Supporting Marine Research Knowledge Exchange for Blue Growth

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Regional Marine Clusters

- What are the challenges for K&I Clusters
  - ***UK***
    - Value Chains
  - ***Opportunities***
  - ***Cross Border Co-operation***
  - ***Market Focus Approach***
  - ***Science / Societal Challenges***
  - ***What do we need? EEIG***

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
Vessel construction, propulsion & fuels	*1.41*	*37,000*	*3.60*	*81,000*
Marine equipment & instrumentation	*3.57*	*156,000*	*8.60*	*415,775*
Marine autonomous systems	*0.00*	*0*	*0.00*	*0*
Maritime ICT	*2.70*	*26,750*	*6.45*	*72,772*
Marine & maritime services	*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)***

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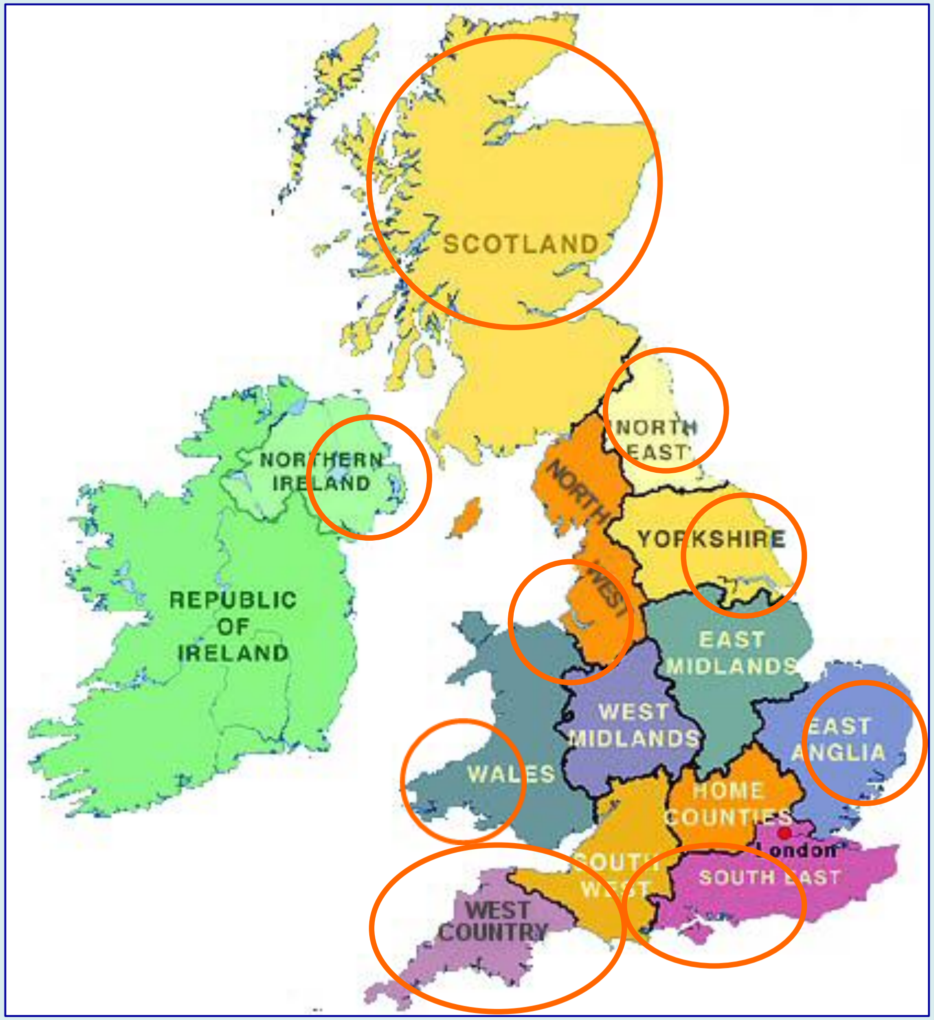
UK Blue Economy Capacity



- 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***

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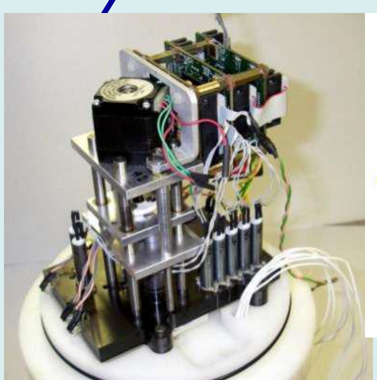
Autonomous Systems – Value Chain

