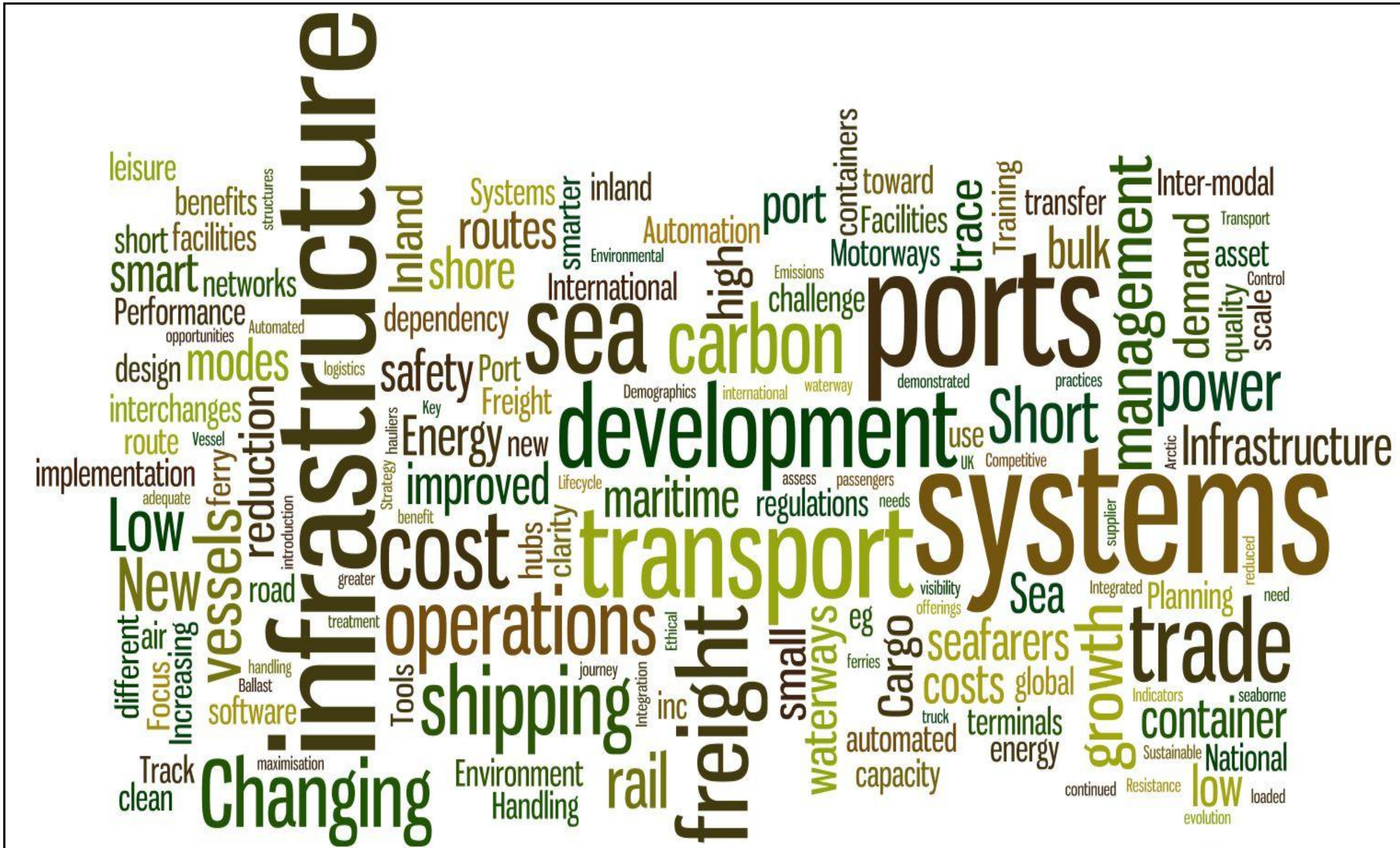
UK Marine Industries Roadmap & Capability Study

Workshop E: Ports and Infrastructure, 30 November



Technology Strategy Board
Driving Innovation

UK Marine Industries Alliance

BIS Department for Business Innovation & Skills

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Executive Summary

This report results from a one-day workshop to assist the Technology Strategy Board, BIS, UK Marine Industries Alliance and the Transport KTN to develop a roadmap to identify future priority opportunities and capability needs for the UK Marine Industries. The workshop was the final one of five "Deep Dive" explorations of the sector, focussing on Ports and Infrastructure. The workshop took place in London on 30 November 2011, with input from around 20 experts drawn from across the Marine Industry, academia and other stakeholders. The workshop took a sub-set of the landscape roadmap, developed in June 2011, which was then developed further to identify priority trends & drivers and then to identify and characterise around 40 Market Opportunities in Ports and Infrastructure.

