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Hellenic Wind Energy Association

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Status and Challenges for the supply chain
for Offshore Wind in Greece

Part II – Acceleration of the Development of the first floating offshore projects

April 2024

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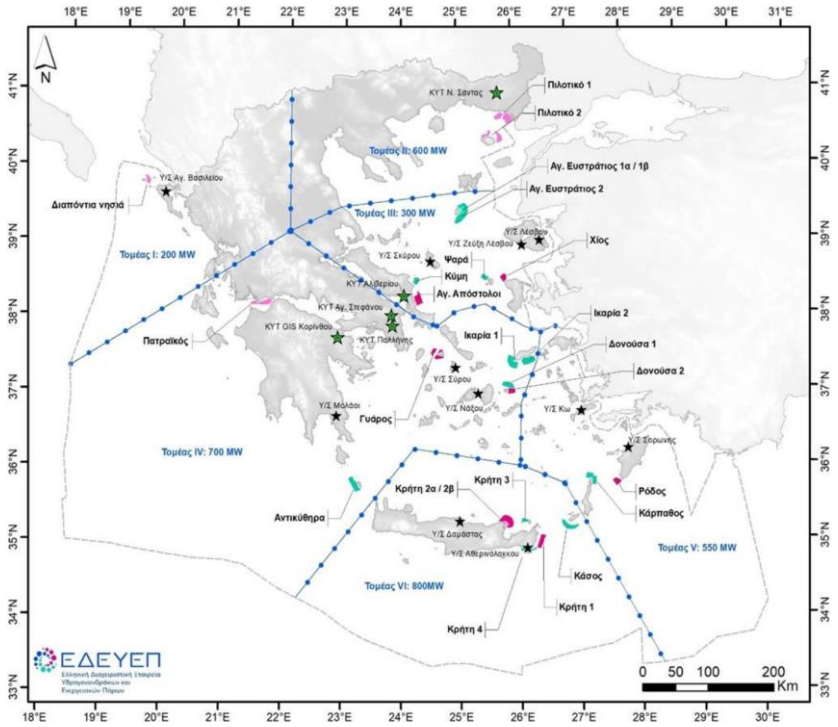
Background

According to the country's preliminary energy planning, the target for Offshore Wind Farms (OWF) is **1,900 MW for 2030** and **6,200 MW for 2035**. The **target for 2050 is 17,300 MW.**

The deployment of offshore wind can boost the gross domestic product by up to **€ 1.9 billion per year** on average over the period 2024-2050.
Over the same period, it can make a significant contribution to employment, supporting up to **44,400 jobs per year**.

Achieving these goals requires significant investments: over **€6 billion by 2030** and over **€ 28 billion by 2050**. These investments may have a **high local added value** (even up to 67%).

The effective implementation of the announced National Program for OWF **is an opportunity for the state and the society**.



* *In order to speed up the OWF roadmap, it has been announced that 2 floating offshore wind farms would be licensed and tendered by the end of 2025, so that they can be completed before 2030.*

