



The Blue Economy: *Turning aspiration into opportunity*

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Ocean Business, April 2015



Turning Aspiration into Opportunity

- What is the Blue Economy?
 - And how big
- What is driving Blue Growth?
 - Global needs (eg energy, food)
- How should we respond?
 - Understanding markets & value chains
- Can we do better?
 - How to organise ourselves

Macro-Economic Analysis



- Analysis can create the 'big picture'
 - Shows the Blue Economy is important
 - Drives top-down policy
- How to influence micro-economic decisions?
 - Bottom-up investment by firms
 - New employment

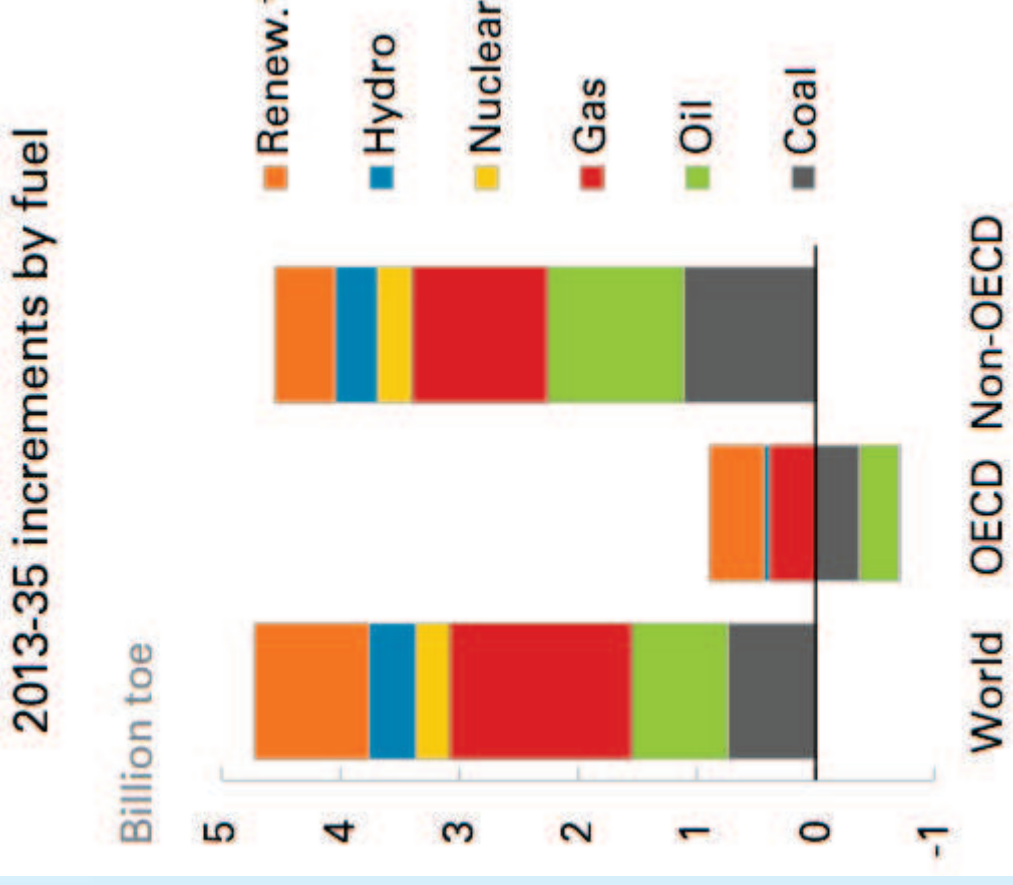


UK Blue Economy Size

	Direct GVA £B	Direct jobs	Total GVA £B	Total jobs
Transport & logistics	13.59	265,500	33.91	685,801
Leisure	3.14	100,470	7.50	273,322
Defence & security	3.55	98,245	8.48	267,269
Energy resources	20.37	171,250	48.58	465,551
Living resources	0.81	31,633	1.93	86,055
Mineral resources	0.11	1,670	0.26	4,543
<i>Vessel construction, propulsion & fuels</i>	1.41	37,000	3.60	81,000
<i>Marine equipment & instrumentation</i>	3.57	156,000	8.60	415,775
<i>Marine autonomous systems</i>	0.00	0	0.00	0
<i>Maritime ICT</i>	2.70	26,750	6.45	72,772
<i>Marine & maritime services</i>	2.54	46,550	5.97	135,582
	51.79	935,068	125.29	2,487,670

