Understanding the social and human dimension of energy management in shipping

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Introduction

- A case-study research (PhD) project about different aspects of the human and social dimension in maritime energy efficiency
- The success of most organizational and regulatory efforts to increase the energy efficiency in shipping depends on the ship crews and their capabilities of developing new practices and knowledge.
- “development of crew understanding, motivation, cooperation, and participation” was ranked as having the highest potential and “to be the most important single ingredient of a successful fuel savings program.” (Bertram et al. 1983).
- “human awareness, involvement and education are main success factors for a well-functioning work on improving energy efficiency.” (IMO, 2016).
Challenges with energy management in the shipping industry

- The DVV-GL energy management study from 2014 and 2015 showed that many shipping companies only realize savings between 1 % and 3 % and that few reach their defined saving targets (Kühnbaum, 2014; Hübner, 2015).
- Many shipping companies struggle with organizational and behavioral change issues and experience difficulties in involving and motivating the crew to save energy.
- “the lack of staff education/expertise in applying new technologies”
- “suffering from change resistance and alignment issues on their way to more efficient operations”
Few studies about the human element

- Human and social issues related to energy efficient shipping have not been sufficiently studied before. More detailed and in depth analyses of the skills, knowledge, awareness and motivation required for energy efficient ship operation is still needed.

- Kitada and Ölçer (2015) address three issues that need to be further investigated; (i) the challenges of organizational change, (ii) the adoption of new practices by the crew and (iii) the skills and knowledge of the crew members.
Energy management
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<th>SEEMP</th>
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- **Green**: Required
- **Red**: Missing
- **Dotted**: Mentioned
- **N/A**: Not applicable

Johnson et al. (2013)
Explore and analyze on board practices of energy management

Explore the knowledge, skills, awareness and motivation required for energy efficient ship operation
Methodology: one case says more than thousand surveys

“What is missing is an appreciation of the social contexts of energy saving action and of the socially situated character of technical knowledge” (Shove, 1998).

“Engineers, and other persons involved in technology use and adoption, act in a social context of social structures, regulations and norms… Experiences, routines, and habits established and negotiated in a particular network will then determine what energy efficiency measures will be implemented.” (Palm and Thollander, 2010, p. 3257).
Data collection

Observations and interviews onboard five RoPax vessels

- Approximately 195 h of observation
- Semi-structured interviews with 40 individuals (Masters, officers, chief engineers, managers)
- Documents (SEEMP, SMS, cargo lists, e-mails, reports, checklists)
Energy efficient ship operation was dependent on:

- Crew members ship- and route specific knowledge
- Collaborative learning over time
- Local culture of “we want to save energy”
- Co-operation between departments
- Adequate decision support tools
- The autonomy of officers and engineers
- Company showing appreciation of the crew members professionalism and competence (positive feedback)
- Involving the crew in all efforts to implement new technology or practices
- Personal communication between shore and ship: building trust and relation
Conclusion

- Energy management (and thus energy efficiency) is dependent on social and human factors that need to be addressed by building local engagement.

- Having an energy management system is just the first step! The rest is about making people care and learn!
Thank you for listening!

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