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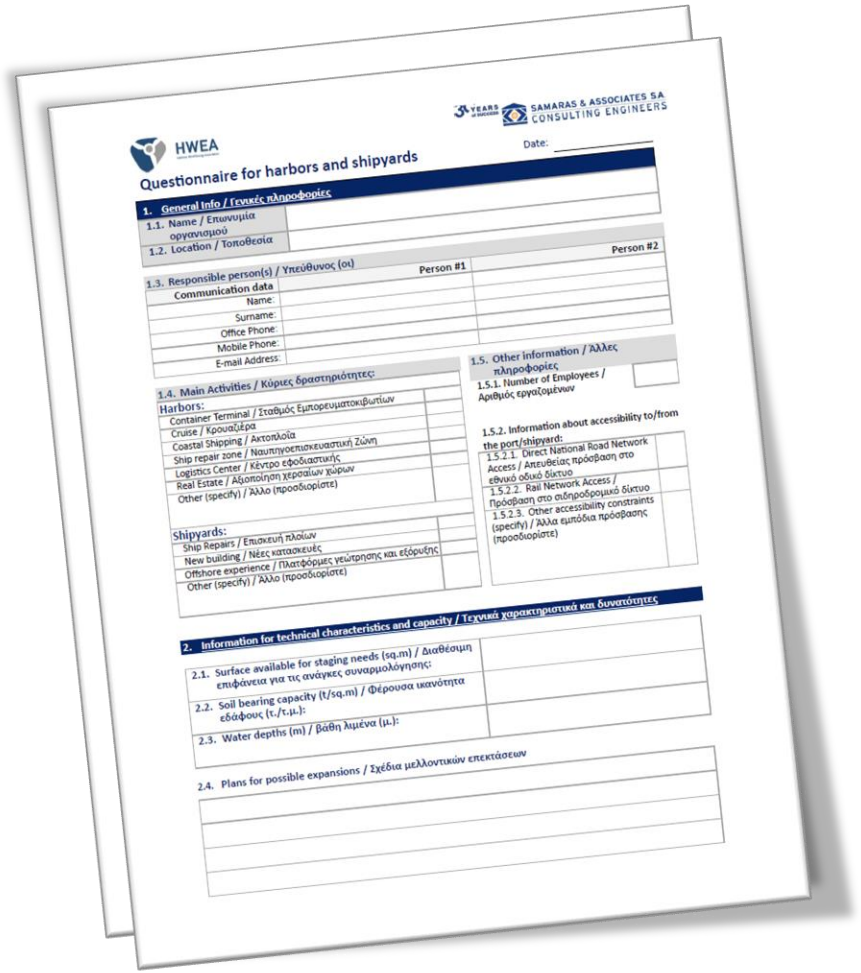
Project Framework

Scope of initial survey (part I) :

- Identify the possible parts of the OW supply chain
- Propose what is necessary to be done to establish this supply chain effectively.

Scope of extension (part II) :

- Survey more fields of the supply chain, such as Offshore services, Crane services and cables.
- Impact of the declared acceleration of the development of the national OWF program.



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Ports

- PIRAEUS
- THESSALONIKI
- VOLOS
- ALEXANDROUPOLIS
- ELEFSINA
- IRAKLEION
- KAVALA (FILIPPOS B')
- LAVRION
- EVIA (KYMI)

Shipyards

- ELEFSIS
- SYROS
- CHALKIS
- SALAMINA

Steel & Cables Industry

- Corinth Pipeworks S.A.
- Hellenic Cables S.A.
- Lykomitros Steel S.A.
- SIDMA Steel S.A.
- Elastron S.A.
- EMEK- Group

Cement Industry

- Heracles General Cement Co. S.A. (Lafarge)
- Titan Cement Company S.A.

Maritime Services & Cranes

- NemecaZ
- MegaTugs
- Asso.subsea
- Anipsotiki S.A.
- Giannakos Cranes

Key players / Survey participants

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Survey focus

I. Outlook on the Offshore Wind Farm Sector

- ✓ Awareness of the sector
- ✓ Opinion of the company's management on the offshore wind farm sector
- ✓ Views on public policies
- ✓ Willingness to involve
- ✓ Key factors for involvement
- ✓ Readiness of the company
- ✓ Strengths & Weaknesses

II. Outlook on the acceleration in the development of floating OWF

- ✓ Views on the acceleration
- ✓ Positive and negative implications of the acceleration
- ✓ Effect on business planning
- ✓ Readiness to provide services immediately
- ✓ Easiness to meet the needs of the first floating offshore wind farms
- ✓ Implications if the implementation of the first projects was actually delayed