- Based on an aggregation by MSE of:
 - Oxford Economics analysis of ports, shipping & maritime service (2011)
 - Oxford Economics update of above + marine equipment, ship/boat building, renewable energy & R&D (2012)
 - Crown Estate analysis of all sectors including oil & gas (2005)

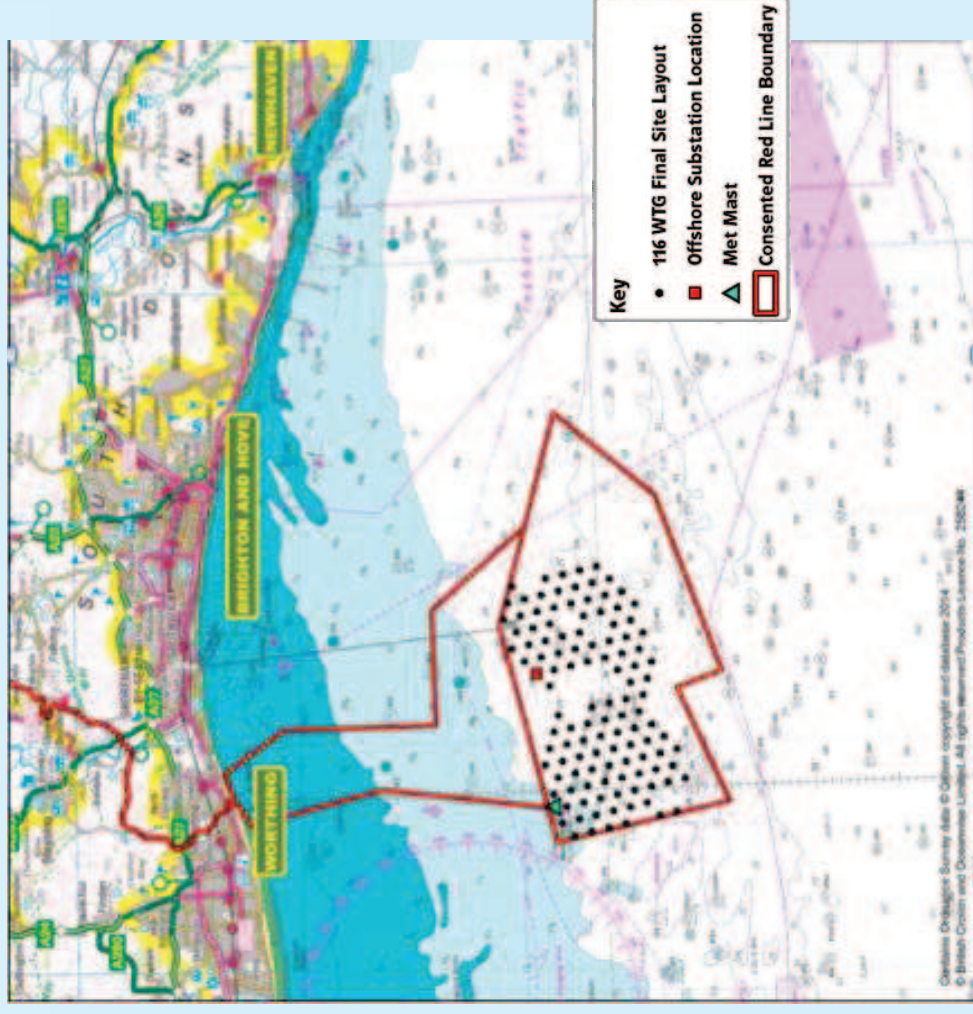
Energy Demand Forecast (BP Energy Outlook 2015)



