

CALL FOR ABSTRACTS

Energy Efficiency in Shipping and Ports

Proposal preparation for a Volume in Research and Transportation Business and Management (RTBM) published by Elsevier.

Volume Editors:

Michele Acciaro
Dept. of Logistics
The Kühne Logistics University (KLU)

Gordon Wilmsmeier
Economic Commission for Latin
America and the Caribbean
(ECLAC/CEPAL)

Introduction

Shipping and ports are key elements in maritime logistics chains. But only in recent years the discussion on energy efficiency has reached the two industries. On one side the shipping industry has traditionally been characterised by high levels of energy efficiency on the other energy efficiency and consumption was not recognised as a relevant topic for ports during the last decades of sustained growth of throughput and expansion. However, in the current environment of economic challenges, a changing geography and structure of trade and greater awareness and demand for sustainable logistics the topic of energy efficiency has come to the forefront of academic and industry discussion.

Fuel consumption accounts for over half of total ship operational costs, and ship operators and owners are making efforts to maximise the potential of every tonne of fuel burned. Notwithstanding this efficiency, the sector is constantly under pressure to find new and better ways to optimise its operation, especially as a result of increasing fuel prices. Environmental pressure has in addition increased attention on shipping fuel efficiency as the sector accounts for roughly 3% of global CO₂ emissions, a percentage that is likely to increase two or threefold by 2050 if no action is taken, as freight volumes increase and as other sectors reduce their carbon footprints (Buhaug *et al.* 2008). Additionally, the structure of container trades has changed significantly over the last years (e.g. Vagle 2013a, 2013b), requiring the industry to provide a much greater number of reefer slots as the volume of refrigerated cargoes particularly in South-South trades increased substantially.

High fuel costs, however, stricter emission regulation, and the introduction of Emission Control Areas (ECAs), have stimulated the search for ways to improve the energy efficiency in the sector and have resulted in the development within the International Maritime Organisation (IMO) of the Energy Efficiency Design Index that should allow for improvements in the sector's energy performance over time. Several proposals were discussed within the IMO Maritime and Environmental Protection Committee (MEPC) related to the so-called *Market-Based Measures* (MBM), but the debate on these measures seems to have come to a standstill.

The sector has nonetheless taken voluntary steps, with some major players having made large investments in energy efficiency technologies. And although new technologies uptakes are slow in shipping (Acciaro, Hoffmann & Eide, 2013), research on alternative sources of power, such as liquefied natural gas (LNG) or fuels cells is well underway, and

operational measures such as *slow steaming*, i.e. the practice of sailing at slower speeds, have become somehow common practice in the industry (Cariou, 2011).

Many port authorities have rapidly responded to the new technological demands of the shipping sector, and studies are being carried out in major ports to test the feasibility of LNG terminals, biofuels or onshore power supply (OPS), among other solutions. The challenge of energy efficiency has been taken up by port authorities, as many of them are increasingly concerned with their emission profiles, and regulation in port areas have become more stringent, mostly in relation to sulphur and nitrogen oxides (Acciaro *et al.* 2013; Acciaro, 2014), but in the future also with respect to particulate matters (PM) and CO₂. Energy consumption is also important in port operation and port related activities, and with energy costs increasing also on land, port authorities and terminals are looking for ways to reduce their fuel bills. Thus, differentiated infrastructure charges based on incentives to promote energy efficiency and more environmental performance could be a future strategy (Wilmsmeier, 2012)

Terminals around the world are working to change their dependency on fossil fuel to electricity. These efforts are accompanied by the development of renewable energy sources within the port perimeter (Acciaro, Ghiara & Cusano, 2013). However, many port authorities and terminal operators still lack awareness of the relevance of energy consumption and efficiency in their infrastructures and many times sound strategies to measure energy consumption and to implement energy efficiency indicators are absent (Wilmsmeier *et al.* 2014). Energy management places the port in the middle of a complex web of energy flows, and requires the port authority at least to be aware of how energy is used in the port and where it is coming from (Acciaro, 2013). It can be argued that a coordinated approach can result in energy costs savings, and even be a new source of business for the port (Acciaro, Ghiara & Cusano, 2013).

Surface transport has been in the forefront of improving its energy efficiency profile, and it is estimated that freight transport accounts for approximately 8% of energy related global CO₂ emissions (Kahn Ribeiro & Kobayashi, 2007). Triggered by climate change actions, regulation and the constant search for improving the efficiency of operations, transport service providers and logistics managers are increasingly becoming more aware of the savings achievable through energy management. This is not surprising, since in the road transport sector, for example, the amount of energy consumed for moving freight is increasing at a faster rate than the energy used by private cars and buses (McKinnon, 2010).

It is often argued in favour of modal shifts towards maritime transport or rail transport, as these are typically less energy intense modes (European Commission, 2001). Although this is generally true at least for bulk commodities, in the case of containerised or ro-ro cargo, reducing inefficiencies along the entire global chain might be more complex. Maritime transport, for example, not always results as the most environmentally friendly option, especially in the case of Ro-Ro shipping (Hjelle, 2011). In other cases, slow steaming might shift volumes back on land-based modes, reducing the overall chain energy efficiency (Psaraftis & Kontovas, 2010).