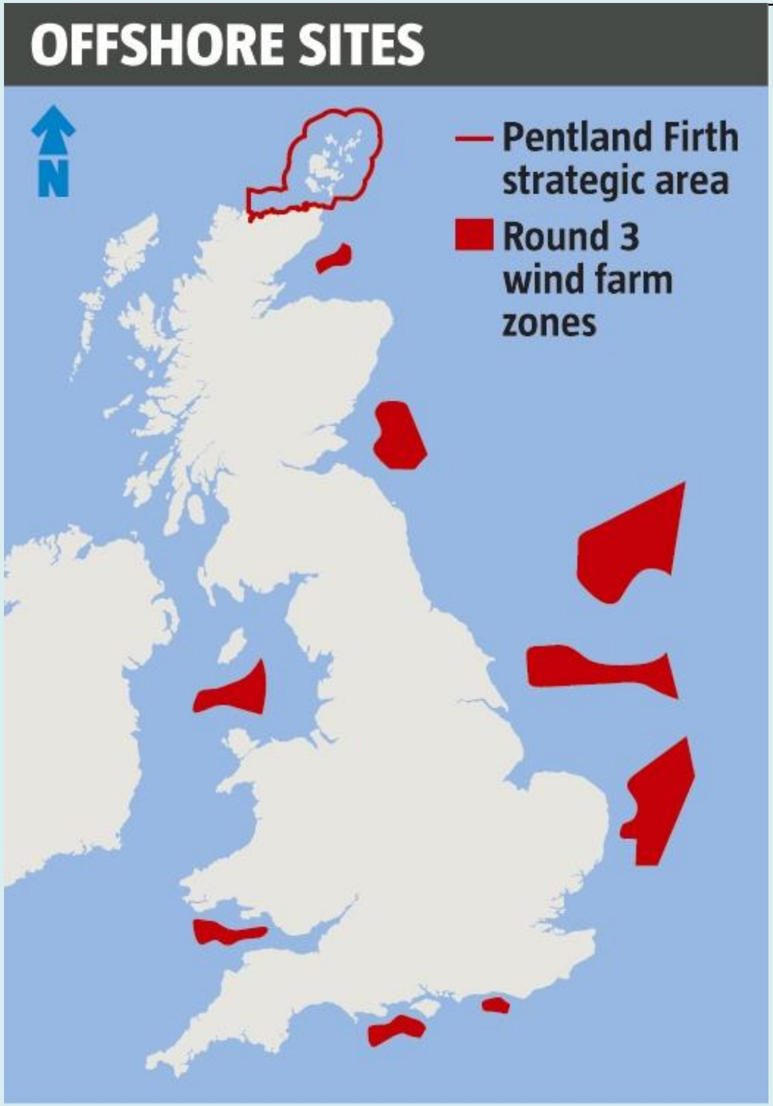
Value Chain serving multiple end-user markets

Components (eg sensors) → Equipment & platforms → Integrated systems → Added-value services →

- Identification & tracking
- Spill response
- Asset management
- Seabed survey & mining
- Fisheries management



UK Offshore & Marine Renewables



- Offshore wind capacity:
  - *4 GW in operation*
  - *12.7 GW under construction or approved*
  - *5.2 GW in planning*
- Wave & tidal capacity:
  - *Currently at tech. demo. stage (10MW)*
  - *Swansea lagoon (320MW) awaiting planning decision*
  - *Cardiff lagoon (1.8 – 2.8 GW) at pre-planning*