- OECD countries are forecast to displace oil and coal with gas and renewables
 - Significant role for marine & maritime
- Use that expertise to help minimise projected growth in oil and coal use in non-OECD countries

Rampion - Final project design

- 116 turbines
- Hub height 84m / Tip height 140m
- 13-20km off Sussex coast
- 400MW installed electrical capacity
- 72km² wind farm site area
- Inter array cables to one substation
- Export cable route being finalised
- Each year in numbers:
 - Generate 1,366GWh power output
 - Offset almost 600,000 tonnes of CO₂
 - Supply equivalent of over 290,000 homes, more than 4 in 10 homes in East & West Sussex, Brighton & Hove



Rampion Opportunities for Local & Regional Suppliers

- Balance of Plant
 - Offshore cabling components & sub-systems
 - Onshore cabling components & sub-systems
 - Onshore sub-station, equipment & related services
 - Design & engineering services
 - Installation & commissioning
- Operations & Maintenance
 - Servicing
 - Repair
 - Port logistics
 - Training
 - O&M port development
- Based on Eon's Robin Rigg wind farm, local suppliers could secure contracts worth:
 - £25m in BoP
- £10m/year in O&M

Maritime Value Chains



Maritime Industrial & Science Base

Vessels & marine systems

Autonomous systems & robotics

Maritime ICT & big data

Maritime services & advanced skills



3. Key innovations priorities

Overall: Cutting energy costs by innovating (by 50 -75%)

- Scale of array installation
- Supply chain optimisation
- Appropriate financing

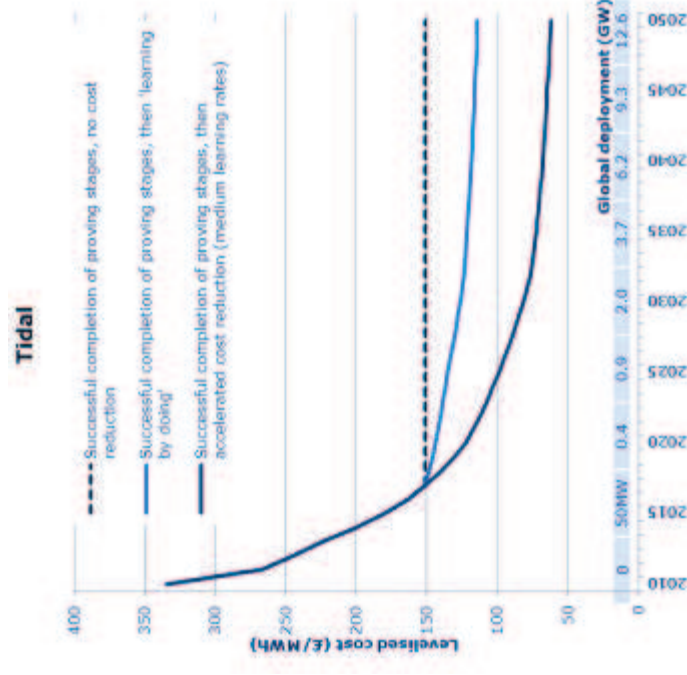
R&D activities dedicated to:

1. First arrays

- Cabling
- Device interactions
- Multi-array deployment

2. Technologies

- New and better concept (wave)
- Installation (drilled structures)
- O&M activities (faster / lower specs – retrieval operations)
- wet connections