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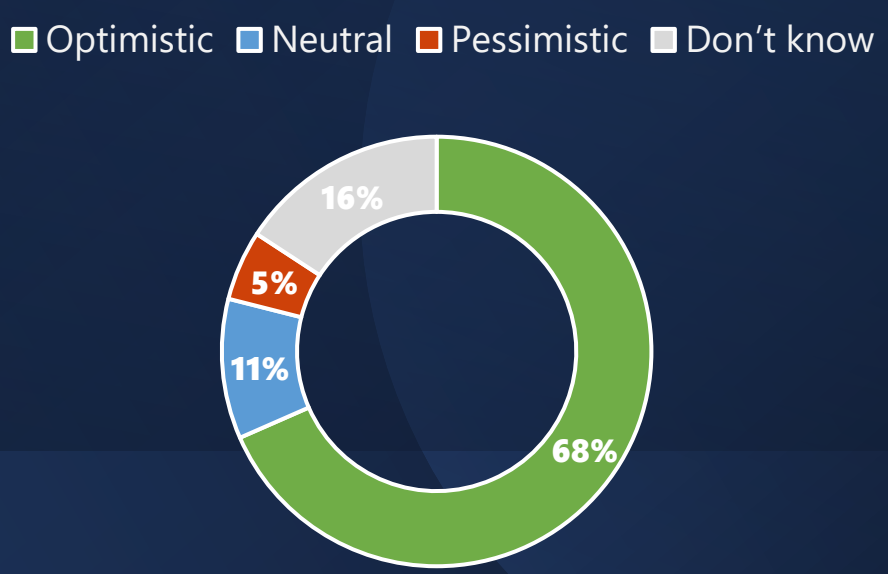
Positive attitude but also low knowledge on the prospects of the offshore wind farm sector.

Outlook of the offshore wind farm sector



7 out of 10
are positive about the industry's prospects

Positive opinion

about government policy regarding the development of the offshore wind farm sector

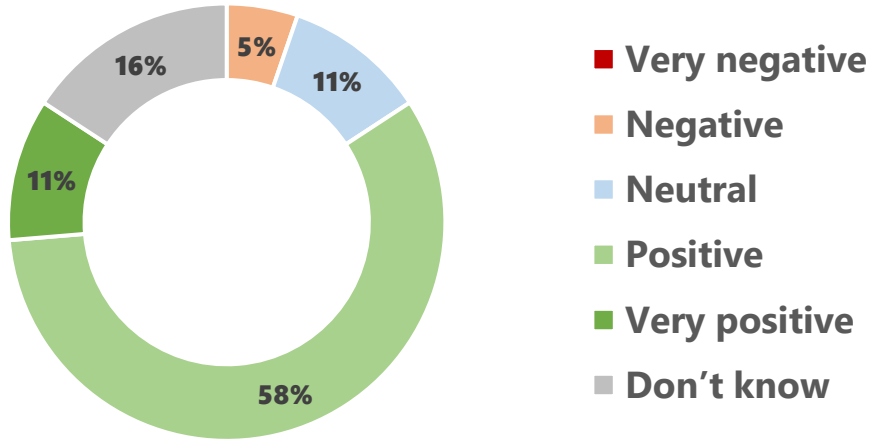
Main positive points:

- Strong commitment to carbon neutrality/ transition toward renewable energy
- Orientation for investments in energy projects
- National Program for OWF announcement

Main points of concern:

- Risk of delays: OFW Roadmap must stay on schedule otherwise the opportunity may be lost
- Licensing process: Ensuring that projects will not face bureaucracy obstacles and delays
- Uncertainty about state consistency until legislation is issued

*Views on current **public policies** for the development of the offshore wind farm sector*