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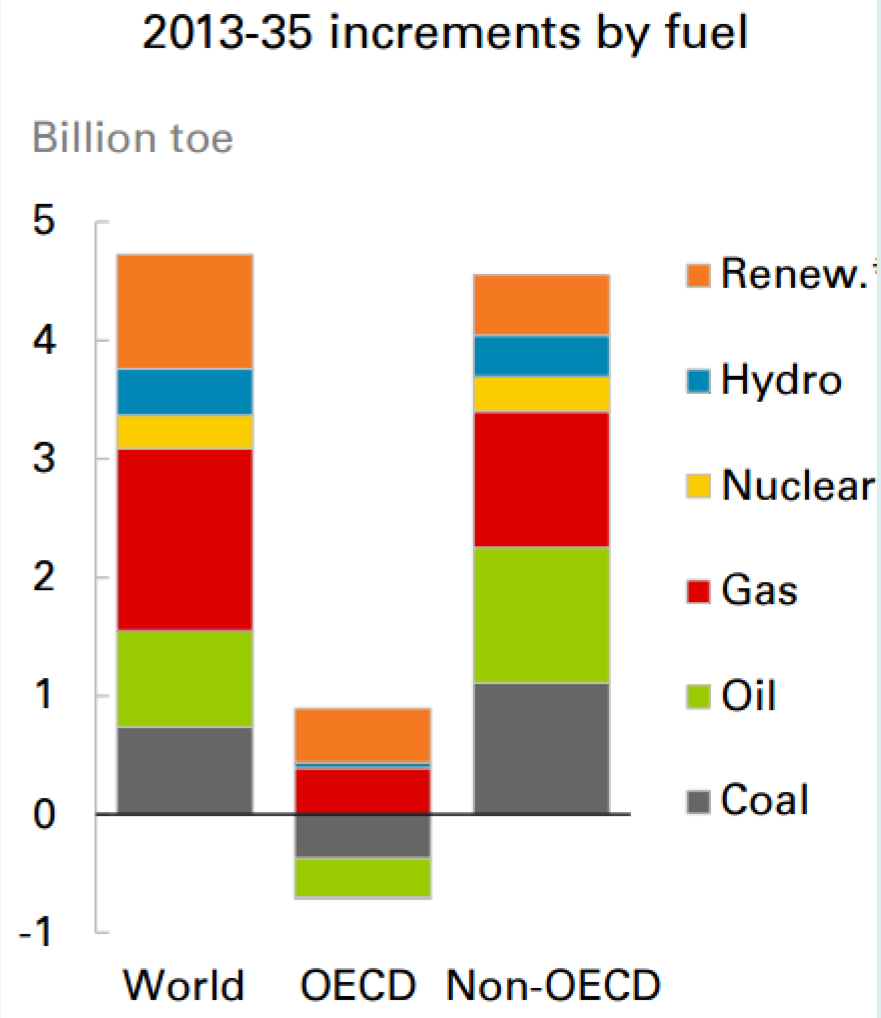
