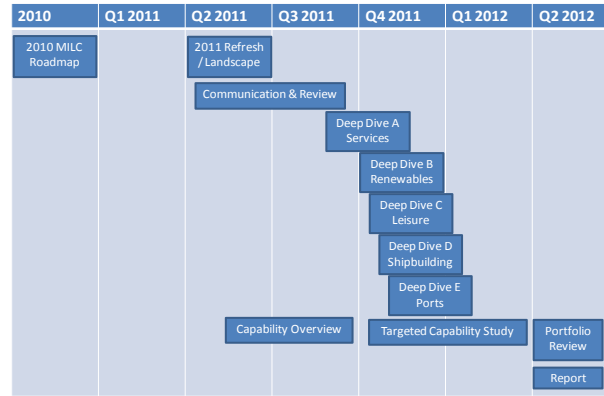
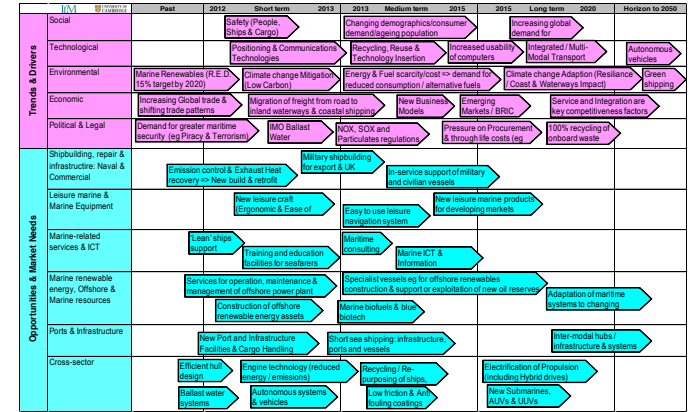


Background and Workshop process

The Marine Industries Landscape Roadmap developed in June 2011 identified 5 key themes for further “Deep Dive” explorations in focussed workshops.



Marine Industries Roadmap Programme.



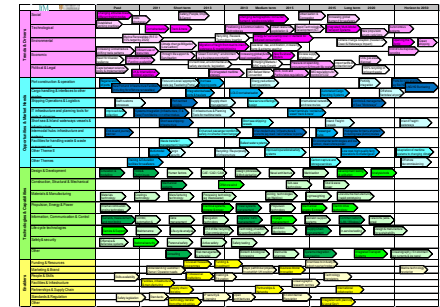
June Landscape Roadmap

Before the workshops participants prepared a one-page summary of their perspectives capturing key Drivers, Opportunities, Capabilities and Enablers:

Name:	Dominic Oughton	Organisation:	University of Cambridge
TRENDS & DRIVERS	<ul style="list-style-type: none"> Emerging naval powers 	<ul style="list-style-type: none"> Growth in short-sea shipping Energy scarcity & cost 	<ul style="list-style-type: none"> Positioning & autonomous vehicle technologies
OPPORTUNITIES	<ul style="list-style-type: none"> Rollout, production & exhaust cleaning to improve efficiency of existing vessels 	<ul style="list-style-type: none"> New vessels, including large offshore structures 	<ul style="list-style-type: none"> Autonomous systems
CAPABILITIES	<ul style="list-style-type: none"> Hybrid drive & energy storage 	<ul style="list-style-type: none"> Design for technology insertion 	<ul style="list-style-type: none"> Hybrid drive & energy storage
ENABLERS	<ul style="list-style-type: none"> Repair facilities 	<ul style="list-style-type: none"> Offset programmes for military export 	<ul style="list-style-type: none"> Technology transfer from aerospace

Example Participant pre-work.

The workshop started with a baseline Theme roadmap developed from the pre-work submitted by the participants plus the relevant items from the Landscape:



Baseline Theme Roadmap

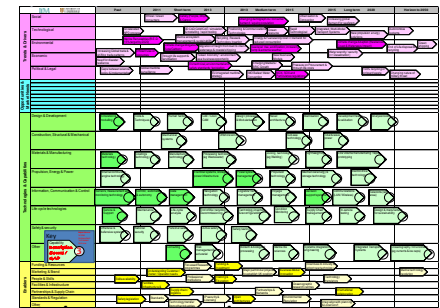
The Trends & Drivers layer was then prioritised and the most important drivers used to focus discussion to extend the baseline Market Opportunities already identified by the group.

