Enhancement of Energy Efficiency in Ship Operations

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Agenda

Results of three year business school research project on how to enhance energy efficiency in ship operations

- Focus on performance monitoring
- Financed by Danish Maritime Fund, 2012-15
- In-depth interviews with 50+ employees and executives in shipping companies, class societies, technical consultancies and equipment/service suppliers
- All major segments and shipping company business models covered

Outline of presentation

1. Why, what and how to monitor?
2. Current monitoring problems
3. Effects of business models on energy efficiency
4. Conclusions: How to enhance energy efficiency
My audience

Shipping companies, who are struggling with high fuel bills

Message:
• No surprise: A huge potential for enhancement of energy efficiency still exists
• But business models affect performance monitoring practices and efforts to enhance energy efficiency
• You should look into business models in order to improve performance monitoring practices and achieve fuel savings

Equipment and service suppliers, who are experiencing problems convincing shipping companies to invest in energy efficiency enhancements

Message:
• No surprise: There is a market out there for performance monitoring and energy efficiency enhancement
• But you cannot sell your products and services if you do not understand the effects of shipping company business models on performance systems and energy efficiency
Why monitor performance?

- Comply with SEEMP requirements
- Reduce fuel bill
- Improve vessel speed-consumption description in order to offer right prices in freight markets
- Receive inputs for future investment decisions
- Identify and transfer best practices between crews and vessels
- Enhance transparency and awareness – at sea and ashore – to implement new KPIs on energy efficiency
- Implement vessel competitions in order to improve crews’ incentives for fuel savings
- Document environmental performance of shipping company to cargo owners
- Currently shipping company business models cause some shipping companies to disregard some of the above aspects
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Business models

Business model: Slywotzky (1996) refers to “the totality of how a company selects its customers, defines and differentiates its offerings, defines the tasks it will perform itself and those it will outsource, configures its resources, goes to market, creates utility for customers and captures profits.”

Key aspects of shipping company business models which influence monitoring practices and efforts to enhance energy efficiency:

• Key company competencies and resources: What capabilities to have and how to allocate resources?
• Make-or-buy: What to keep in-house, what to outsource?
• Time perspective for investments: For how long are assets controlled?
• Utility for customers: What services to offer customers?
What to monitor?

- Trim
- Air-conditioning
- Hotel functions
- Cargo, fuel and freshwater pumps
- Cargo heating and cooling systems
- Main and auxiliary engines
- Gen-sets
- Wind and wave conditions
- Hull and propeller condition
- And much more!
How to monitor?

Auto-logging versus manual noon-reports

Manual noon-reports are currently employed
The mandatory Ship Energy Efficiency Management Plan (SEEMP) has not caused any major changes in shipping industry performance monitoring systems.
Current monitoring problems

The fundamental problem: Performance monitoring was not relevant to shipping during the boom years when low fuel prices prevailed, before 2008.

This legacy still hampers fuel saving efforts.
Current monitoring problems

- Often crews lack sufficient training and time for performance monitoring.
- Crews often have incentives for misreporting of fuel consumption data.
- Often crews are not encouraged by shore organizations to engage in energy saving initiatives.
- Often shore organizations lack competencies for analysis of performance data.
- Often crews do not receive useful feedback from shore concerning performance.
- Shipping companies may publish unreliable performance data to gain competitive advantages in freight markets.
- Vessels on short term charters are not tailored for performance monitoring.
- Complexity: Responsibilities are delegated between several actors.
Effects of business models

Performance monitoring requires new competencies

- Planning, monitoring, analysis and evaluation of performance requires new competencies and additional resources
- Availability of such competencies depends on shipping company business models
- Many organizations lack such competencies
  - At sea:
    - A gap between the actual and ideal level of crew training
    - Often simple vessels and cheap crews are preferred to more sophisticated systems aimed at fuel savings
    - Education and training takes time
  - Ashore:
    - Shore organizations lacking competencies and resources for proper performance data analysis
    - Problems with feedback from shore to vessels caused by competency problems ashore
Effects of business models

Outsourcing of ship-management challenges shipping companies’ efforts to save fuel

- Difficult to retain fuel-saving know-how
- Difficult to foster bottom-up initiatives for fuel savings
- Difficult to set-up KPIs for crews employed by third parties
- Difficult to influence crew training for crews employed by third parties
- Fuel savings are not impossible for such business models, but careful planning and detailed contracts are required to achieve fuel savings

Size of organizations influences performance systems

- Small shipping companies lack bargaining power vis-à-vis tonnage providers and crew managers and cannot demand detailed performance systems
- Large shipping companies have greater bargaining power and can more easily put pressure on tonnage providers and third party ship managers – and they do
Effects of business models

Time perspectives for investments influence performance systems

- In short term chartering contracts other imperatives than fuel savings are prioritized
- Short term charters and asset play strategies do currently not allow for investments with short pay-back periods, because such investments are rarely remunerated in the spot and second-hand markets
- Difficult to retain know-how when different vessels are chartered all the time
- Difficult to support bottom-up initiatives for fuel savings due to short-term relationship between charterer and tonnage provider

Size of organizations influences performance systems

- Again size matters: Large shipping companies can pose stronger demands to tonnage providers
Effects of business models

Services offered to cargo owners

• Today environmental performance is rarely part of shipping company business models
• Could environmental performance become part of future business models?
• Will the environmental effects of shipping turn into a problem for shippers in the future?
• Will cargo owners start to ask shipping companies for data on emissions?
• More efficient performance measurement systems are crucial for shipping companies to deliver transparent and reliable emission data to cargo owners in the future
Conclusion

• A huge potential for enhancement of energy efficiency still exists
• Business models affect performance monitoring practices and thus efforts to save fuel
  • Key company competencies and resources: New capabilities are required to achieve efficient monitoring and fuel saving
  • Make-or-buy decisions influence fuel consumption
  • Time perspective for investments affect fuel consumption
  • Utility for customers: Outside pressure for transparency on maritime emissions will force implementation of better performance monitoring
• Business models hold the key to improve performance monitoring practices and enhanced energy efficiency