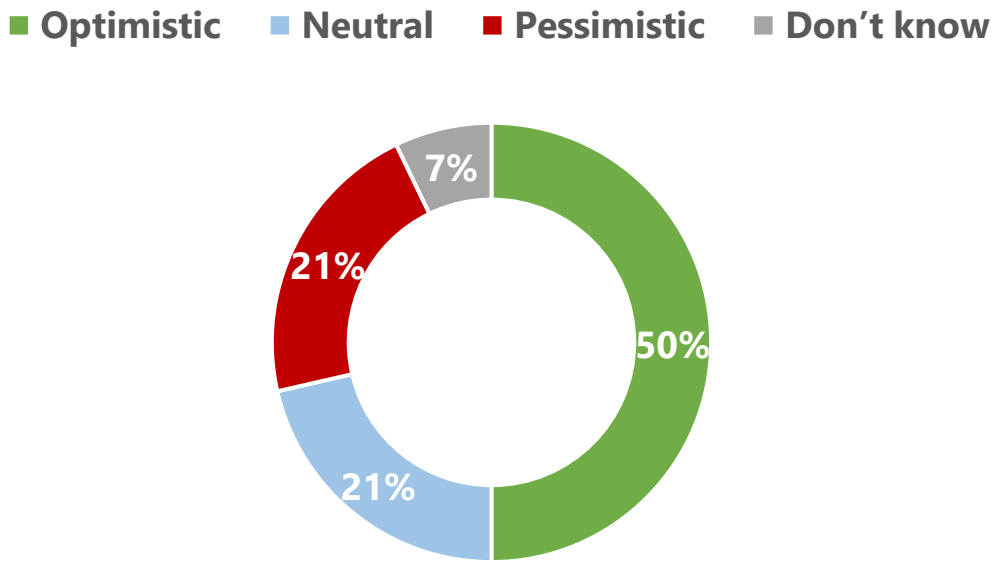


Balanced expectations on state incentives

Main points:

- State funding is a prerequisite for investments in ports.
- EU funding needs to be exploited.
- High locally added value should be assured.
- Compensation to local communities must be examined to reduce reactions (NIMBY effect).

Expectations on state incentives *by the Government for the development of the offshore wind farm sector*



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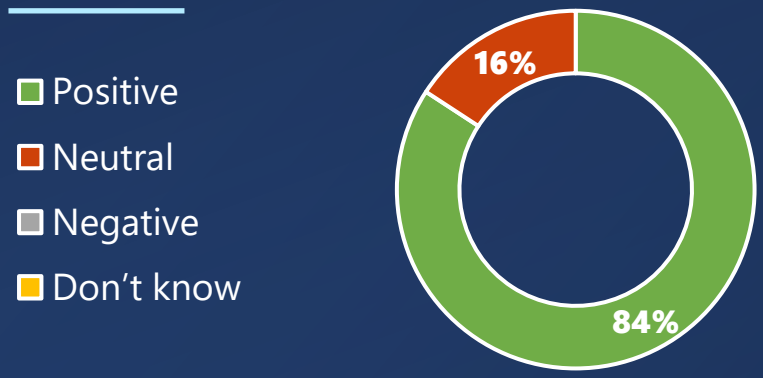
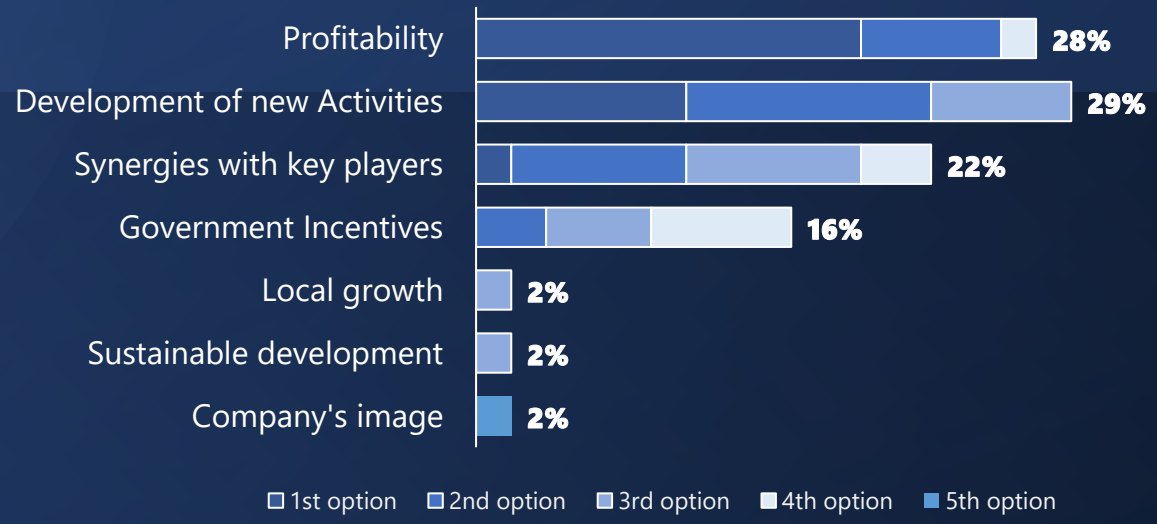
Absolutely positive attitude about involvement with the offshore wind farm sector