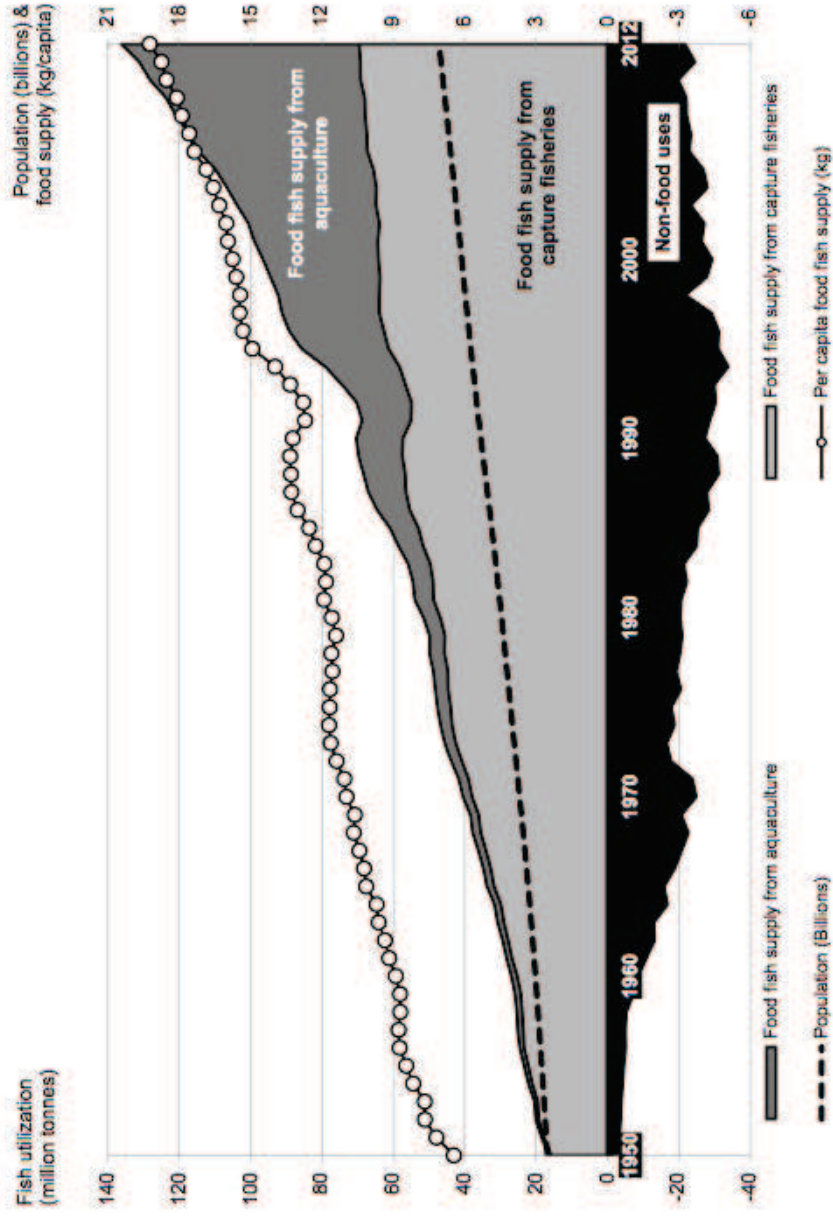
Low-cost Anchoring

- Foundations are major cost burden for wave and tidal
 - Impact piles are costly & noisy, and depend on specialist vessels
 - Gravity anchors are costly & limited in load capacity
- SAMED screw pile technology
 - Collaboration of MSE and Sustainable Marine Energy Ltd
 - Supported by DECC
- Prototype rig fabricated & trialled
 - Four pilot anchors installed off Yarmouth
- Also major opportunity in mooring of aquaculture facilities

