable	All 11 of available areas

Note: based on latest available information

At the same time, since the first announcement of the opportunity to apply for location permits, the Ministry of Infrastructure has issued 12 refusals to initiate proceedings. These investors will be allowed to reapply as competitive applicants. During the recent weeks, some state-controlled Polish energy companies have already started to plan to get more concessions on their own. This trend will probably evolve in the coming months.

Another important matter is the resolution of the situation in which several companies are showing interest in the same areas. According to the newly proposed Draft Modification of the Regulations on Offshore Wind Farm Projects 'in the case when more than one entity is selected in the manner adopted so far, the entity selected in the determination procedure shall be the applicant, who obtains a higher number of points for a given criterion for the application assessment criteria referred to in Art. 27g par. 1 of the Act, from among the entities selected in accordance with the current wording of Art. 27i. Such a solution is aimed at selecting the entity, which will be rated higher in a greater number of criteria than the entity or entities that received an equal number of points in the determination procedure. In the case when also such a solution led to a draw, the entity selected in the determination procedure shall be the applicant, who obtains a higher number of points for the most important application assessment criterion, referred to in Art. 27c par. 2 item 7 of the Act, from among the entities which were selected in the first post-auction round. If the second round of the application assessment did not result in selecting a single entity, the higher value of the planned project indicated in the application will be decisive for the selection.' (text from the justification of the proposed modification)

4. OWE supply chain in Poland

The process of building an offshore wind farm is divided into several stages, each with its own unique challenges and goals. That is why on every stage different contractors are needed. Polish market is not well-developed compared to Western European countries with wind farms located at the North Sea. As a result, not all the necessary equipment for building an offshore wind installation is being supplied by local companies. Quite often Polish firms are subsidiaries of international corporations with experience in this sector. This chapter presents companies active in different fields of expertise related to building and operating an offshore wind farm⁶. Each of the sections presents Polish enterprises as well as subsidiaries of international firms located in Poland.

4.1 Development and project management

4.1.1 Environmental impact assessments and surveys

This section focuses on companies working on environmental aspects of development and consenting services. The key document prepared by these companies is environmental impact assessment required by government to give permission for an investment. In this field local Polish companies control most of the market. There are several global players who offer their services in Poland, but most of the assessments were prepared by Polish enterprises. In most cases they also cooperated with local academic institutions located in Gdynia or Gdańsk. Currently, the company with largest portfolio is Mewo S.A., which has prepared documentation for the different wind farms in Poland and for other projects outside Polish borders. It also has an office in the Netherlands.

 EKO-KONSULT [Baltica-2] link, part of the ASE Group Envia [Baltica-2] link Kancelaria ODJ [Bałtyk II] link Mewo [Baltica-2] [Baltic Power] [BC-WIND] link Tringa [Bałtyk II] link Ambiens link Avesnature link Eko-projekt – Environmental Consultants link EkoMeritum link Ocean Sense link MAG Offshore link Subnea link

⁶ Supply chain elements defined based on<u>https://guidetoanoffshorewindfarm.com/</u>

	DUI Delake (Deltice 21 (DK) link
Local subsidiaries of	
foreign companies	 Ramboll Polska (DK) <u>link</u>
ioreign companies	 ILF Consulting Engineers (AT) <u>link</u>
	AECOM Polska (US) <u>link</u>
	Intertek Poland (UK) <u>link</u>
	HaskoningDHV Polska (NL) <u>link</u>
	 RSK Polska (UK) link

Leading company in the segment, Dutch company

4.1.2 Resource and metocean assessment

Resource and metocean assessment require highly specialised and precise measurement devices. Companies also need to have well equipped vessels for those tests at their disposal. That is why it is not common for local companies to perform such assessments. Main institution capable of carrying out those tests is Institute of Meteorology and Water Management. Thus, it is more common to hire foreign companies or their subsidiaries to perform these analyses.

