

Marine Investment in the Blue Economy

Socio-economic assessment of combinations

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Project context

- ◆ A WP4 deliverable
- ◆ Combinations not actual projects so pre-company involvement

Socio economic context

- ◆ Trade-off between IRR, and jobs and gross value added (GVA)
- ◆ Best IRR project likely to have least jobs (depending on proportion of spend that goes on labour)
- ◆ Forecast jobs and GVA might be great for a specific project but if project is too expensive it will not happen so zero socioeconomic benefit
- ◆ Too early stage to predict jobs and GVA – we would do this as part of Environmental Impact Assessments as part of consenting
- ◆ At this early stage need some indicators to consider

Basins considered

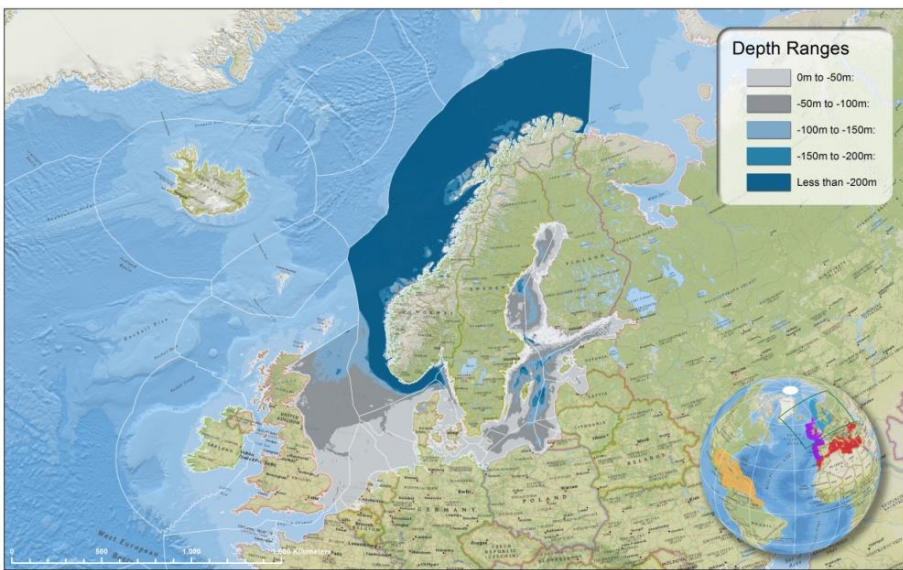
Atlantic Region



Mediterranean Region



Baltic Region

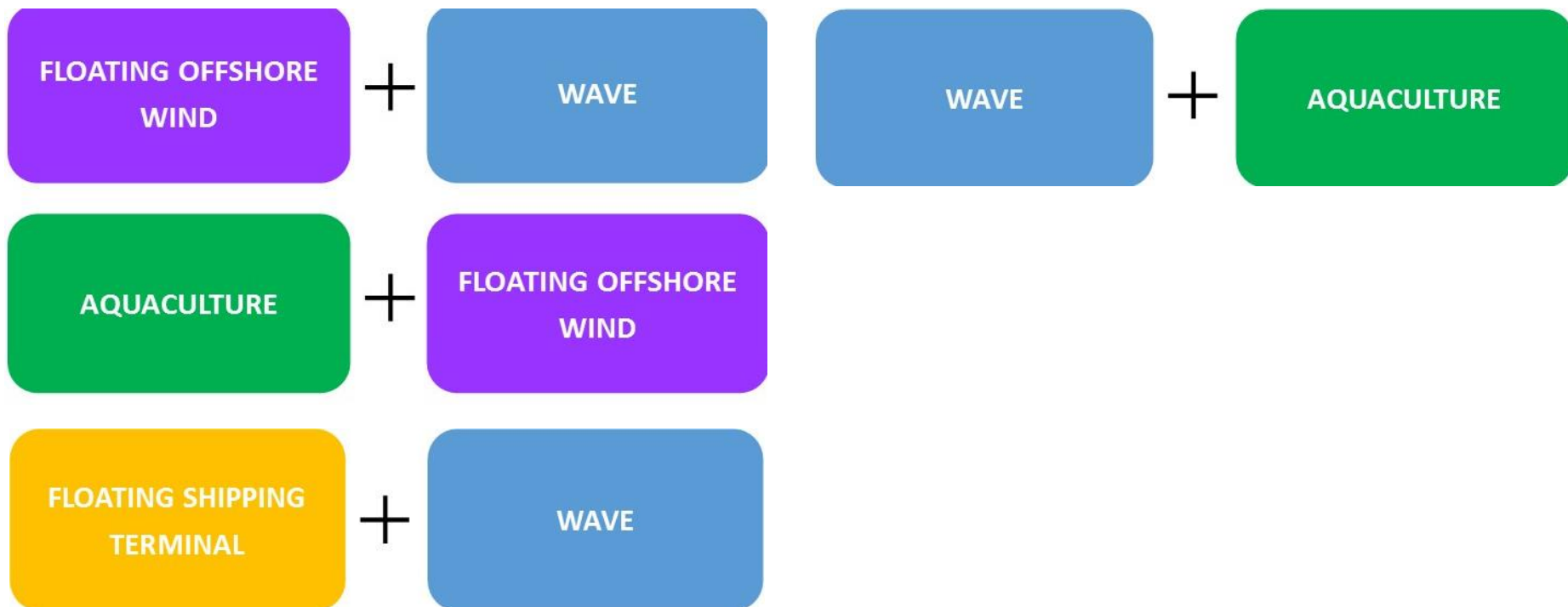


Caribbean Region



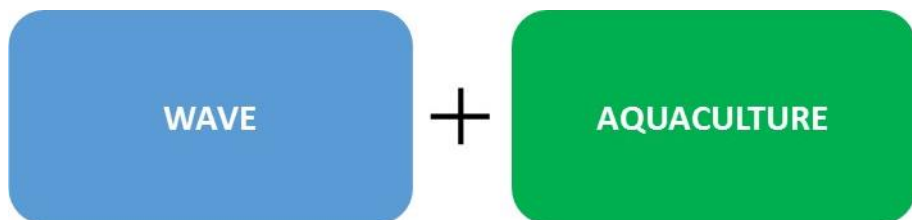
7 potential combination types

🟢 Atlantic:

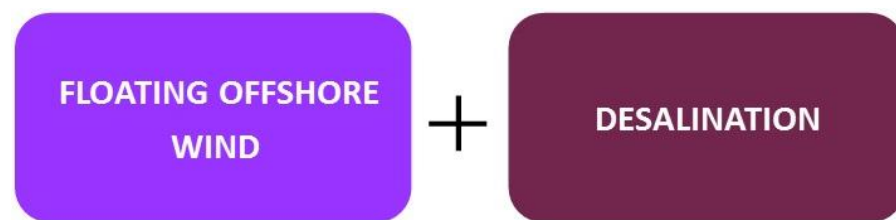


7 potential combination types

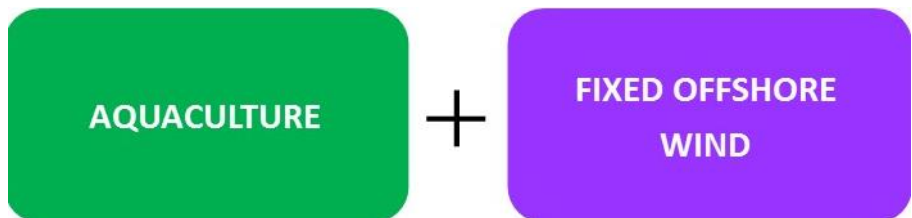
