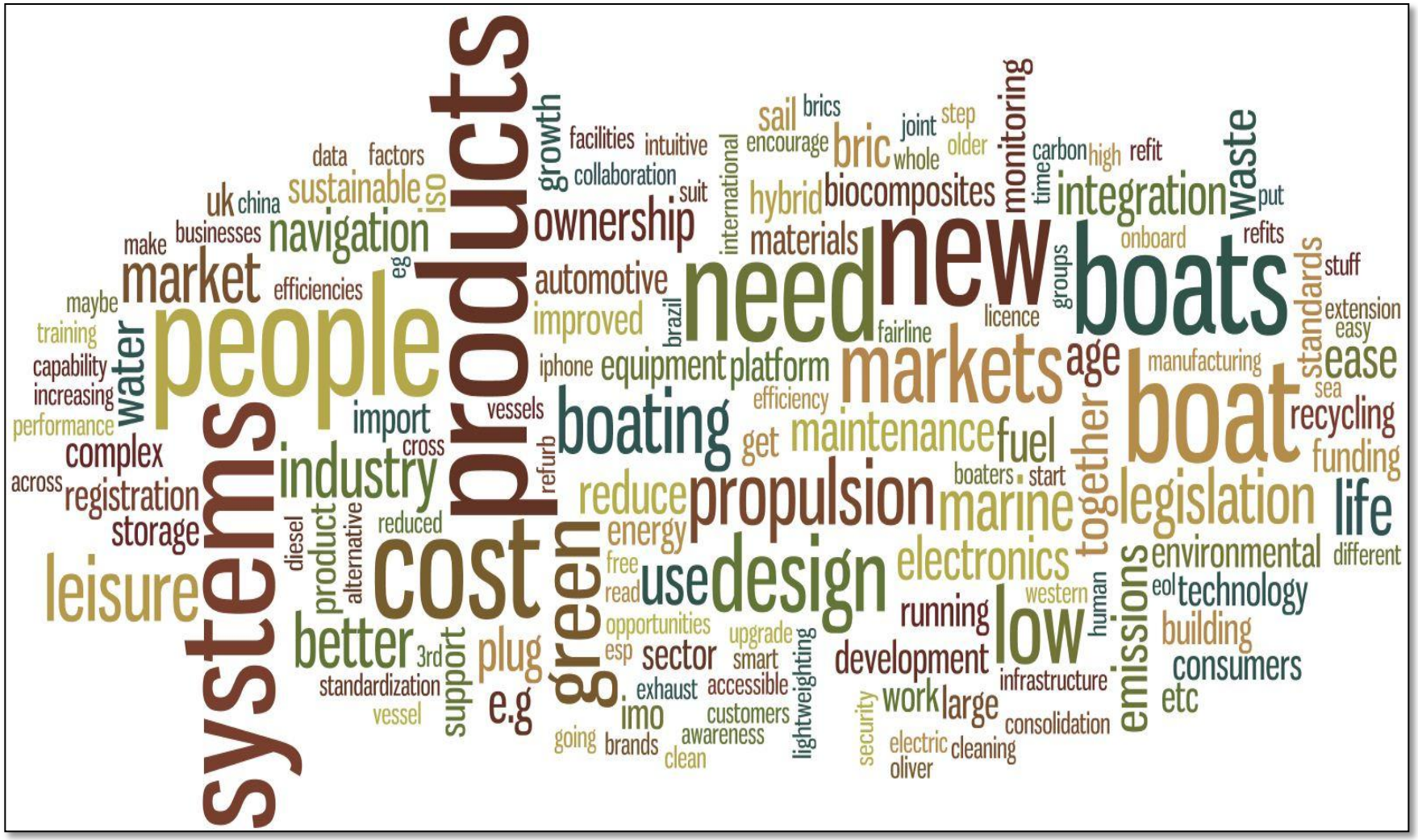
UK Marine Industries Roadmap & Capability Study

Workshop C: Marine Leisure & Equipment, 9 November



Technology Strategy Board
Driving Innovation

UK Marine Industries Alliance

Knowledge Transfer Networks

BIS Department for Business Innovation & Skills

Dominic Oughton do251@cam.ac.uk IfM

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 third of five "Deep Dive" explorations of the sector, focussing on Marine Leisure & Equipment. The workshop took place at the University of Warwick on 9 November 2011, with input from over 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 Marine Leisure and Equipment.