Priority Opportunities were then explored in more detail in breakout groups using a structured template.

Opportunity	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Offshore Renewable Energy																					
Marine Renewable Energy																					
Ports & Infrastructure																					
Shipbuilding																					
Leisure																					
Marine Services																					
Marine Renewable Energy																					
Ports & Infrastructure																					
Shipbuilding																					
Leisure																					
Marine Services																					

Opportunity Breakout Template.

Finally the Drivers, Capabilities and other Enablers most relevant to each of the priority Opportunities were reviewed and these “linkages” captured



Linkages Template

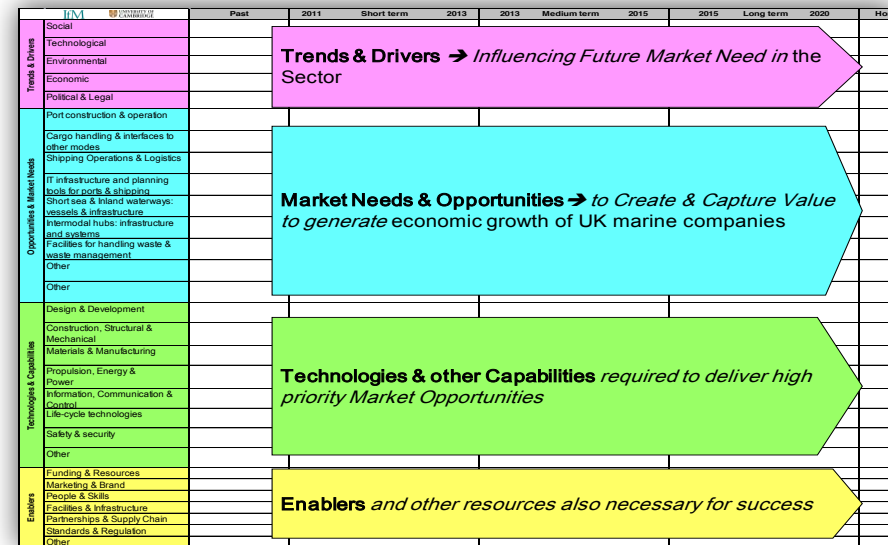
How to interpret Executive Summary reports

The title page of each report is a “wordle” picture (courtesy of www.wordle.net) which summarises the key themes from the participants – larger font representing more frequent recurrence. The next two pages then summarise the main findings of the workshop.

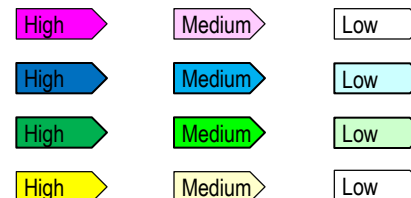
The graphic on page 4 (**1. Landscape**) represents the top-level roadmap view of the workshop outputs. A simplified version of the template is shown below. Time runs from left to right: moving from the past through short, medium and long terms to the future vision. The roadmap endeavours to help understand “Where do we want to go?”; “Where are we now?” and “How do we bridge the gap?”

The layers of the landscape represent different (linked) perspectives, broadly covering “Why”, “What” and “How”:

- The top layer represents the external Trends & Drivers (Social, Technological, Environmental, Economic and Political & Legal) that will influence the future of this sector of the Marine Industries.
- The second layer represents the Market Opportunities that have been identified for UK Marine Industries, where global market need is matched by the UK’s capability to deliver.
- The third layer captures the Capabilities (largely technology related) necessary to deliver these opportunities..
- The fourth layer covers the other Enablers (eg Skills, Resources, Infrastructure and Regulation) needed for success.



Items in each layer are colour-coded to indicate their importance – deeper colour indicating higher priority / impact:



How to interpret Executive Summary reports (continued)

The graphic on page 5 (**2. Landscape Linkages**) represents the relationships between the layers of the Landscape. The rows (blue) represent the priority Market Opportunities that were identified. The left hand columns (pink) indicate which Drivers are most likely to make these Opportunities attractive; whilst the right hand columns (green and yellow) indicate which Capabilities and Enablers will be required to deliver them.