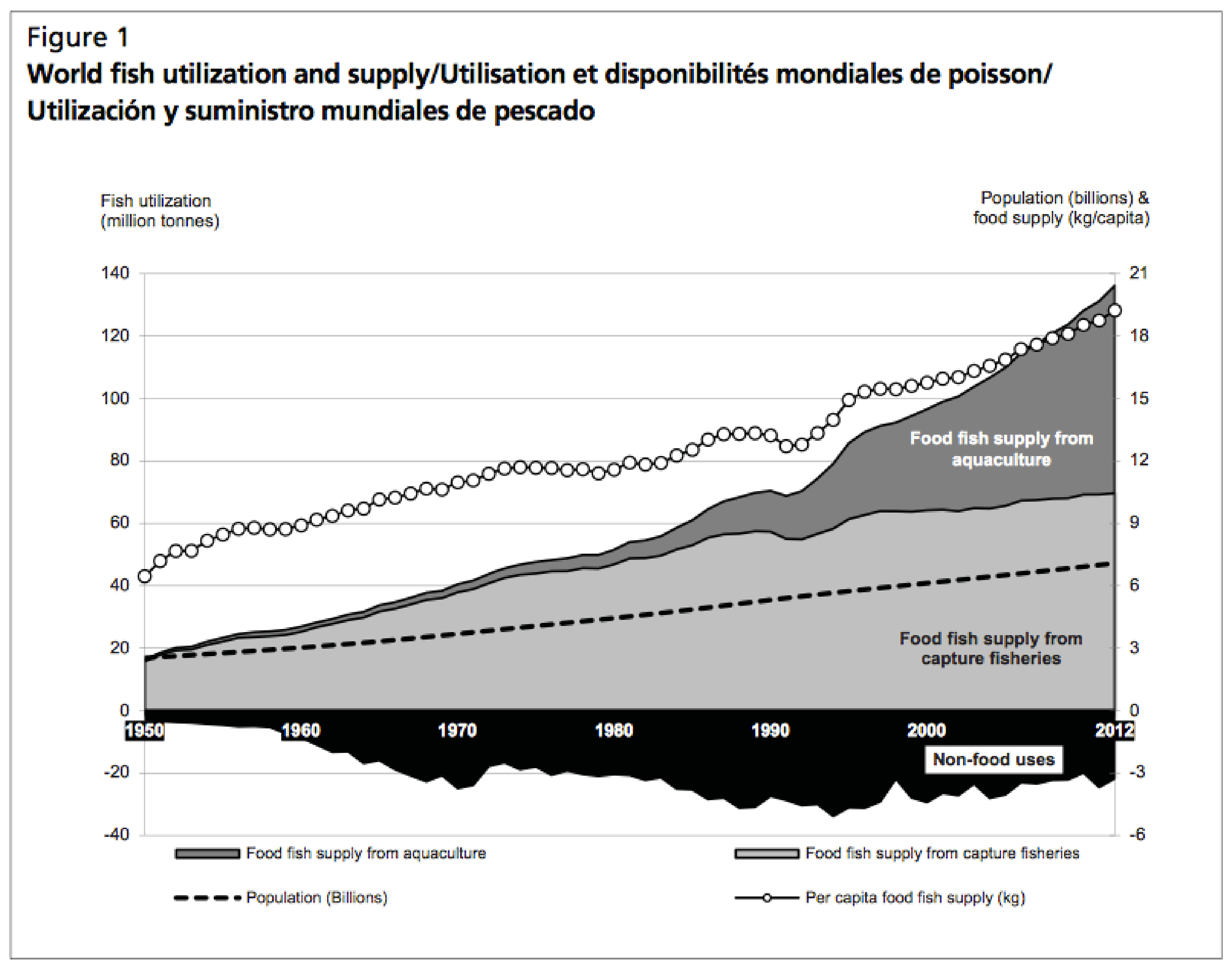
Energy Demand Forecast
(BP Energy Outlook 2015)

