Shipping and sustainable development: Opportunities, climate challenges, and the role of stakeholder partnerships

Dr Ben Milligan, University College London Energy Institute
Unsustainable development of ocean-based economies

Conversion & depletion

Damage from human activity

Conversion or substitution without net loss

Investment in conservation, restoration & enhancement

Milligan et al, forthcoming 2016
Development of the shipping sector: opportunities

2010

1,000
5,000
25,000
190,000

Europe - Far East
Europe - Latin America
Europe - Middle East and South Asia
Far East - Latin America
Far East - Middle East and South Asia
Intra - Far East
Intra - Europe
Intra - Latin America
Intra - North America
North America - Latin America
North America - Middle East and South Asia
Trans - Atlantic
Trans - Pacific
Africa - Far East

2030 Status Quo

1,000
5,000
25,000
190,000

Europe - Far East
Europe - Latin America
Europe - Middle East and South Asia
Far East - Latin America
Far East - Middle East and South Asia
Intra - Far East
Intra - Europe
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MSI/Lloyd’s Register, 2013
Development of the shipping sector: climate-related challenges

Business as usual (3rd IMO GHG Study)

2°C pathway (upper bound)

1.5°C pathway (lower bound)
Development within carbon budgets:
The glide path scenario

Cumulative emissions
- 2 degrees ~ 1250Gt
- 1.5 degrees ~ 620Gt
Development within carbon budgets:
The delayed action scenario

Cumulative emissions
2 degrees ~ 1250Gt
1.5 degrees ~ 620Gt

~40Gt
The current public policy response:

2011 IMO – EEDI and SEEMP

2015 EU – MRV Regulation

2015 Paris Agreement – no specific provisions

2016 IMO – MEPC Working Group

Key outstanding issues: raising ambition, fair share, CBDR-RC, design of regulatory mechanisms
Key design challenges at international level

Target proportionate to ‘well below 2 and aiming for 1.5’
‘Lever’ to enable a low carbon pathways (e.g. carbon price)

System for addressing revenue deployment for:
  - GCF
  - Offsetting
    - In-sector schemes to assist transition (infrastructure, R&D, grandfathering)
  - Developing country compensation

Address barriers and failures that hinder market efficiency

MRV / fuel monitoring – for sector ‘health’ monitoring and progress review
The current private sector response:

Various standards and initiatives (CCWG, EVDI, ESI…)

Some challenges: transparency, data quality, ambition

Import part of low-carbon transition, but need strengthening
What does success look like?
Practical options and scenarios for reducing GHG emission from shipping
Absolute versus relative targets

Typical length of contract (charter)

Average economic lifespan of ships today

Max period for financing

All scenarios here are 2 degree

60–90% decrease in fleet average carbon intensity
Technology options

Emissions capture & removal – e.g. scrubbers
Energy storage – e.g. batteries, fuel cells
Low carbon fuels – e.g. LNG, biofuels
Propulsion – e.g. sails, kites, flettner rotors
Operational – e.g. speed, route

Rehmatulla et al, 2015
Financing the transition

Climate finance
Development finance
Private sector investment
Blended and staged approaches

<table>
<thead>
<tr>
<th>Type of investor</th>
<th>Return objective</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Conservation impact</td>
</tr>
<tr>
<td>Donor</td>
<td>Sole demand is to see conservation impact</td>
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<tr>
<td></td>
<td>No financial return expectations</td>
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<tr>
<td>Wealth-preserving</td>
<td>Seeks impact as primary objective while preserving wealth</td>
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<tr>
<td></td>
<td>No financial return expectations</td>
</tr>
<tr>
<td>Return-seeking</td>
<td>Objective is market-level returns while achieving superior impact</td>
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<tr>
<td></td>
<td>No trade-off envisaged</td>
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</tbody>
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WWF, McKinsey, Credit Suisse, 2014
Key ongoing intergovernmental efforts

GLOMEEP – Global Partnerships for Maritime Energy Efficiency

MTCC – Maritime Technology Cooperation
Focus of our shipping research and consultancy work

2000’s  Now  2050

Recent trends in energy efficiency

Energy efficiency futures and options for achieving them
Modelling the shipping sector – our approach

EXOGENOUS DRIVERS
- Consumption: Population, wealth
- Production: Natural resources, manufacturing
- Fuel: Price, availability
- Policy: Regulation, fiscal

Transport demand
- Freight
  - Passenger

Routes
- Port to port, other modes

Ships
- Existing, retrofit, new technologies/fuels

Shipping
- Allocation to mode: ship, train, road, air
- Shipping logistics model
- Shiploading, speed, distance
- Port model
- Ship model

Other modes
- Train, air, road

Energy, Emission, Cost

Containership

Tanker

Bulk carriers/General cargo

Crude

Product/Chemical
Collaborations and partnerships

IMO Secretariat
National shipowners associations
International associations
National governments
Professional institutions
Multinationals
Environment NGOs
Other academia
Carbon War Room
The shipping in changing climates consortium
Stakeholder partnerships: key lessons learned

Diversity and complexity of stakeholders and relationships
Stakeholder partnerships: key lessons learned

Academics as pan-stakeholders and information brokers
Academics as problem framers and facilitators of track two dialogue
Mutually supportive relationships between research and consulting
www.lowcarbonshipping.co.uk
www.ucl.ac.uk/energy
www.u-mas.co.uk

Most references on above websites. Please get in touch if you have questions.