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The relationship between EU's public procurement policies and energy efficiency of ferries in the EU

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ABSTRACT

The European ferry sector is the largest ferry sector globally and one of the key environmental issues facing the sector is the mitigation of greenhouse gas emissions. This paper provides an analysis of how the EU ferry procurement policies lead to lack of implementation of energy efficiency measures, contrary to the EU's key objective of reducing CO_2 emissions in ferries within the EU region. This paper is the first analysis to examine the public–private sector interaction in transport and how this leads to a lack of implementation of energy efficiency measures. Analysing the sector using agency theory suggests that split incentives are pervasive and can stymie attempts to improve the energy efficiency of ferry services in the procurement of ferries. The findings suggest that there is a need to review current ferry procurement policies with a view to devising procurement policies that can address the split incentives, as well as other policies, that are outside the scope of procurement policies, which can be used to minimise the split incentives.

1. Introduction

Ferries play an important role in the transportation of people and goods. Globally, it is estimated that over two billion passengers, 252 million cars, 677,000 buses and 32 million trailers were carried in around eight million trips in 2009 [1]. It is difficult to define the ferry market as it comprises various overlapping segments that can be classed by the travel motive and the cargo mix [1]. The European region is one of the most ferry intensive markets, accounting for 35% of global passenger traffic volume and between 60% and 80% of global vehicular traffic volumes, concentrated around Northern Europe, the Baltic and the Mediterranean regions, with Greece being one of the largest ferry nations [1].

There are several environmental issues that the industry is currently facing. These issues are both local and global, ranging from air pollution to noise pollution and from human safety to marine biodiversity. However, one of the most pressing issues for the industry are GHG emissions and their mitigation as well as recently introduced sulphur regulations, requiring a holistic approach to tackle air emissions [2]. The RoPax and pax-only[1] fleet represented just under 3% (28 million tonnes) of the CO_2 emissions from shipping in 2012 [3]. To that effect, the International Maritime Organisation (IMO), the EU and the Member States have agreed to various policy measures to curb growing emissions from shipping, which will also include some of the EU ferry fleet.

The IMO through amendments to the International Convention for the Prevention of Pollution from Ships (MARPOL) made mandatory the Energy Efficiency Design Index (EEDI) and Ship Energy Efficiency Management Plan (SEEMP), which entered into force in January 2013. The EEDI sets mandatory reduction targets, measured in grams of CO_2 per transport work done (cargo carried and distance), when the ship is built, which get tightened every five years up until 2030. For ferries the EEDI required sector specific considerations and the EEDI for ferries will take effect from 2016 with the same reduction targets i.e. 30% by 2030. The EU has key policy and strategy documents in the form of white papers and sector strategic communications and newly proposed legislation on the subject of GHG emissions namely; 2009–2018 maritime transport strategy [4], Single EU transport policy roadmap [5], EU integrated maritime policy/strategy [6], a Monitoring Reporting and Verification Regulation [7], an EU ship recycling Regulation [8], as well as policies to integrate maritime transport emissions in EU GHG reduction policies [9]. The UK, through its Climate Change Act 2008, has agreed to an 80% reduction of CO_2 emissions below 1990 levels by 2050 and it is expected that shipping (including the ferry sector) will be part of the budgeting framework to deliver the 2050 target. Similarly, the Scottish Government climate change policy aims to reduce GHG emissions, including a 50% reduction by 2030 and 80% reduction by 2050.

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[1] RoPax is a vessel that carries cars as well as passengers, Pax-only carries passengers only.

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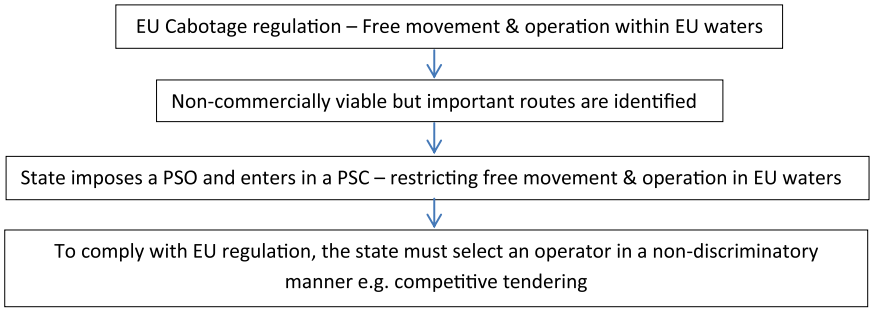

Fig. 1. EU regulations and actions of governments in procurement of ferry services requiring public intervention.