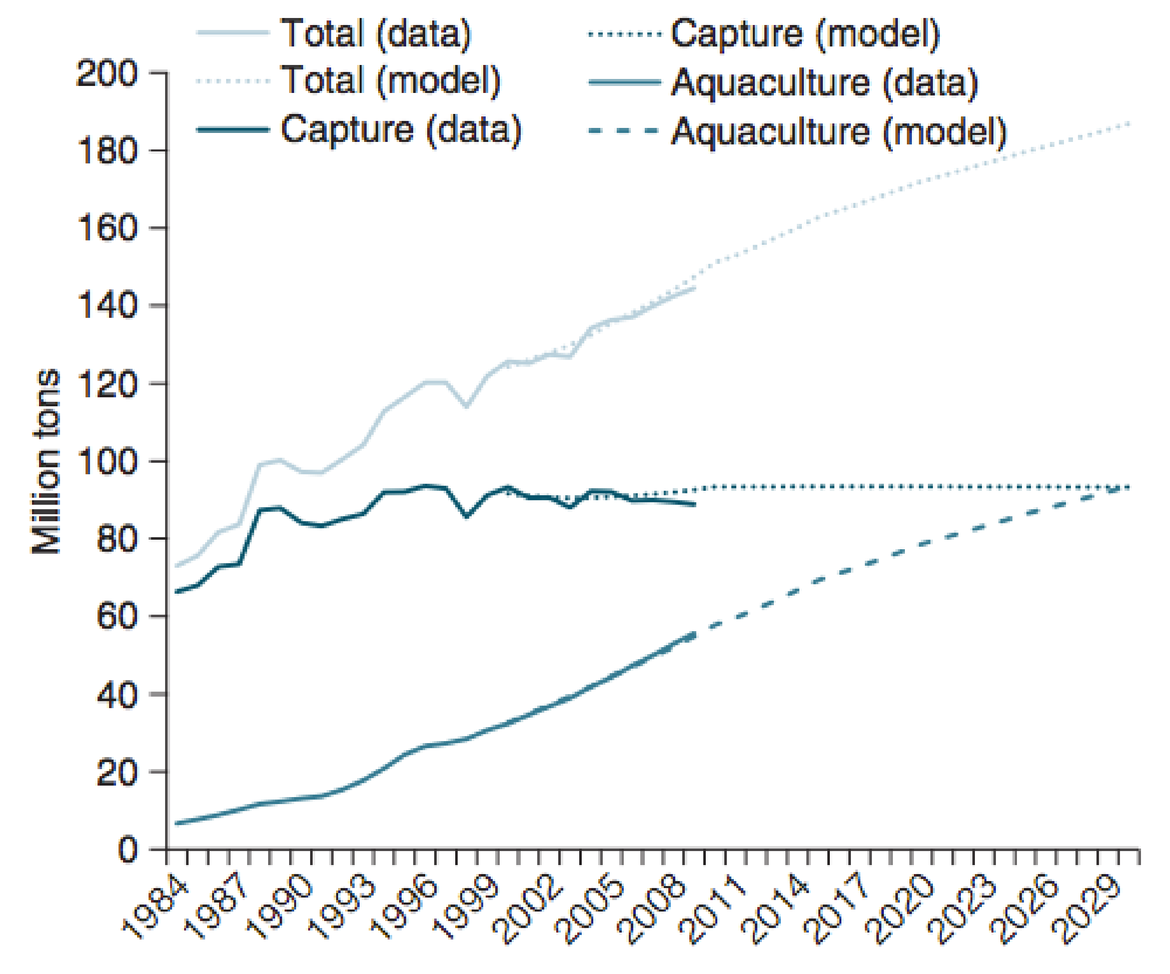


- OECD countries are forecast to displace oil and coal with gas and renewables
  - *Significant role for marine & maritime*
- Use that expertise to help minimise projected growth in oil and coal use in non-OECD countries

Global Aquaculture Trends (FAO)



Future Opportunities

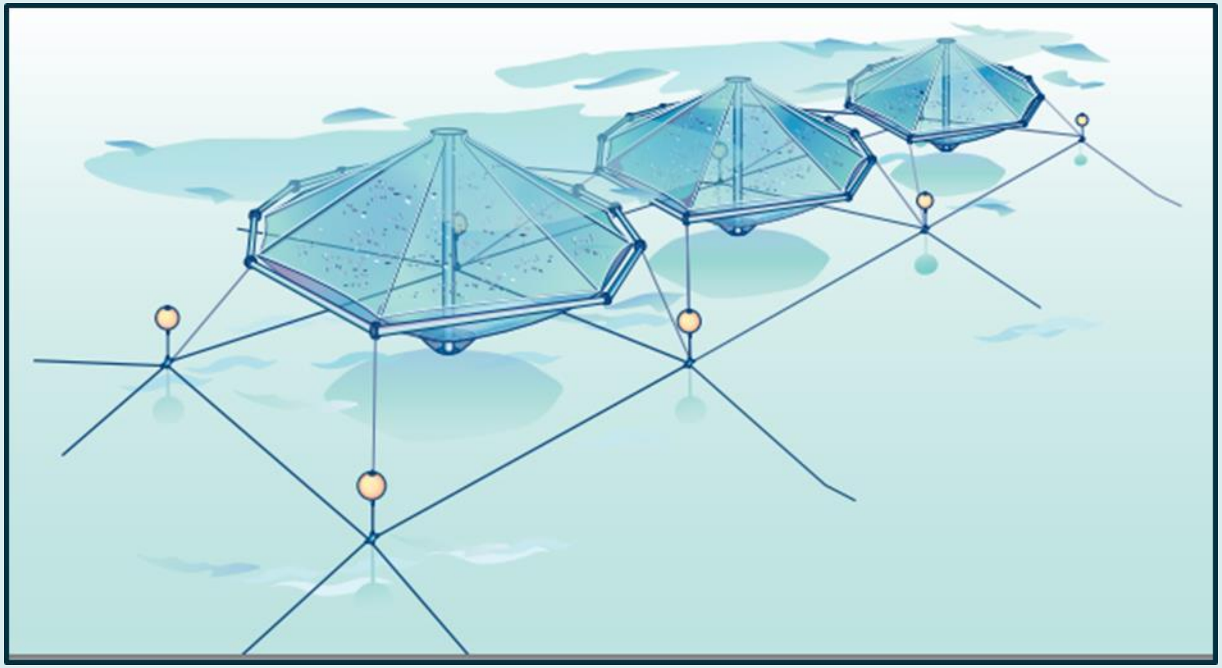


Sources: FishStat and IMPACT model projections.