🟢 Mediterranean and Black Sea:



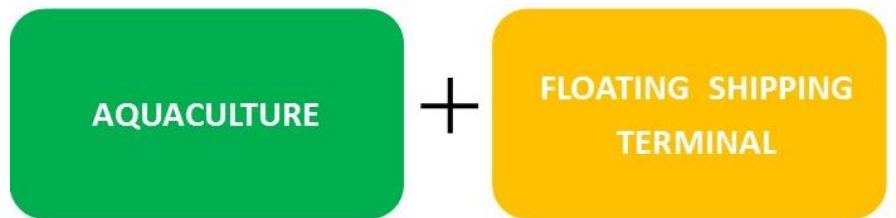
2nd time



🟢 Baltic and North Sea: Caribbean






🟢 Caribbean – French Guiana



Indicators marked

- ◆ Up to 33 marked
- ◆ High level
- ◆ No weightings
- ◆ Parameters marked as whether the combination:

 1	Disadvantageous
 2	Neutral
 3	Advantageous

Parameters

- ◆ Financial - the most likely areas for what is proposed to work
 - ◆ Financial support- Needed
 - ◆ Financial support - Offered
 - ◆ Financial support - Guaranteed
 - ◆ Financial support - Revenue size
 - ◆ Financial support - Revenue duration per project
 - ◆ Total CAPEX and OPEX spend
 - ◆ Likely best countries for financial support

Parameters

💧 Socio-economic

- 💧 Skills available
- 💧 Employment
- 💧 Labour costs
- 💧 Port availability at reasonable cost
- 💧 Existing local supply chain
- 💧 Other barrier costs
- 💧 Likely best countries for socio-economic (in terms of GVA)

Parameters

- ◆ Other barriers
 - ◆ Resource availability
 - ◆ Grid
 - ◆ Environmental impact
 - ◆ Consenting - Grid
 - ◆ Consenting - Planning/licensing
 - ◆ Likely best countries for other barriers