Local companies	Institute of Meteorology and Water Management (IMGW-PIB) link
Local subsidiaries of foreign companies	 DHI Polska [Baltica-2] (DK) <u>link</u> DNV-GL Poland (NO) <u>link</u> Deutsche Windtechnik (DE) <u>link</u>
	 Vortex Energy Poland (DE) <u>link</u>

Leading company in the segment, Dutch company

4.1.3 Geological and hydrological surveys

Further stage of preparations to the construction process requires geological and hydrological expertise. As it is more common than metocean assessment there are more local companies available on the local market. Especially for the geological surveys, as hydrological analyses usually need some specialised vessels with professional equipment. However, for this part of the analyses also government institutions can be well-fit. Examples are National Geological Institute for geological surveys and Naval Academy in Szczecin for hydrological ones.

Local companies	Lotos Petrobaltic [Baltic II] link
Local companies	GeoFusion [Baltic II] link
	• EkoMeritum <u>link</u>
	 Geofizyka Toruń <u>link</u>
	• Hydrograf <u>link</u>

4.1.4 Engineering and consultancy

The last stage before start of the construction requires preparing the project and finding consultant in that field of the expertise. At the local market there are several companies who specialise in carrying out such a big project like wind power plant. There are also some big global corporations with big experience, who have their agents or subsidiaries in Poland. Due to their vast knowledge, they are frequently chosen by investors for engineering and consultancy services.

Local companies	Mewo [Baltica-2, Baltica-3] <u>link</u>
	 Projmors [Bałtyk II, Bałtyk III] link, part of the ASE
	Group
	Ambiens <u>link</u>
	• Co-Made <u>link</u>
	• Innerbaltic <u>link</u>
	MAG Offshore link
	Lion Environmental <u>link</u>
	• Enmaro <u>link</u>
Local subsidiaries of	• ILF Consulting Engineers [Baltica-2, Baltica-3] (AT) link
foreign companies	 DNV-GL Poland [Baltica-2, Baltica-3] (NO) link
toreign companies	Ramboll Polska (DK) <u>link</u>
	 Intertek Poland (UK) <u>link</u>
	Antea Poland (NL) <u>link</u>
	 Mott MacDonald Polska (UK) <u>link</u>
	Multiconsult Polska (NO) <u>link</u>
	 VSB Energie Odnawialne Polska (DE) link

Leading company in the segment, Dutch company

4.2 Turbine

4.2.1 Nacelle

The second table contains information on the biggest companies offering parts of nacelle. As it is a complicated construction several different components are required, production of which requires many years of experience and highly developed production technology. Since it is a very specialised sector there are only a few key global players offering their products all around the globe. However, it is worth noting that major international corporations have their subsidiaries in Poland, which creates an opportunity to work with them on those projects.

Local subsidiaries of foreign companies • Hita • KK • Sier • ABE • NTN • EKS • Nex • SKF • Sch	Poland (US) <u>link</u> achi Energy Polska (JP/CH) <u>link</u> Wind Solutions Polska (DK) <u>link</u> mens Poland (DE) <u>link</u> & Poland (CH) <u>link</u> N-SNR Polska (JP) <u>link</u> A – Prysmian Group (IT) <u>link</u> cans Power Accessories Poland (FR) <u>link</u> Polska (SE) <u>link</u> neider Electric Polska (FR) <u>link</u>
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Leading company in the segment, Dutch company

4.2.2 Rotor

Market for another crucial part, the rotor, is quite similar to that of the nacelle. It also requires precise machinery to produce and most of the companies have years of experience in that field. Moreover, high quality rotors need to be produced with best available materials, which production is only possible after high spending on research and development. That is why rotors are also most frequently supplied by global corporations with subsidiaries in Poland.

