Shipping: an innovation system in the making
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Marktnischen

South-South Handel – neue, wachsende Märkte?

Fairtrade

Nachhaltige Konsum
Coffee, Kenco Coffee (Kraft UK), Mars Inc (cocoa)
Greenbiz (2011)
Technologienischen

- Biotreibstoffe: tatsächlich nachhaltig?
- Langsam Fahren
- Wind für die Seeschifffahrt
Conditions for market-uptake in a TIS

Market-uptake occurs when cumulative causation between 7 functions works.
Market Demand

Shippers, Logistics firms, Shipyards, Engine Suppliers, Designers, Operators

Landscape

North Sea LNG reserves

Norway NOx SOx regulations

EU Baltic, US, Canada NOx SOx regulations

Niche 1

LNG carriers

Gas carriers
LNG steam turbines
LNG low speed diesels

LNG supply for industry

Niche 2 ECAs

Ferries, short sea

Nor, Baltic, USA, Canada

Ferries: Nor, Baltic
LNG med speed diesels
Dual fuel, diesel-electric

Market Demand

Nor, Baltic ferries

Norway Local Ro-Ro, Baltic, Canada, US

Environmental, Design Regulation

Market Demand
Shippers, Logistics firms

Shipyards
Engine Suppliers
Designers

Operators
Ports, fuel supply
LNG Ships 2016

- 77 Ships in operation (excluding LNG carriers)
- 44 ships with LNG-Antrieb on order in 2016
- + 35 Ships with provision for LNG ordered

Quelle: http://schiffe-emden.de/ms-ostfriesland
LNG Niche

**LNG availability**

Environmental Regulation
- EU, national Environmental policy
- NGOS, lobbies
- Investment Incentives
- Trade and development Policy
- Economic Growth

R&D
- Class (Lloyds DNV-GL)
- RINA
- SNAME
- Universities Research Institutes
- Shipyards
- Engine Suppliers
- Designers
- R&D Policy, Subsidies

Shipping companies, Charterers
- Price, delivery Time
- Ports LNG supply infrastructure
- Environmental constraints
- Finance, Lloyds

Demand
- Demand for sustainability industry consumers
- Shippers, Logistics firms

Landscape: Macroeconomics
- Trade and development Policy
- Economic Growth
- Freight rates
- Environmental constraints
- Finance, Lloyds

Class (Lloyds DNV-GL)
- RINA
- SNAME
- Universities Research Institutes
Innovation System: wind

Safety and environmental Regulation subsystem
- Regulatory authorities, EU, national Environmental policy
- Class society design standards

Landscape: Macro-economics
- NGOS, climate policies
- Trade and development Policy
- Economic Growth
- Oil prices availability

R&D Policy, Subsidies, F3, F7
- R&D F1, F2, F7
  - New /specialist shipbuilders
  - Sail/kite systems suppliers
  - Weather routing systems
  - Design/sustainable logistics consultancies

Operations, Infrastructure
- Real Time weather routing and sail control
- Low speed logistics
- Finance, Investment capital

Demand
- Cruises, Bulk and dry bulk
- Demand for sustainability industry consumers

Demand for sustainability industry consumers
- Price, delivery Time F5B
- Investment Incentives
- Environmental constraints F3
- F6

Universities Research Institutes
- F2 know gen
- F3 Guide Search
- F4 Entrep Expt
- F5A Mkt Dem
- F5B Mkt Supp
- F6 legitimation
- F7 Resource mob