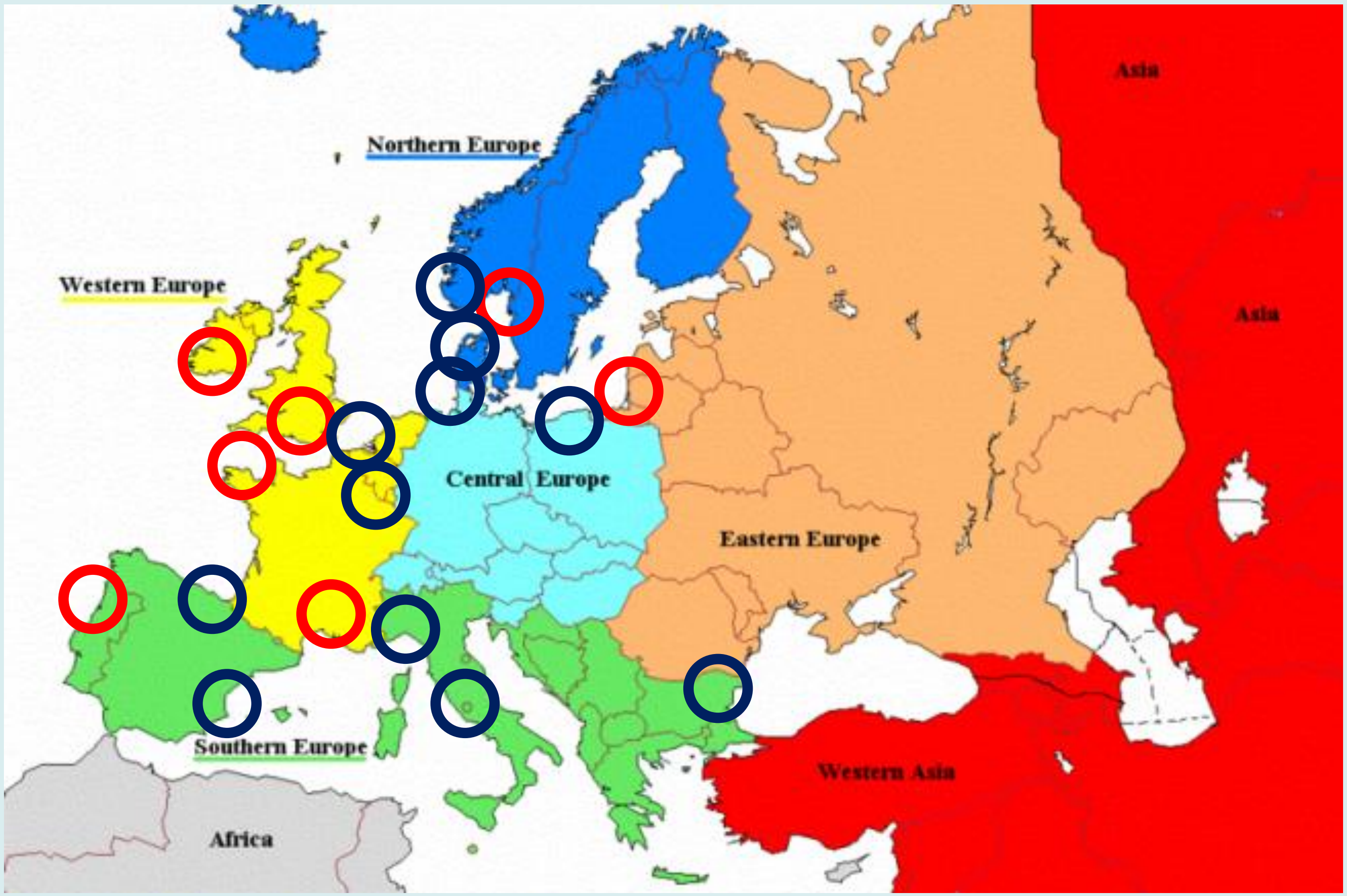
- Aquaculture production to increase from 50MT to 90MT in 15 years
  - ***Around 8% growth pa***
- Assumes level capture production
  - ***Only with improved productivity***
- What are the business opportunities?

Offshore Aquaculture Opportunities

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



Network of EU Innovative Marine Clusters



Clusters within MSE projects

Maritime Clusters for further cooperation

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Cluster Co-operation

- Seven marine regional research-driven clusters have participated in marine Regions of Knowledge projects:
  - ***EMSAC (2009-2012)***
  - ***REMCAP (2012-2015)***
- Effective relationships have been built up between these clusters
  - ***These will be vital to exploit and drive growth in the Blue Economy***