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	Weighted Value	Marine Industry	University / Academic	RTO / Design Services	Other Industry	Other UK resources	Weighted Capability	Combined Value & Fit
		Planet / Environmental	People / Social	Profitability										
A	Systems Integration	3	2	2	3	4	3	3	2	3	4	3		
B	New port & infrastructure facilities	3	2	1	2	2	2	2	3	3	3	2		
C	Environmental Technologies	4	3	2	4	3	3	1	3	4	2	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

The graphic on page 7 (**4. Capability Ranked**) shows which capabilities will be required to deliver the priority Opportunities and ranks these according to those which have the most general applicability across all Opportunities considered (both by top-level grouping and individual capability). The bars and numbers indicate degree of impact – longer bars / higher numbers delivering more impact.

Trends & Drivers												2. Landscape Linkages												Capabilities												Enablers											
Market Opportunities												Market Opportunities												Capabilities												Enablers											
A												Systems integration												4												4											
B												New port & infrastructure facilities												7												7											
C												Environmental Technologies												7												7											
D												Hub Spoke for trans shipping												6												6											
E												Sea Motorways & SSS Infrastructure												4												4											
F												LNG/H2 Bunkering												6												6											

The graphic on page 6 (**3. Priority Market Opportunities**) summarises the characterisation of Opportunities against Criteria defined by the Steering Group (covering both the “Value” and “Capability Fit”) – see page 5 for details of the scoring

Capabilities	A	B	C	D	E	F	Total
4. Capability Ranked	Systems Integration	New port & infrastructure facilities	Environmental Technologies	Hub Spoke for trans shipping	Sea Motorways & SSS Infrastructure	LNG/H2 Bunkering	
Ranked capabilities (top-level grouping)							
I Total	Information, Communication & Control						
A Total	Design & Development						
L Total	Life-cycle technologies						
D 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	1	2
P5	Power systems management	2	3	3	2	0	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
D7	Systems integration / engineering	3	2	1	0	3	3
A2	Tools & Techniques	3	2	3	1	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

Opportunity Characterisation Criteria

Value (Portfolio Y Axis)			0	1	2	3	4
Market Attractiveness:	Global Market Growth Opportunity	Potential incremental annual sales for UK Industry into Global market in 2020	Small <£200m	Modest > £200m	Medium > £1bn	Large > £2bn	V. Large > £5bn
	Home (UK) Market Growth Opportunity	Potential incremental annual sales for UK Industry into UK market in 2020	Small < £100m	Modest > £100m	Medium > £500m	Large > £1bn	V. Large > £2bn
	Strength of competition (Global)	Strength of competition (Global)	Dominant / Entrenched	Strong / Established	Limited / Developing	Weak / Emerging	None
	Added Value in UK	Sales value less imported goods & raw materials / sales value	10%	30%	50%	70%	90%
	Cross-sector opportunity (selling into other non-marine sectors)	Potential incremental annual sales for UK Industry into Global non-Marine markets in 2020	Small < £100m	Modest > £100m	Medium > £500m	Large > £1bn	V. Large > £2bn
Triple bottom-line benefits (or dis-benefits score - ve):	Planet / Environmental	Reduction in carbon footprint, pollution and resource utilisation	None	Modest	Significant	Major	Game-Changing
	People / Societal	Safety, Public health & Wellbeing	None	Modest	Significant	Major	Game-Changing
Capability (Portfolio X Axis)			0	1	2	3	4
Fit with UK Capability	Marine Industry	Marine Industry capability	None	Moderate / Emerging / Dispersed	Strong but below critical mass	World-Leading OR significant scale	World-Leading AND significant scale
	University / Academic	University / Academic capability					
	Research & Technology Organisation / Design Services	Research & Technology Organisation / Design Services capability					
	Non-Marine transport / Other Industry	Non-Marine transport / Other Industry					
	Other UK resources / infrastructure / context	Other UK resources / infrastructure / context					
Timeliness	UK Capability matches market need	Current technology readiness (TRL scale) + Time to develop > Expected timescale and rate of market adoption	Already "missed the boat"	Lagging but could recover	On track	Pace setting	Ahead of the game