Local subsidiaries of	• GE Poland (US) <u>link</u>
foreign companies	Siemens Poland (DE) <u>link</u>
	• SKF Polska (SE) <u>link</u>
	• 3M Poland (US) <u>link</u>
	 SKF Polska (SE) <u>link</u> 3M Poland (US) <u>link</u>

Leading company in the segment, Dutch company

4.2.3 Tower

The last major element of the construction is the tower. It does not require so many highly precise electronic equipment and bases mainly on good quality steel, internal equipment and special paints to prevent corrosion. That is why many parts of the tower can be supplied by local companies. Such parts include steel, paints and access and safety equipment for the personnel. The production of towers themselves is planned to expand based on both FDIs and existing capacities of Polish industrial group Grupa Przemysłowa Baltic.

Local companies	• GP Baltic (GSG Towers) <u>link</u>
Local subsidiaries of foreign companies	 Windar Renovables (ES) <u>link</u> GRI Renewable Industries (ES) with GP Baltic <u>link</u> Huta Częstochowa – LIBERTY Steel Group (UK) <u>link</u>

4.3 Balance of plant

4.3.1 Cables

This section contains companies manufacturing cables and associated suppliers necessary to transport the energy from a wind farm to the mainland. The market is dominated by a few biggest players, among those companies there is a Polish corporation TFKable. It is a renowned firm supplying cables all around the world, with subsidiary in the UK.

Local companies	• TFKable link
	 JDR Cables (UK subsidiary of TFKable)
	• Altum <u>link</u>
Local subsidiaries of foreign companies	• NKT <u>link</u>
	Nexans Power Accessories Poland (FR) link
	 EKSA – Prysmian Group (IT) <u>link</u>
	Helukabel Poland (DE) <u>link</u>

Leading company in the segment, Dutch company

4.3.2 Turbine foundation

Next part of the investment is foundation for the turbine. This stage of the construction requires monopiles, cranes, cement and corrosion protection. Monopiles are only supplied by either foreign companies or local subsidiaries of global firms. It is due to the fact, that the only local producer, ST3 Offshore went bankrupt, due to lack of orders and is currently waiting for a new investor. Cranes and cement can be supplied by the local companies. Special paints to prevent corrosion are produced both by Polish enterprises and members of international groups who operate in Poland.

Local companies	 ST3 Offshore (in bankruptcy) link Mostostal Pomorze link Gafako link Mostostal Siedlce link
Local subsidiaries of foreign companies	 Boskalis Polska (NL) link Bladt Industries Polska (DK) link Spomasz Smulders (FR) link Ramboll Polska (DK) link

4.3.3 Offshore and Onshore Substations

Further stages of investment are offshore and onshore substations. They generally ten to have the same suppliers as they are quite similar. Polish companies are mainly active in the fields of cranes needed for the construction, HVAC systems, joining cables to the network and aluminium. For the projecting and constructing the substations usually either foreign companies or subsidiaries of international groups need to be hired as they possess necessary experience.

Local companies	 Energoprojekt-Katowice [Baltica-2, Baltica-3, onshore] link Enprom [Baltic Power, onshore and offshore] link PILE Elbud [Baltic II] link GP Baltic (Energomontaż-Północ Gdynia) link Alumare link Aluship_link Elfeko link SPIE Elbud Gdańsk link Cermar Industry_link Fabryka Transformatorów w Żychlinie link Olmex_link Onde link Stal Complex_link
Local subsidiaries of foreign companies	 Bladt Industries Polska (DK) link GE Poland (US) link Hitachi Energy Polska (JP/CH) link Muehlhan Polska (DE) link Schneider Electric Polska (FR) link Semco Maritime (NO) link Spomasz Smulders (FR) link ABB Poland (CH) link Multiconsult Polska (NO) link Heerema Fabrication Group Polska (NL) link

4.4 Installation and Commissioning

4.4.1 Installation and commissioning services

Subsequent step of the process is installation and commissioning of the wind power plant. Even globally there are not that many companies who have experience in that field, let alone Polish market. It is because it requires highly specialised crews and vessels. That is why most available options are among foreign corporations. Other alternative are companies who have their subsidiaries in Poland, but there are less of them, as Polish region of the Baltic Sea was not as often used for wind installations as other sea regions in the area.