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Blue Growth Markets

Value-chain markets

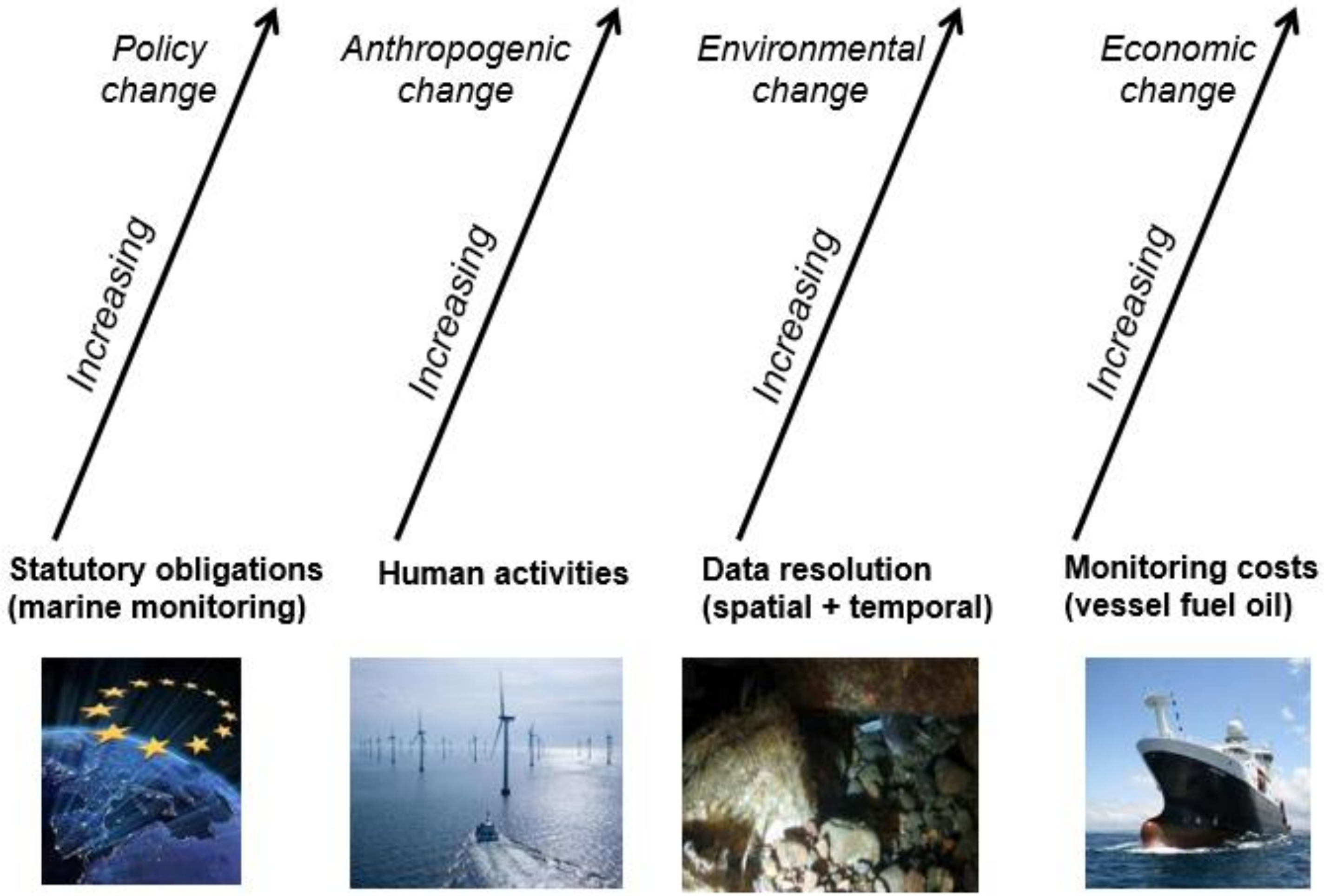
- Vessel construction, propulsion & fuels
- Marine equipment & instrumentation
- Marine autonomous systems
- Maritime ICT ('Smart Ocean')
- Marine & maritime services