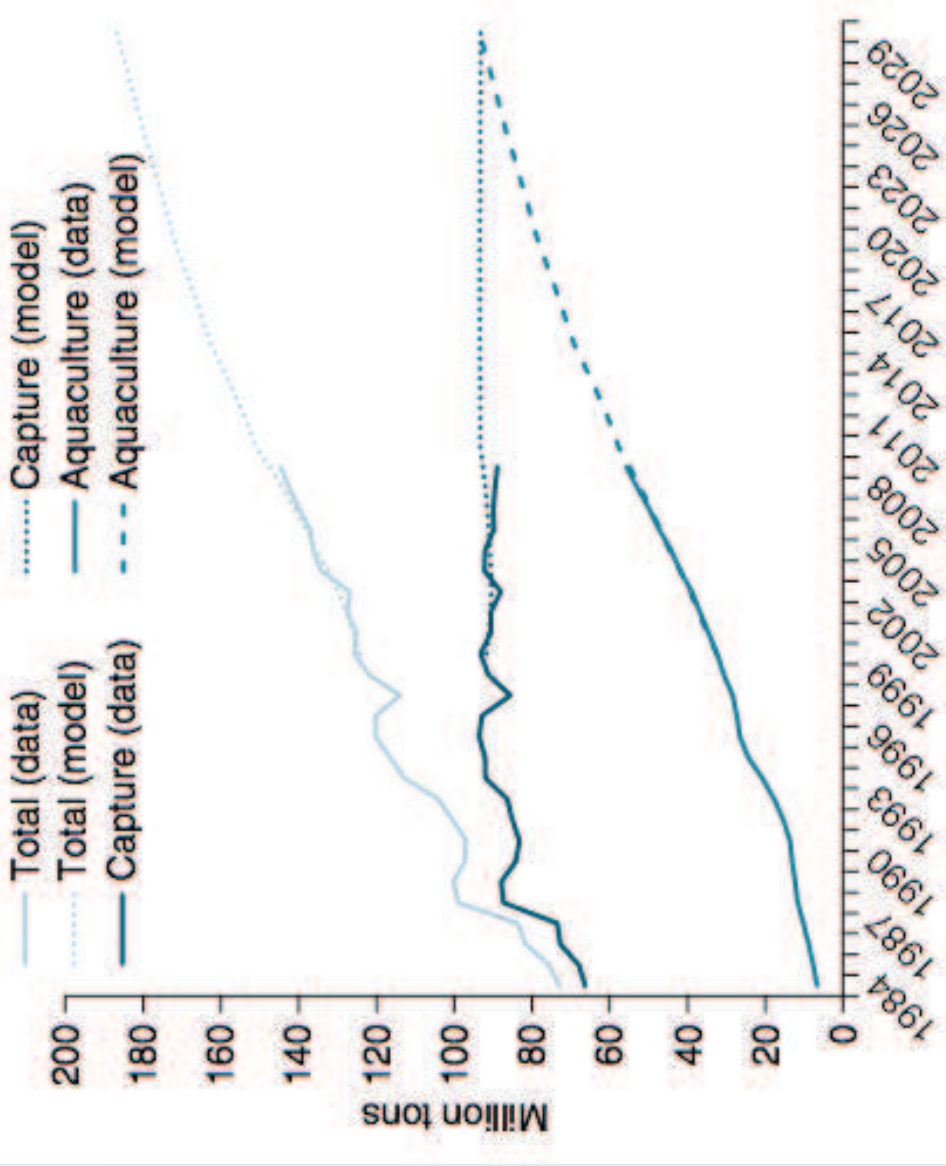


Global Aquaculture Trends (FAO)

Figure 1
World fish utilization and supply/Utilisation et disponibilités mondiales de poisson/
Utilización y suministro mundiales de pescado