Local companies	 El-Mark link Mostostal Pomorze link Zamet Industry link Gafako link Morska Agencja Gdynia link Mostostal Siedlce link
Local subsidiaries of foreign companies	 Boskalis Polska (NL) link Mostostal Warszawa – Acciona Group (ES) link Global Wind Service Poland (DK) link

Leading company in the segment, Dutch company

4.4.2 Installation port

According to the latest arrangements the installation port will be located in **Gdańsk**. This is a significant change due to the fact that Gdynia, which is a neighboring city to Gdańsk, was previously indicated for this post.

The transfer of the planned installation port from Gdynia to Gdańsk may impose some impact on the exact timing of offshore projects realisation. There are still concerns about whether the installation port for wind farms from the first phase of support will be built on time. At issue are 7 projects with a capacity of 5.9 GW, which are expected to deliver electricity before 2030. Nonetheless, the Polish government has recently adopted an act changing the previous installation port law. At this moment, according to the Ministry of State Assets, the external port in Gdańsk is to be built by June 1, 2025. This investment will meet all the criteria of industry investors and will allow the first phase of development of the offshore wind energy sector to be completed on time. They argue that the Gdańsk port has for the time being a more suitable infrastructure, allowing to build the necessary external port quicker than in Gdynia and thus be able to keep up with the schedule.

4.5 Operation phase

4.5.1 Operation, maintenance and service

Next stage, after carrying out all previously mentioned steps, is operation, maintenance and service. It requires to find the companies responsible for the management of the wind farm and who can train crew for specialised maintenance. In the latter field there are available companies on the Polish market. There is also a significant local supplier base for products and services related to vessel design, construction (most notably CRIST Shipyard) and maintenance, as well as providers of necessary specialised services (including education for offshore sector workers).

Local companies	 CRIST Shipyard link Remontowa Shipyard link StoGda Ship Design and Engineering link Morska Agencja Gdynia link Morska Agencja Gdynia link Altum link Baltic Diving Solutions link Bota Technik link Famur link European Wind Academy link GO ROPES link Polskie Linie Oceaniczne_link ROJAM link SAFE Engineering Services link Vistal_link Vulcan Training and Consultancy link windhunter academy link
Local subsidiaries of foreign companies	 Deutsche Windtechnik (DE) <u>link</u> DNV-GL Poland (NO) <u>link</u> Global Wind Service Poland (DK) <u>link</u> WPD Windmanager (DE) <u>link</u>

4.5.2 Service ports

Additional part of the necessary onshore infrastructure is Operation Base. It most often includes warehouses, workshops and vessel berths. Up to date, three Polish ports have been chosen to service the first wave of projects.

Port in **Łeba**:

- Baltic Power,
- Bałtyk II and III.

Port in **Ustka**:

- Baltic II,
- Baltica 2 and 3.

Port in Władysławowo:

• BC-Wind.

4.6 Academic institutions

Several Polish academic institutions are involved in preparation of Environmental Impact Assessments, education and research activities connected to the first wave of the projects:

- Technical University of Gdańsk (link)
- University of Gdańsk (link),
- Polish Geological Institute (<u>link</u>),
- Institute of Oceanology of Polish Academy of Sciences (link),
- Maritime Institute in Gdańsk (link),
- Gdynia Maritime University (link)
- National Marine Fisheries Research Institute (link).

4.7 Sectoral associations

Several sectoral associations are active in the areas relevant for offshore wind energy development in Poland:

- Polish Wind Energy Association (link),
- Polish Offshore Wind Energy Society (link),
- Polish Chamber of Maritime Commerce (link),
- Polish Maritime Technology Forum (link).