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 changing demographics and consumer demand (from the needs of an ageing population, challenges of introducing new people to boating and opportunities from emerging Markets / BRIC Growth) resulting in a more "clean hands - no sweat" boat operation; as well as the challenges of reversing the increasing cost of boating at a time of economic downturn. The role of standards will be significant, especially from EU and relating to technical, environmental (NOX, SOX, particulates, waste & CO2) and safety; as will new technologies including more environmentally-friendly propulsion energy solutions; simulation & modelling and Accelerated NPD processes. Through-life support will be vital in delivering lower cost of ownership, with the need to consider recycling, retrofit and upgrade, as well as end of life disposal & recycling .

Executive Summary (continued)

Priority Opportunities (see section 3) were identified across a range of areas, though largely focussed on marine leisure rather than equipment. The leading opportunities included: Easy to use leisure navigation system & integrated communications / data; Alternative fuels / Electrification & Hybrids & efficient propulsion / re-powering ;New leisure marine products for developing markets (and tailoring for specific market needs); Volume produced smaller leisure craft types for affordable participation eg for first-time owners / 3rd age; Lower-cost construction methods and Hull design, vessel design & aesthetics . Opportunities for equipment and component technologies were highlighted, including sustainable composites & smart materials; Coatings (eg for low friction); Safety systems & equipment ; Technologies for (Semi-)autonomous control & navigation (eg Intuitive IT based controls) and Exhaust after treatment systems however these were not highly prioritised as the necessary expertise were under-represented in the workshop participants.

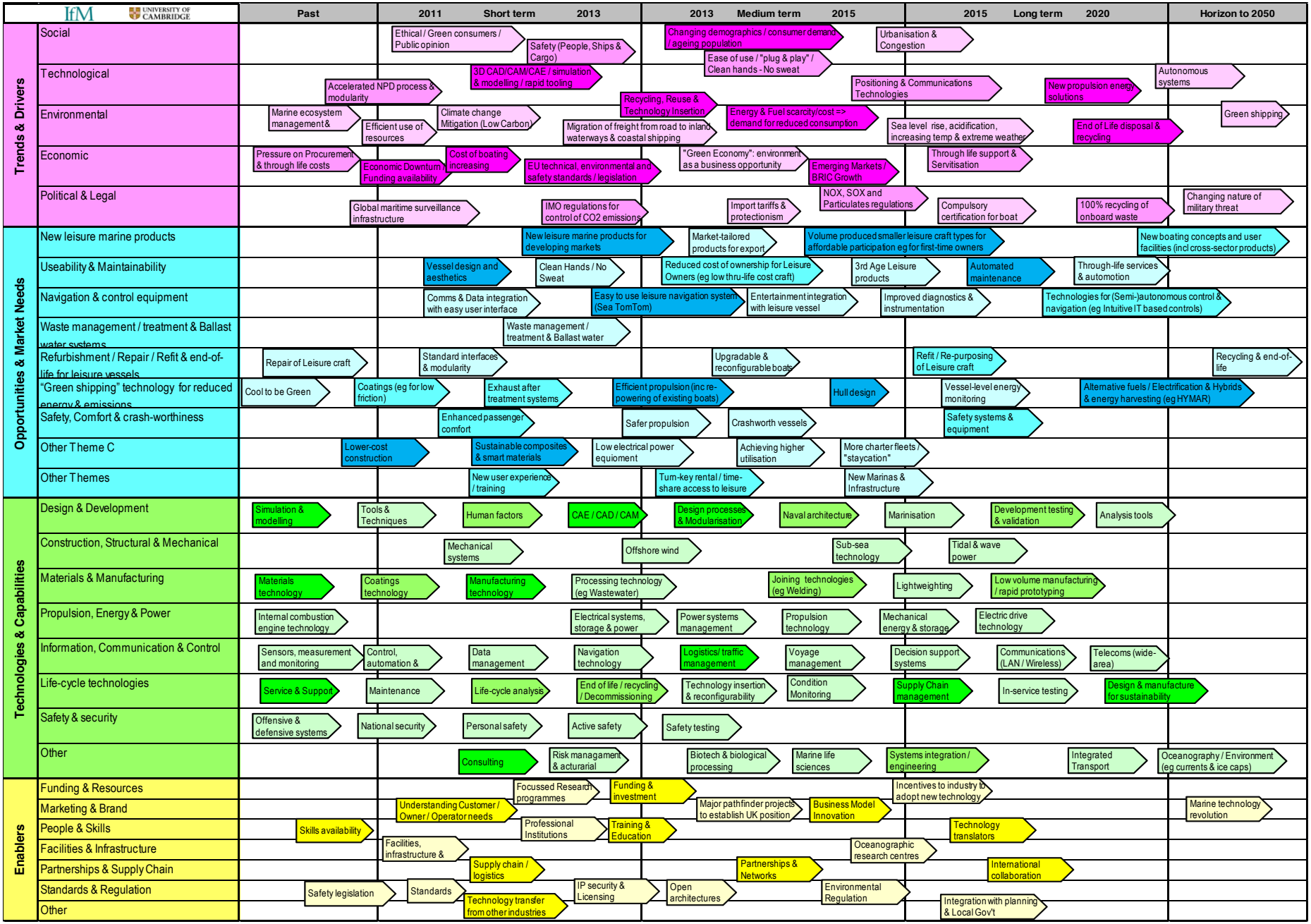
Of these opportunities, the first six were explored in more detail – to characterise the market value and identify relevant sources of UK capability for delivery (and potential gaps that will need to be filled – see section 7)