Future Opportunities

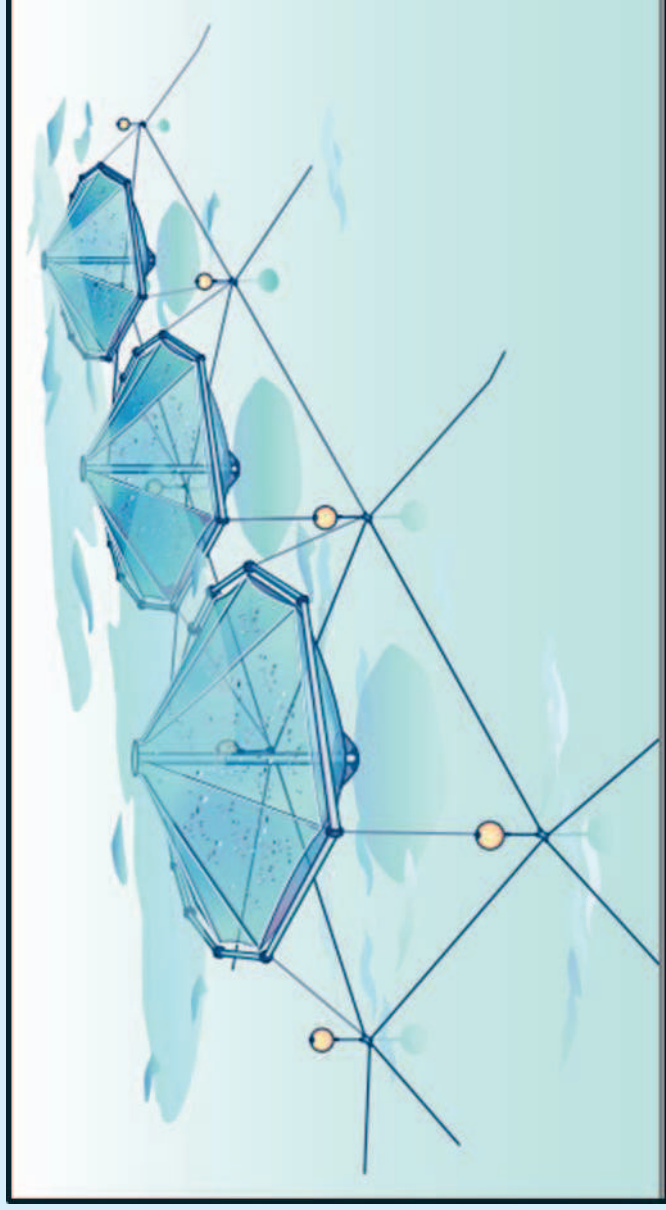


Sources: FishStat and IMPACT model projections.

- Aquaculture production to increase from 50MT to 90MT in 15 years
 - Around 8% growth pa
- Assumes level capture production
 - Only with improved productivity
- What are the business opportunities?

Offshore Aquaculture Opportunities

- Mooring & anchoring systems
- Deployment, maintenance, repair, retrieval
- Monitoring, controls, autonomy, unmanned platforms
- Operations support, feed supply, export to shore etc



Blue Growth Markets



Value-chain markets



Market categories



Market segments



Autonomous Systems - Information Services

Value Chain serving multiple end-user markets

Components
(eg sensors)

Equipment &
platforms

Integrated
systems

Added-value
services

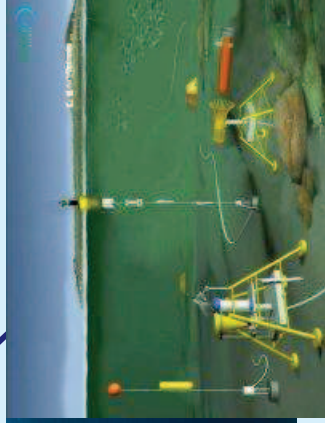
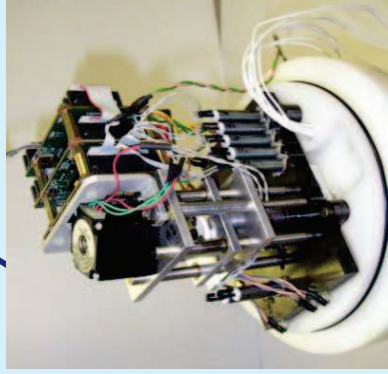
Identification
& tracking