Market categories / Market segments

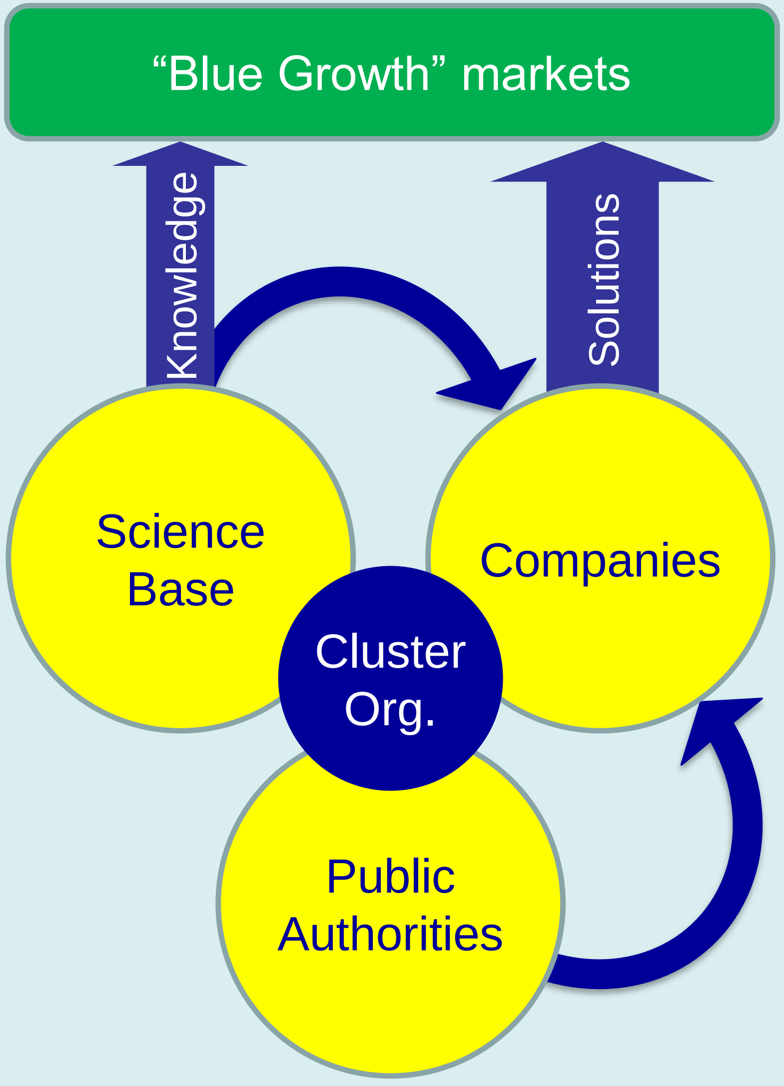
Market categories	Market segments			
Transport & logistics	Ports & logistics	Shipping & shipbuilding		
Leisure	Leisure craft, marinas	Cruise		
Defence & security	Naval	Surveillance	Coastal protection	Eco-systems
Energy resources	Oil & gas	Offshore Wind	Wave & tidal	Biofuels
Living resources	Fishing	Aquaculture	Blue biotech	
Mineral resources	Aggregates	Seabed mining		

Mature Growth-phase Pre-development

Marine mapping and monitoring: an escalating problem…….



Triple Helix Cluster Networking



- Each cluster can bring knowledge and business solutions into the blue economy
- Markets are European and global
  - *Fragmented solutions are inefficient*
- Need a Europe-wide collaboration framework
  - *The knowledge-base is well networked, but*
  - *SMEs & public authorities lack cross-border networks*

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Summary Proposition

- Could we create a new legal entity to formalise and expand this network of relationships
  - ***A European Economic Interest Grouping (EEIG)***
  - ***Can participate in collaborative projects, accessing the capabilities of its constituent clusters***
  - ***Open to additional regional marine clusters***
  - ***Promote EU-wide capacity for marine innovation to the international market***

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EEIG

- EEIG could:
  - ***Facilitate cross-border networking between marine regional research-driven clusters***
    - Sharing experience of cluster organisations
    - Linking with regional sea-basin strategies
  - ***Provide a framework for EU consortium building***
    - Horizon 2020, ESA, EC tenders etc
    - Cross-border partner/client access for SMEs
  - ***Promote the collective strengths of its members to the international market***
    - In aggregation, EU has a major share of the global marine/maritime innovation capacity, more than US
    - This strength has not been promoted internationally
  - ***Maintain an on-line database of accessible research facilities***
    - Input to smart specialisation

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EEIG

- Important that any EEIG would not:
  - ***Conflict with ENMC[1]***
    - Focus on growth & pre-growth markets, to complement ENMC's focus on traditional sectors (shipping, shipbuilding etc)
  - ***Duplicate existing EEIGs such as BONUS and Submariner***
    - These are focused on Baltic Sea Region
    - EMSAC will expand awareness of these outside Baltic, and create linkage with other sea-basin strategies (eg Mediterranean and Atlantic)

1 – European Network of Maritime Clusters

EEIG Potential

- Maintain a central web portal to promote the collective capabilities
  - ***Cluster objectives***
  - ***Members***
  - ***Facilities***
  - ***Project portfolios***
- Be a legal entity to participate in projects
  - ***Bringing access to Europe's marine business & research communities***
  - ***Work performed by one or more member clusters***
- Provide an exchange for member clusters
  - ***Disseminate project results widely and efficiently***
  - ***Identify project partners***
  - ***Integrated calendar of marine events, cross-promotion***

Any Questions

Thank you for listening