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: Supply Chain management; Service & Support; Simulation & modelling; CAE / CAD / CAM; Design processes & Modularisation; Materials technology; Manufacturing technology; Design & manufacture for sustainability.

The workshop also identified other key enablers for success, underpinning these capabilities as: Understanding Customer / Owner / Operator needs; Technology transfer from other industries; Skills availability; Training & Education; Funding & investment; Partnerships & Networks; International collaboration; Supply chain / logistics; Business Model Innovation and Technology translators.

It was particularly notable that the role of technology transfer from other areas of Marine and the wider industrial base (and supporting enablers to deliver this) was strongly prevalent in the delivery of all the priority opportunities.

1. Roadmap Landscape



2. Landscape Linkages

Trends & Drivers													Market Opportunities			Capabilities																						Enablers											
Changing demographics / consumer demand / ageing population	Emerging Markets / BRIC Growth	Energy & Fuel scarcity/cost => demand for reduced consumption	New Business Models	Cost of boating increasing	Ethical / Green consumers	Green shipping	Efficient use of resources	New propulsion energy solutions	NOX, SOX and Particulates regulations	Pressure on Procurement & through life costs	EU technical, environmental and safety standards / legislation				Supply Chain management	Service & Support	Simulation & modelling	CAE / CAD / CAM	Design processes & Modularisation	Materials technology	Manufacturing technology	Design & manufacture for sustainability	Consulting	Logistics/ traffic management	Coatings technology	Command & Control	Development testing & validation	Low volume manufacturing / rapid prototyping	Naval architecture	Human factors	End of life / recycling / Decommissioning	Joining technologies (eg Welding)	Systems integration / engineering	Life-cycle analysis	Understanding Customer / Owner / Operator needs	Technology transfer from other industries	Skills availability	Training & Education	Funding & investment	Partnerships & Networks	International collaboration	Supply chain / logistics	Business Model Innovation	Technology translators	Incentives to industry to adopt new technology	Focussed Research programmes	
1	2	3	4	5	6	7	8	9	10	11	12		**Market Opportunities**		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	1	2	3	4	5	6	7	8	9	10	11	12	
1			1			1	1					A	Easy to use Leisure Navigation System & Integrated Comms/Data	4	2	3	3	3	3	1	1	3	3	3	1		3	2		3	3	1	3	2	1	1		1			1	1	1	1	1	1	52
		1			1			1	1		1	B	Alternative fuels: Electrification, Hybrids etc	5			2	2		2	3	2	2				3	2					3			1			1			1	1	1	1	1	26
1	1	1	1	1	1	1		1	1	1	1	C	New Leisure Marine Products for Developing Markets	11	3	3			3					3	2	3									1		1	1	1	1	1	1	1		1		26
1	1	1	1	1	1		1					D	Volume/Smaller Craft (New users/3rd Age)	7	3	3	2	3		3	3	3			2		2	3	3	2	3	1		3	1	1	1	1	1	1	1	1	1				48
	1			1						1		E	Lower cost construction	3	3		3	2	2	3	3	2	3		2		2	3	2		2	2	2	2	1	1	1		1	1				1		1	45
1	1	1										F	Hull Design, Vessel Design & Aesthetics	3			3	3		3	2	2	3						3	3	1	3		1	1	1	1	1		1						33
4	4	4	3	3	3	2	2	2	2	2	2				11	9	13	13	8	12	12	12	11	6	7	3	10	10	8	8	9	7	8	8	5	5	4	4	4	4	4	3	3	3	3	3	