Participants contributed before the workshop by providing their perspectives in a roadmap template – identifying priority Drivers, Opportunities, Capabilities and Enablers in the Short, Medium and Long timeframes. These were consolidated ahead of the workshop to provide a start point to which further issues were added and priorities identified. The most important market opportunities were then highlighted, where UK capability could deliver against major global market needs. These assessments were based on defined criteria for Value (global & UK market, competitive strength, added value and impact on societal and environmental challenges) and Capability (in the marine industry, academia, research organisations and from adjacent industries – see Appendix C for details.)

In prioritising relevant Trends & Drivers (see section 1), there was a strong emphasis on a move towards integrated / multi-modal transport systems to support the migration of freight from road coastal shipping , driven by the changing attitudes toward different freight modes which in turn will be driven by fuel scarcity / cost and legislation to reduce CO_2 and other emissions. Implementation of track & trace solutions and containerisation, as well changing consumer demand and skills shortages would necessitate more automation and integration of data. The opening of the Arctic together with expanded global trade and the move towards hub and spoke models for international freight shipping might yield a 'once in a lifetime' opportunity for UK to establish a strategic position, providing UK & International political agendas could be aligned.

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Executive Summary (continued)

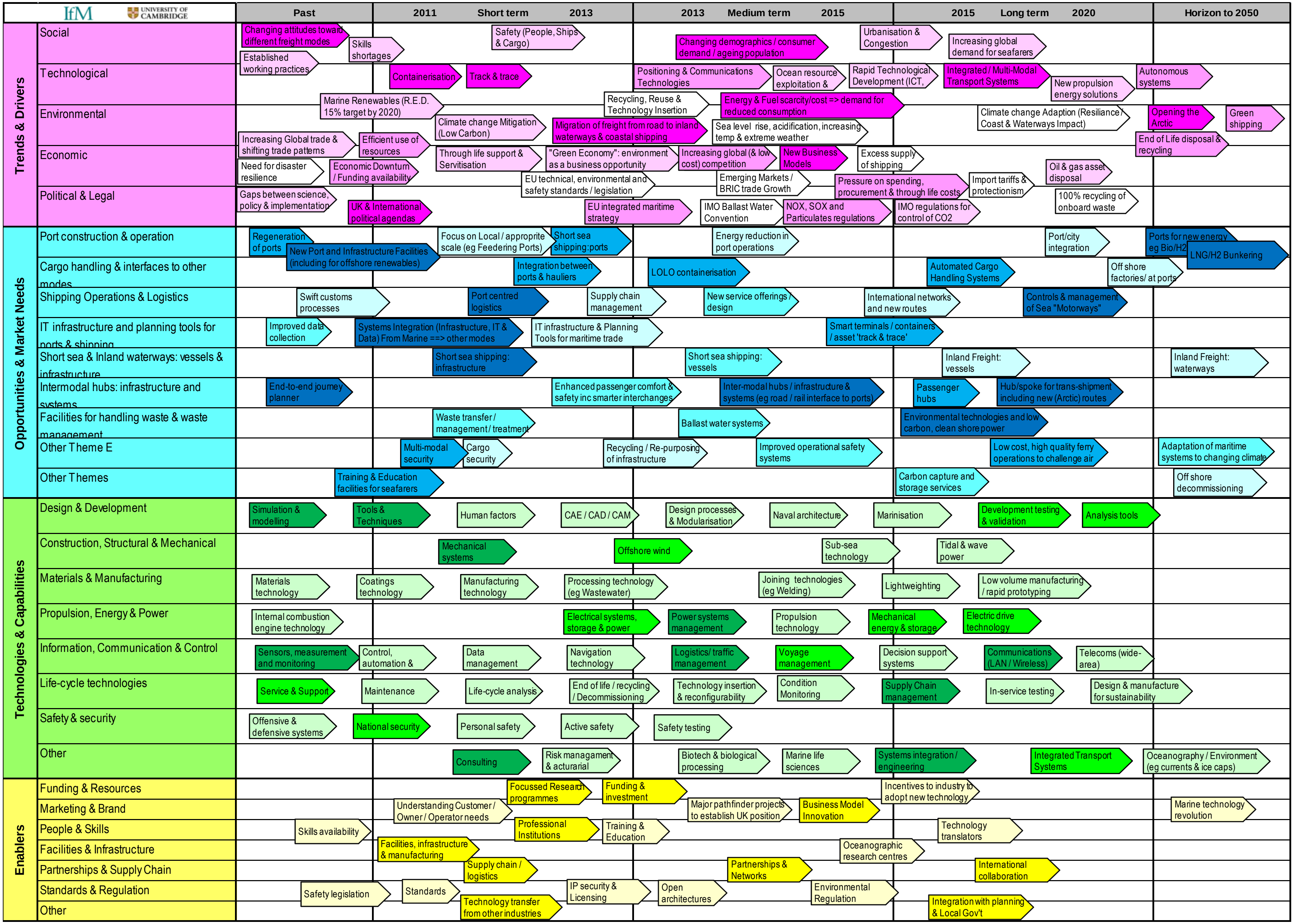
Priority Opportunities (see section 3) were identified across a range of areas, covering the integration of transport systems and operations in marine and between modes, re-purposing of existing ports and provision of new, and delivery of infrastructure and related services at these. The leading opportunities included systems integration (infrastructure, IT & data) from marine transport (building on strengths in this area) into other modes; new port and infrastructure facilities, particularly to serve offshore renewables support and construction; environmental services and low carbon, clean shore power for vessels in port; establishing a position as a major hub for trans-shipment (particularly in the context of new Arctic shipping routes; operation of sea “motorways" & associated short sea shipping infrastructure; bunkering (and other value-added services) associated with LNG and H2; inter-modal hubs / infrastructure & systems (eg road / rail interface to ports); end-to-end journey planning and automated cargo handling systems.