Several methods have been identified for improving energy efficiency, thereby reducing GHGs and mitigating the effects of climate change. Generally these options have been classed as either technical or operational fuel saving measures.[2] It is suggested that fuel costs in shipping generally account for 50% of a ships operating costs, a share which is set to increase as fuel costs increase, generating an even greater incentive for the implementation of energy saving measures. As a generalisation across all types of ship, the potential for saving energy and emissions using known technology and practices is thought to be significant and in the range of 25–75% [10]. More than 50 measures have been identified that could result in efficiency gains and they are generally grouped as technical measures (some applicable to new and some to existing ships i.e. retrofits) and operational measures.

Newer more efficient ferries could make a significant contribution to the environmental objective, by reducing CO_2 emissions through energy-efficient hull design, energy efficient engines, lower-friction hull coatings, propulsion upgrades e.g. wing thrusters, pulling thrusters and greater use of low carbon fuels (e.g. bio-diesel and liquid natural gas). Existing ferries could also make a significant contribution to the reduction of CO_2 through changes in operational practices, use of weather routing, autopilot adjustments, advanced hull coatings and through retrofitting measures applicable to ferries such as interceptor trim plates, propeller–rudder combinations and advanced on-board power management (e.g. energy efficient lighting).

Analysis of the literature (presented in Section 2.1) shows that some publicly procured vessels do not operate efficiently i.e. do not minimise costs such as labour and fuel and generally attract older ferries of lower quality. This paper attempts to investigate how the EU ferry procurement policies and the resultant public service obligations and contracts fail to address these problems and may also be exacerbating these problems. To that end, the paper uses agency theory to ascertain the extent to which procurement policies and public service obligations affect the implementation of the aforementioned measures that have the potential to reduce CO_2 emissions and meet various emissions objectives. Section 2 provides a brief overview of the key procurement policies within the EU and the problems that have been suggested in the public procurement of ferries. Section 3 outlines the methods and theories used in this paper. Section 4 presents the main findings. Section 5 concludes and provides possible solutions to address the problems and directions for future research.

2. Review of the European ferry sector procurement policies

This section discusses some of the fundamentals of the EU ferry procurement policies that are thought to give rise to the issues relating to energy efficiency of ferries in the EU region. Economic theory suggests that given certain assumptions (e.g. free entry and exit, known prices) competitive markets will cause efficient resource allocation [11]. When any one of these assumptions is violated, market failures will result and there would be a need for public sector intervention [12]. The ferry market is an example. Ferry markets are not always perfectly competitive making them economically unviable and resulting in a lack of service provision, for example in the lifeline ferry services which operate in the isolated communities in Scotland.

An EU Member State can impose a Public Service Obligation (PSO) in order to ensure an adequate regular ferry service to and from a given location as per Article 4 of Council Regulation (EEC) no. 3577/92, where operators in considering their own commercial interests would not provide an adequate level of service or under the same conditions [13]. A PSO would include the ports to be served, regularity, continuity, frequency and capacity, rates to be charged and manning of vessels. PSOs can be imposed through Public Service Contracts (PSC) with individual operators on a given route or through a licensing system for all operators on a given route [14]. The PSO and the PSC therefore are the basis on which compensation for operation in economically unviable[3] route is to be given.

The procurement of ferry services within the EU needs to be compatible with national and EU law. EU Council Regulation no. 3577/92 (the Cabotage regulation) regulates the transportation of passengers and goods by sea between two points within Member States of the EU. The essence of the regulation is to allow free movement of services and enable operators to operate freely within the European market. Recognising the needs for transport of passengers and goods of certain islands, exceptions to the free movement are allowed, giving Member States power to intervene by imposing PSOs and providing compensation to operators through PSCs. The Cabotage regulation requires that, for both imposing PSOs and concluding PSCs, the Member State shall do so on a non-discriminatory basis in respect of all Community (EU) shipowners[4] (operators) and therefore any compensation must be available to all Community (EU) ship owners. The interaction of EU regulations and the actions of national bodies is outlined in Fig. 1. Operators are entitled to apply for compensation in exchange for accepting PSOs and since prices are insufficient to make the services economically viable, ferry companies receive government subsidies. Careful consideration needs to be given to subsidies as they can fall foul of EU restrictions on state aid, thus the process of

[2] 1 tonne of Heavy Fuel Oil (HFO), most commonly used fuel on board ships, is equivalent to 3.14 tonnes of CO_2.

[3] This is identified if no operator asks for operating permission on a specific route.

[4] Defined as (a) nationals of a Member State established in a Member State and pursuing shipping activities; (b) shipping companies of a Member State and whose principal place of business is situated, and effective control exercised, in a Member State; or (c) nationals/shipping companies of Member State established outside the community and controlled by nationals of a Member State, if their ships are registered in and fly the flag of a Member State.

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