Willingness to involve with the OWF



Development of new & innovative activities and profitability are the most important factors for involvement with the offshore wind farm sector

Key factors for involvement with the OWF sector

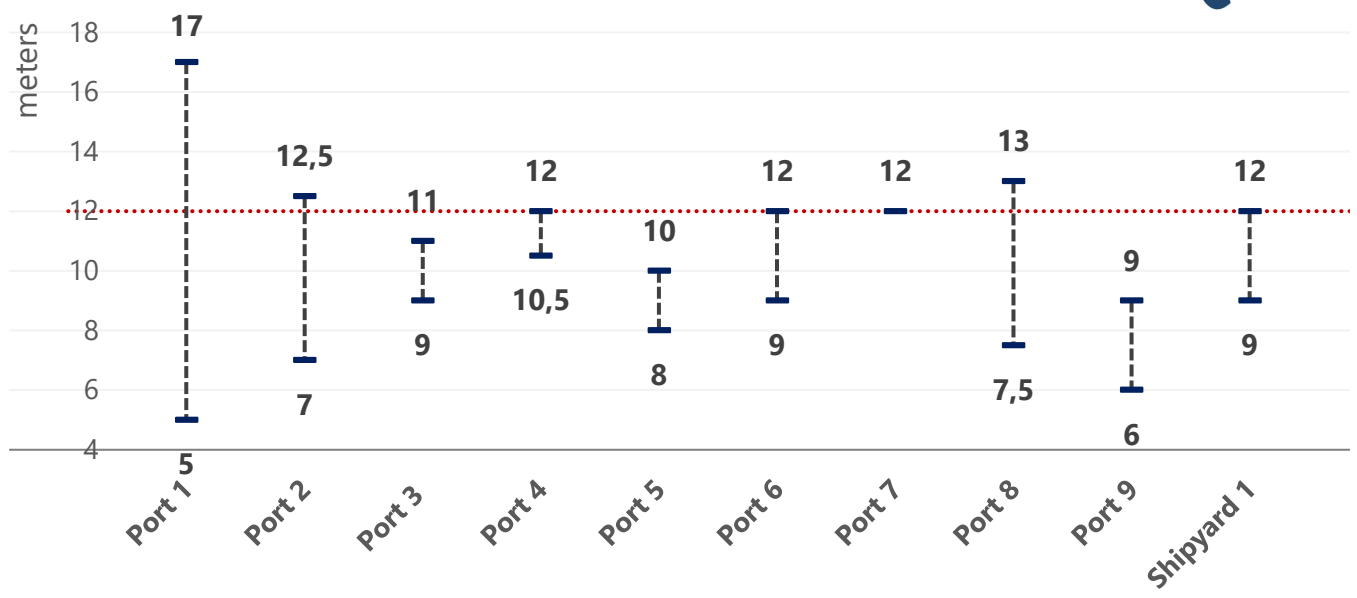


Inadequate port infrastructure
is the most significant challenge to support the projected growth in offshore wind

Main challenges:

- Limited space.
- Low water depths.
- Weight restrictions (soil geotechnical evaluation need to be done).
- Insufficient equipment.