Of these opportunities, the first six were explored in more detail – to characterise the market value and identify relevant sources of UK capability for delivery (and potential gaps that will need to be filled. It was noted that the characterisations would benefit from further validation due to the limited number of workshop participants with direct insights into port operations.

In support of these opportunities, a wide range of capabilities were identified from within the Marine Industries but also in academia and research organisations. The most relevant areas of capability to support these market opportunities were: logistics and traffic management; simulation & modelling; power systems management; sensors, measurement and monitoring technology; supply chain management; consulting; communications; systems integration; mechanical systems and integrated transport systems.

The workshop also identified other key enablers for success, underpinning these capabilities as: facilities, infrastructure & manufacturing capacity; business model innovation; funding & investment; focussed research programmes; supply chain / logistics and professional institutions.

1. Roadmap Landscape



2. Landscape Linkages

Trends & Drivers

Market Opportunities		1. Integrated / Multi-Modal Transport Systems	2. Green shipping	3. Efficient use of resources	4. Positioning & Communications Technologies	5. Marine Renewables (R.E.D. 15% target by 2020)	6. New Business Models	7. Ethical / Green consumers	8. "Green Economy": environment as a business opportunity	9. Climate change Mitigation (Low Carbon)	10. NOX, SOX and Particulates regulations	11. Urbanisation & Congestion	12. Ocean resource exploitation & Blue Biotechnology
A Systems Integration	4	1	1	1	1								
B New port & infrastructure facilities	7			1		1	1	1	1	1			1
C Environmental Technologies	7		1			1	1	1	1	1	1		
D Hub Spoke for trans shipping	5	1		1	1		1					1	
E Sea Motorways & SSS Infrastructure	4	1			1						1	1	
F LNG/H2 Bunkering	6	1	1			1		1	1				1
		4	3	3	3	3	3	3	3	2	2	2	2

Capabilities

Market Opportunities	1. Logistics/ traffic management	2. Simulation & modelling	3. Power systems management	4. Sensors, measurement and monitoring technology	5. Supply Chain management	6. Consulting	7. Communications (LAN / Wireless)	8. Systems integration / engineering	9. Tools & Techniques	10. Mechanical systems	11. Integrated Transport Systems	12. Electrical systems, storage & power infrastructure	13. Analysis tools	14. Development testing & validation	15. National security	16. Service & Support	17. Electric drive technology	18. Mechanical energy & storage technology	19. Voyage management	20. Offshore wind
A Systems Integration	3	3	2	3	3	3	3	3	3		3		3	3	3	3	1	2	3	
B New port & infrastructure facilities	1	3	3	3	1	3	1	2	3	3	1	3	3	3		1		3		3
C Environmental Technologies	2	2	3	3		3		1	2		1	3					3	2	1	2
D Hub Spoke for trans shipping	3	2	2	2	3		3			3	3				2				1	
E Sea Motorways & SSS Infrastructure	3	3	1		3		3	3	1	1			3	3	1	3			1	
F LNG/H2 Bunkering	2	2	2	2	2	3		3	2	3		3	3	2	2	3	2	1	1	3
	14	15	13	13	12	12	10	12	11	10	8	9	12	11	8	10	6	8	7	8