Volume Aim and Scope

The proposed volume aims at addressing the recent developments in the area of energy efficiency and energy management in the shipping and port industry, with particular attention to:

- the development and implementation of new energy efficiency technologies,
- the development and use of alternative fuels

- shipping operation and management practices aiming and improving energy efficiency
- the development of policies, regulation and the effect of incentives aiming at stimulating energy efficiency in shipping, at ports and in terminals
- the effects of structural change in international maritime trade (esp. reefer)
- the use of renewable energy sources in ports and terminals
- corporate environmental responsibility in shipping and ports, with a focus on energy efficiency
- energy management in shipping, ports and terminals
- interaction with other modes (e.g. modal shift)

Deadlines and proposed publication schedule

While the actual publication schedule depends on the decision of the Journal Editors, RTBM requires, before accepting a volume proposal, to have between 10 and 20 committed abstracts. Authors commit to make every reasonable effort to submit the paper. Final paper publication decision is the responsibility of the volume Editors, and every reasonable effort is made by the Editors to facilitate the successful publication of the volume. Since RTBM published thematic volumes, publication is generally according to schedule.

At this stage we are collecting abstract submissions for the proposed volume. Abstracts should be sent by email by **March 15th 2014** to one of the two proposed volume editors for consideration. Paper submission is expected by the **30th of December 2014**, with papers returned to the authors for revision by the end of March. After implementation of eventual revisions, publication is planned for the second half of 2015, if the volume proposal is accepted by the Journal Editors. Decision will be communicated to contributors as soon as possible with the final publication schedule.

Proposed volume editors contact details:

Michele Acciaro
The Kühne Logistics University (KLU)
Michele.Acciaro@the-KLU.org

Gordon Wilmsmeier
ECLAC/CEPAL
Gordon.Wilmsmeier@cepal.org

Bibliographical References

Acciaro, M. (2014). 'A Real Option Application to Investment in Low Sulphur Maritime Transport', *International Journal of Shipping and Transport Logistics*, 6(2), 189-211.

Acciaro, M. (2013). 'Fully sustainable energy management: The port as an energy hub', presentation at Managing Environmental Performance for Ports and Terminals, 29-30 January 2013, London.

Acciaro, M., Ferrari, C., Giuliano, G., Kapros, S., Lam, J.S., Romotsos, A., Sys, C. and Vanelslender, T. (2013). 'Innovative green ports: a framework for the success of innovation in ports in the area of sustainability', the International Association of Maritime Economics (IAME) annual conference, 3-5 July 2013, Marseille.

Acciaro, M., Ghiara, H. & Cusano, I. (2013). 'The Role of Ports as Energy Managers', the International Association of Maritime Economics (IAME) annual conference, 3-5 July 2013, Marseille.

Acciaro, M., Hoffmann, P. and Eide, M.S. (2013). 'The Energy Efficiency gap in Maritime Transport', *International Journal of Shipping and Ocean Engineering*, 3(10), 1-10.

- Buhaug, Ø., Corbett, J., Endresen, Ø., Eyring, V., Faber, J., Hanayama, S., Lee, D., Lindstad, H., Mjelde, A., Palsson, C., Wanquing, W., Winebrake, W., & Yoshida, K. (2009). *Second IMO Greenhouse Gas Study*, International Maritime Organization, London (2009).
- Cariou, P. (2011). 'Is slow steaming a sustainable means of reducing CO₂ emissions from container shipping?' *Transportation Research Part D: Transport and Environment*, 16(3), 260-264.
- European Commission (2001). *White Paper European Transport Policy for 2010: time to decide*, (COM(2001) 370 final).
- Hjelle, H. M. (2011). 'The double load factor problem of Ro-Ro shipping'. *Maritime Policy & Management*, 38(3), 235-249.
- Kahn Ribeiro, S & Kobayashi, S. (2007). 'Transport and Infrastructure', in *Furth Assessment Report: Climate change 2007 – Mitigation of climate change*, Intergovernmental Panel on Climate Change, Geneva.
- McKinnon, A. (2010). *Green logistics: Improving the environmental sustainability of logistics*, Kogan Page, 2010.
- Psaraftis, H. N., & Kontovas, C. A. (2010). 'Balancing the economic and environmental performance of maritime transportation'. *Transportation Research Part D: Transport and Environment*, 15(8), 458-462.
- Vagle, R.O. (2013a). Reefer trade in South America and the growing importance of energy efficiency. Conference proceedings at International Association of Maritime Economists Conference (IAME), Marseille 2013
- Vagle, R.O. (2013b). Maritime reefer trade in South America: a comparison of the west and east coasts. Bulletin Fal. No. 320 - 4/2013. <http://www.eclac.cl/Transporte/noticias/bolfall/3/50293/FAL-320-WEB-ENG.pdf>.
- Wilmsmeier, G., Froese, J., Zotz, A. & Meyer, A. (2014). Energy Consumption and Efficiency - Emerging Challenges from Reefer Trade in South American Container Terminals. Working Paper DRNI, ECLAC, Santiago, Chile.
- Wilmsmeier, G. (2012). Infrastructure charges: Creating incentives to improve environmental performance. Bulletin Fal. No. 309 - 5/2012. <http://www.eclac.cl/Transporte/noticias/bolfall/8/48068/FAL-309-WEB-ENG.pdf>.