Water depths



Surface available for staging needs

** Available surfaces may vary depending on other existing port activities*

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Low level of readiness and several challenges
for ports

- Orientation of management to other activities – competition to existing activities, mainly due to limited space
- Management uncertainty due to port privatization plans
- Lack of funds for infrastructure investments
- Master plans define Land use – Will need to be updated
- Licensing issues

Higher level of readiness and waiting attitude
for shipyards & industry

- Constant upscaling of design restricts production planning
- Industrialization is a key factor to cost reduction
- Limited available space in ports
- Uncertainty due to lack of confidence that the state tenders will take place on schedule
- Capital expenditures required
- Uncertainty due to unknown tariffs

High level of readiness but also investment needs
for maritime and crane services

- Investment needs in new equipment
- Need for long term commitment to invest that will may be used exclusively to such project
- Uncertainty about equipment specifications required until design specifications are finalized
- Staff shortages

Main challenges

Readiness of the company, in view of its commercial strategy, to involve with the offshore wind farm sector (score 1-10)

Status and Challenges for the supply chain
Summary

STRENGTHS

- Significant wind potential.
- Strategic location.
- Maritime heritage.
- Industry and shipyards know-how.
- Skilled workforce.
- Experience by the management of onshore wind farms.
- Political will.

WEAKNESSES

- Insufficient infrastructure in port space and equipment.
- Lack of assembly know-how in ports.
- Regulatory constraints.
- Uncertainty due to port privatization plans.

OPPORTUNITIES

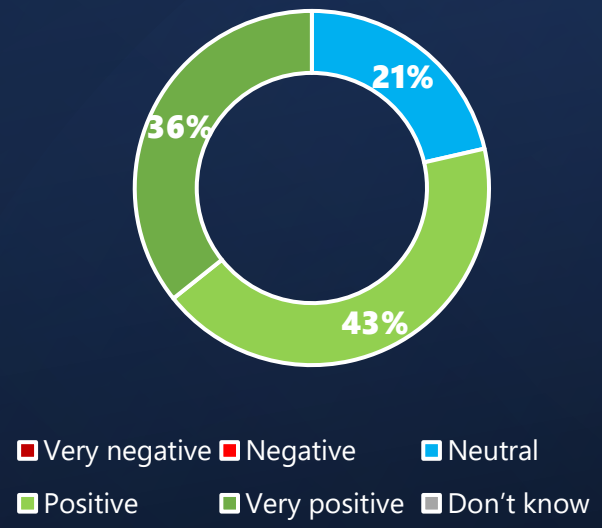
- A new innovative technology that may be developed in Greece.
- Novel industrial sector with prospects of at least 30 years of activity.
- Potential high local added value for Greece.
- Side – activities development: a new industry in offshore wind maintenance.

THREATS

- Risk of delays.
- Lack of a clear legal framework.
- Bureaucracy.
- Limited or lack of social acceptance.
- Increasing costs.
- Investments required in infrastructure
- Constant design upscaling.
- Limited capacity Europewide.
- Staff shortages

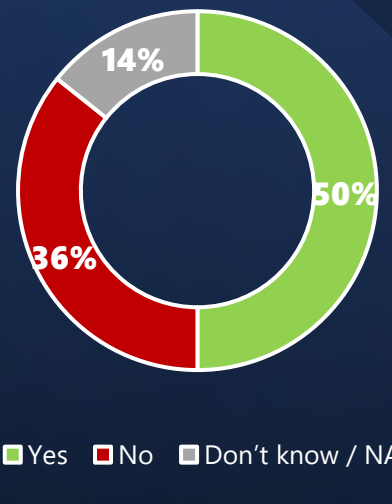
Intended acceleration of development *of floating OFW...*

Views on the intention to accelerate the development of floating OFW



... key driver for decision making

Business planning impact of possible acceleration of floating OWF development



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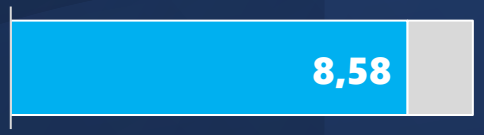
Medium to high readiness level
for direct involvement in OWF Projects