Enablers

Market Opportunities	1. Facilities, infrastructure & manufacturing capacity	2. Business Model Innovation	3. Funding & investment	4. Focussed Research programmes	5. Supply chain / logistics	6. Professional Institutions	7. Partnerships & Networks	8. International collaboration	9. Integration with planning & Local Gov't	10. Technology transfer from other industries	11. Open architectures	12. Understanding Customer / Owner / Operator needs	
A Systems Integration	1	1	1					1		1	1	1	54
B New port & infrastructure facilities	1		1	1		1		1	1				46
C Environmental Technologies		1	1	1						1			32
D Hub Spoke for trans shipping	1			1	1	1	1	1	1			1	32
E Sea Motorways & SSS Infrastructure	1	1			1		1			1	1		35
F LNG/H2 Bunkering	1	1	1	1	1	1	1		1				49
	5	4	4	4	3	3	3	3	3	3	2	2	

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3. Priority Market Opportunities (summary)

Opportunities		Market Attractiveness:					Triple bottom-line		Value	Fit with UK Capability						Fit	Total
Topic	Opportunity	Global Market Size	Home (UK) market size	Strength of competition	Added Value / Margin	Cross-sector opportunity	Planet / Environmental	People / Societal	Weighted Value	Marine Industry	University / Academic	RTO / Design Services	Other Industry	Other UK resources	Timeliness	Weighted Capability	Combined Value & Fit
A	Systems Integration	3	2	2	3	4	3	3		3	3	2	3	4	3		
B	New port & infrastructure facilities	3	2	1	2	2	2	2		2	3	3	3	3	2		
C	Environmental Technologies	4	3	2	4	3	3	1		3	4	2	3	3	2		
D	Hub Spoke for trans shipping	4	3	0	1.5	3	2	2		1.5	2	2	2		1		
E	Sea Motorways & SSS Infrastructure	1	1	3	3	2	2	2		2	4	2	1	3	1		
F	LNG/H2 Bunkering	4	2	2	1	4	4	2		2	2	4	3	4	1		

See over for outputs from breakout group exploration of Priority Market Opportunities.

Key: **Black text – original team input**

Red text – carousel group comments

4. Capability - Ranked

Capabilities		A	B	C	D	E	F	
		Systems Integration	New port & infrastructure facilities	Environmental Technologies	Hub Spoke for trans shipping	Sea Motorways & SSS Infrastructure	LNG/H2 Bunkering	Total
Ranked capabilities (top-level grouping)								
I Total	Information, Communication & Control							
A Total	Design & Development							
L Total	Life-cycle technologies							
P Total	Propulsion, Energy & Power							
O Total	Other							
S Total	Safety & security							
C Total	Construction, Structural & Mechanical							
M Total	Materials & Manufacturing							
Ranked capabilities (detail)								
I5	Logistics/ traffic management	3	1	2	3	3	2	
A1	Simulation & modelling	3	3	2	2	3	2	
P5	Power systems management	2	3	3	2	1	2	
I1	Sensors, measurement and monitoring technology	3	3	3	2	0	2	
L7	Supply Chain management	3	1	0	3	3	2	
O3	Consulting	3	3	3	0	0	3	
I8	Communications (LAN / Wireless)	3	1	0	3	3	0	
O7	Systems integration / engineering	3	2	1	0	3	3	
A2	Tools & Techniques	3	3	2	0	1	2	
C1	Mechanical systems	0	3	0	3	1	3	
O5	Integrated Transport Systems	3	1	1	3	0	0	
P4	Electrical systems, storage & power infrastructure	0	3	3	0	0	3	
A9	Analysis tools	3	3	0	0	3	3	
A8	Development testing & validation	3	3	0	0	3	2	
S2	National security	3	0	0	2	1	2	
L1	Service & Support	3	1	0	0	3	3	
P2	Electric drive technology	1	0	3	0	0	2	
P3	Mechanical energy & storage technology	2	3	2	0	0	1	
I6	Voyage management	3	0	1	1	1	1	
C2	Offshore wind	0	3	2	0	0	3	