Parameters

- ◆ Revenue opportunity
 - ◆ Market price of goods
 - ◆ Market demand
 - ◆ Market size
 - ◆ Annual market growth
 - ◆ Projected market growth over next five years
 - ◆ Fraction of market supplied from local supply
 - ◆ Projected market growth in local supply over next five years
 - ◆ Internal rate of return on investment

Parameters

- ◆ Growth drivers
 - ◆ Policy support
 - ◆ Pricing trend
 - ◆ Life cycle stage
 - ◆ Wider resource limits

Parameters

- ◆ Supply competition
 - ◆ Current supply
 - ◆ Future five years supply
 - ◆ Does demand outstrip supply?

Results

- 🍃 All advantageous overall as average score > 2.00
- 🍃 Order by average score:

Sector that determines sizing	Other Sector	Number of parameters marked	Number of parameters with disadvantageous marks	Fraction of parameters with disadvantageous marks	Average score	Rank on average score
Floating Offshore Wind	Desalination	33	2	6%	2.39	1
Fixed Offshore Wind	Aquaculture	31	3	10%	2.39	2
Floating Offshore Wind	Wave	33	3	9%	2.36	3
Floating Shipping Terminal	Aquaculture	31	1	3%	2.29	4
Floating Offshore Wind	Aquaculture	31	2	6%	2.26	6
Aquaculture	Wave	33	1	3%	2.27	5
Floating Shipping Terminal	Wave	33	3	9%	2.15	7

Results

Order by number of disadvantageous marks:

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Disadvantageous factors may be highly significant going forward

In order of number of disadvantageous marks ...

AQUACULTURE

+

FLOATING SHIPPING
TERMINAL

Disadvantageous

- Environmental impact
 - Pollution from shipping or platform activities could harm aquaculture

WAVE

+

AQUACULTURE

Disadvantageous

- Consenting - Grid
 - Aquaculture does not require grid to proceed so, if needed, its deployment is delayed

FLOATING OFFSHORE
WIND

+

DESALINATION

Disadvantageous

- Existing local supply chain
 - Many parts for both desalination and offshore wind are not locally produced.
- Consenting - Planning/licensing
 - Despite being easier to consent desalination at sea as no permits for water intake and discharge are needed, to avoid pumping water long distances the platform may need to be closer to shore than authorities will permit at some locations.

AQUACULTURE

+

FLOATING OFFSHORE
WIND

Disadvantageous

- 💧 Consenting - Grid
 - 💧 Aquaculture does not require grid to proceed so its deployment is delayed
- 💧 Pricing trend
 - 💧 Aquaculture costs may increase in deeper water further from shore beyond any savings

AQUACULTURE



FIXED OFFSHORE
WIND

Disadvantageous

- Any other significant cost barriers
 - Despite aquaculture damping waves potentially enabling longer periods of access to turbines, aquaculture may constrain the operation of the wind farm eradicating net benefits. Aquaculture contribution is relatively small.
- Consenting - Grid
 - Aquaculture does not require grid to proceed so its deployment is delayed
- Pricing trend
 - Combination may support reducing aquaculture costs within the wind farm but cost likely to be higher as further from shore

FLOATING OFFSHORE
WIND

+

WAVE

Disadvantageous

- Financial support - Revenue size
 - Despite more revenue per square km and more efficient use of transmission assets, wave may increase IRR above that of floating wind on its own. Fixed wind on its own has lower IRR than floating wind.
- Consenting - Grid
 - Potentially consenting larger grid connection
- Consenting - Planning/licensing
 - Combination potentially poses greater challenges than individual technologies

FLOATING SHIPPING
TERMINAL

+

WAVE

Disadvantageous

- 💧 Employment
 - 💧 Only provides a fraction of the jobs displaced from land transport
- 💧 Labour cost
 - 💧 Higher as offshore
- 💧 Market price of goods
 - 💧 Extra cost for security (scanning and weighing)

Briefly on economics

- ◆ What is your comparator?
- ◆ Fixed offshore wind continues to achieve LCOE reductions ahead of predications (DONG Borssele 1 and 2, July 2016)
- ◆ In June 2016 eleven major energy companies declared that the potential for LCOE reduction stating with "the right build out and regulatory framework the industry is confident that it can achieve cost levels below €80/MWh for projects reaching final investment decision in 2025, including the costs of connecting to the grid"
- ◆ Is there a believable pathway in a meaningful timeframe to compete with the comparator?

- ◆ Many, albeit developed, hypotheses that need validating
- ◆ Thank you for Maribe – especially enjoyed doing more than energy modelling
- ◆ Thank you for listening; mjb@bvgassociates.co.uk

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