Dominic Oughton do251@cam.ac.uk IfM

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	Easy to use Leisure Navigation System & Integrated Comms/Data	3	1	1	2	3	4	2		4	3	3	3	3	3		
B	Alternative fuels: Electrification, Hybrids etc	1	0	1.5	1	2	1	1		1.5	3	3	3	2	1		
C	New Leisure Marine Products for Developing Markets	4	2	2	2	0	1	2		4	4	3	3	1	2		
D	Volume/Smaller Craft (New users/3rd Age)	3	1	2	2	0	1	2		3	4	4	2	2	3		
E	Lower cost construction	2	1	1.5	2	2	2	1		1	2	3	2.5	0	1		
F	Hull Design, Vessel Design & Aesthetics	1	0	2	1	1	1	0		4	4	1	4	3	3		

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

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

Red text – carousel group comments

Dominic Oughton do251@cam.ac.uk IfM

4. Capability - Ranked

Capabilities		A	B	C	D	E	F	
		Easy to use Leisure Navigation System & Integrated Comms/Data	Alternative fuels: Electrification, Hybrids etc	New Leisure Marine Products for Developing Markets	Volume/Smaller Craft (New users/3rd Age)	Lower cost construction	Hull Design, Vessel Design & Aesthetics	
Ranked capabilities (top-level grouping)								
M Total	Materials & Manufacturing							
A Total	Design & Development							
L Total	Life-cycle technologies							
I Total	Information, Communication & Control							
P Total	Propulsion, Energy & Power							
O Total	Other							
S Total	Safety & security							
C Total	Construction, Structural & Mechanical							
Ranked capabilities (detail)								
L7	Supply Chain management	2	0	**3**	**3**	**3**	0	
L1	Service & Support	**3**	0	**3**	**3**	0	0	
A1	Simulation & modelling	**3**	2	0	2	**3**	**3**	
A4	CAE / CAD / CAM	**3**	2	0	**3**	2	**3**	
A5	Design processes & Modularisation	**3**	0	**3**	0	2	0	
M1	Materials technology	1	2	0	**3**	**3**	**3**	
M3	Manufacturing technology	1	**3**	0	**3**	**3**	2	
L9	Design & manufacture for sustainability	**3**	2	0	**3**	2	2	
O3	Consulting	**3**	2	0	0	**3**	**3**	
I5	Logistics/ traffic management	**3**	0	**3**	0	0	0	
M2	Coatings technology	1	0	2	2	2	0	
M8	Command & Control	0	0	**3**	0	0	0	
A8	Development testing & validation	**3**	**3**	0	2	2	0	
M7	Low volume manufacturing / rapid prototyping	2	2	0	**3**	**3**	0	
A6	Naval architecture	0	0	0	**3**	2	**3**	
A3	Human factors	**3**	0	0	2	0	**3**	
L4	End of life / recycling / Decommissioning	**3**	0	0	**3**	2	1	
M5	Joining technologies (eg Welding)	1	0	0	1	2	3	
O7	Systems integration / engineering	**3**	**3**	0	0	2	0	
L3	Life-cycle analysis	2	0	0	**3**	2	1	

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