Ports

- Depending on the specific project requirements in land area, vessels, etc. and on port availability at that time
- However, ports seem to face the OWF activity as just another port related activity, without taking into account the possibility of participating in the staging procedure

Shipyards & industry



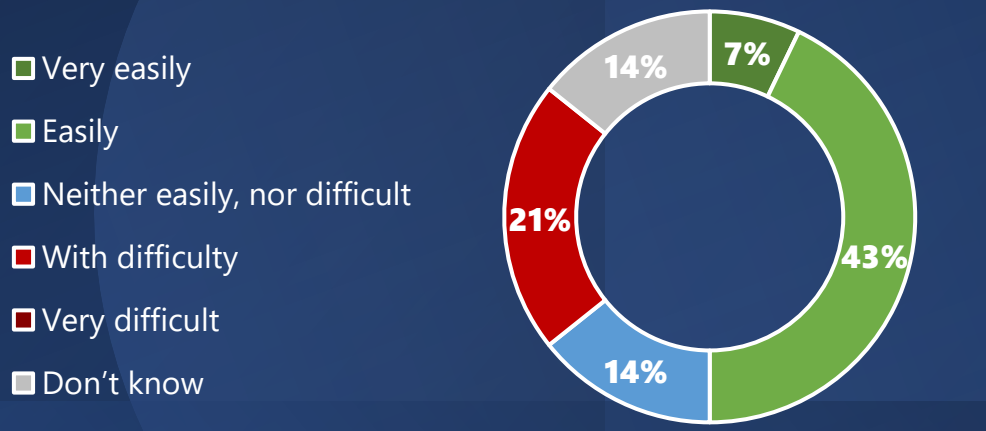
- Some of the companies have already produced parts for OWF or are currently in discussions with developers, or with other companies in Greece.
- Preliminary work has been performed and are expecting for the relative business decision to participate

Maritime services & Cranes

- Extensive experience from their participation in On Shore Wind farm projects for crane companies.
- Required investments in new equipment will need time, given that the specifications are not finalized yet.
- Absolute readiness but lack of the availability for maritime service companies that are already participating in OWF projects in other countries

If, in theory, the tender for the first projects were completed today and the investor to undertake their construction was announced, how ready are you to offer your own work/services? (score 1-10)

Relatively ready for the first floating OFW …under conditions



Conditions

- Design maturity.
- Define exact specifications of projects (required infrastructures and equipment).
- Long term prospect (so that the investment is worthwhile).
- Local supply chain support (to avoid unfair competition).
- Investment cost.
- Risk sharing (between supply chain and developers).

No direct commitments for supply chain *(as they will not invest unless the growth of the industry is ensured).*

How easy would it be to immediately meet the needs to build the first floating offshore wind farms? What would be the conditions?

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Acceleration in the development of floating OWF

Pros

- ✓ Faster growth of the industry, new industrial activity, a good business opportunity coming closer.
- ✓ State commitment to the development of the Sector, increase of confidence.
- ✓ Opportunity to identify procedural / legislative / supply chain issues.
- ✓ Know-how for future projects.
- ✓ Competitiveness enhancement.

Cons

- o Fear of shoddiness that could lead to investor discouragement
- o Lack of preparation time, for the supply chain
- o Unforeseen costs if the supply chain is not ready.
- o Greater involvement of foreign companies.
- o Lack of social acceptance.

Delayed implementation of the OWF program

Pros

- ✓ Maturing technologies so potentially lower costs.
- ✓ More time for supply chain readiness.
- ✓ Possible further development of onshore wind farms.
- ✓ It will clarify the landscape in cases where the immediate future is undefined. (e.g. ports to be privatized)

Cons

- o Developers will leave for other markets, confidence in the country will be lost.
- o Opportunity to develop know-how will be lost - the existing domestic supply chain of wind energy will be lost over time
- o Opportunity for new economic activity for domestic supply chain will be lost
- o Supply chain resources may be allocated to competing activities.

Positives & negatives from the acceleration/delay in the development of floating offshore wind farms

Thank you

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