Spill
response

Asset
management

Seabed
survey &
mining

Fisheries
management

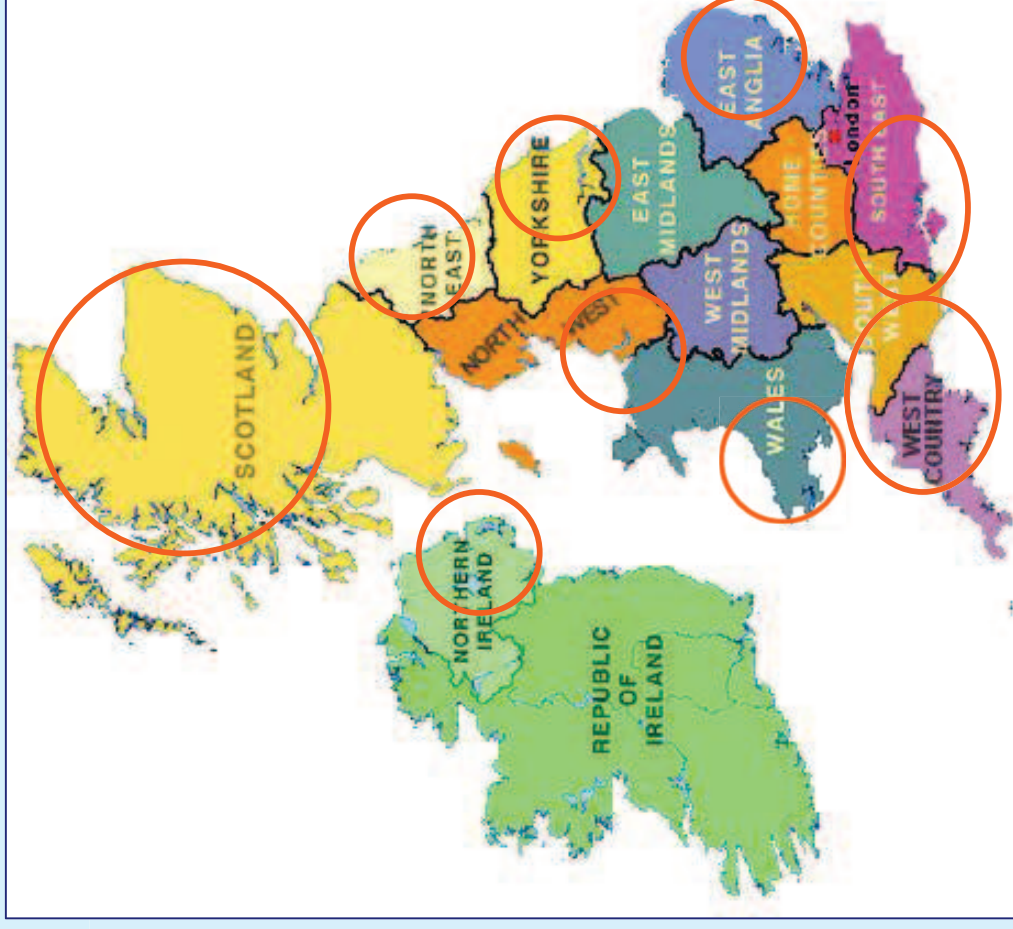


How is UK positioned?

- Large, capable and diversified industry base
- Excellent science base and research infrastructure
- Good commitment to investment in national technology priorities
 - BUT
- Poor alignment with full extent of blue economy
- Investment in blue growth opportunities will be bottom-up. Need to mobilise SMEs
- Scope to join up Catapults (hubs) with existing maritime centres of capability (spokes)

UK Blue Economy Capacity

- Largest in EU but fragmented:
 - Regions
 - Sectors
 - Government depts.
 - Science/Industry/SME
- Create a Blue Economy cluster alliance or Catapult
 - Capture bottom-up strengths
 - Deliver top-down goals
 - Achieve critical mass
 - Present unified capability
 - Provide spokes to existing Catapults



Concluding Remarks

- The Blue Economy is growing, offering business opportunities to a wide range of firms
 - Along value chains serving marine & maritime customers
 - Across diverse markets, including emerging areas in energy, aquaculture, security, logistics
- The UK is well-placed to exploit this potential
 - Strong industrial capacity
 - Strong science & technology base
 - Good international links
- But fragmentation is a major barrier
 - Emerging Blue Growth opportunities are not widely recognised
 - Integrated capacity is not promoted
- Need to organise ourselves better
 - Joined-up priorities across the full extent of the Blue Economy
 - Add value to 'hubs' (eg Catapults) by linking to 'spokes' (ie strong maritime regions/clusters)