

IMPROVING FUEL EFFICIENCY IN THE UK FISHING FLEET

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ABSTRACT

The financial performance of the UK fishing fleet has been directly affected by high prices for diesel fuel. As a result, the fishing industry has been faced with an urgent need to reduce their dependency on fuel oil.

The UK Sea Fish Industry Authority (Seafish) is leading a project part-funded by UK fisheries departments to identify possibilities and routes to lower fuel usage. The study is seen by the industry as part of an explicit commitment to adapting the UK fishing fleet and its operations to the new era of relatively high fuel prices. The aims of this research are to identify current fuel efficiency practices and the potential scope/benefits of further uptake so vessel owners and government can take action to further improve fuel efficiency among UK fishing vessels. This work is seen as an initial and relatively quick study which may be supplemented later by more detailed work on specific fleet sectors.

The study focuses on the UK fishing fleet, taking into account different fleet sectors, fleet operations, gear types and fishing patterns. The study will assess current fuel reduction measures, the degree of uptake and barriers to uptake. The wider economic and environmental impacts of current and potential practice / uptake will be assessed as well as the impact of legislation / regulation on fuel inefficiencies.

It is hoped that this research will help industry (vessel owners) to take steps to improve fuel efficiency and make better informed decisions. The findings should inform government about the scope (or otherwise) to reduce fuel dependency (fuel use per tonne of fish landed). Policies / regulations which could be adjusted to account for impact on potential vessel business efficiency will also be highlighted.

The paper will outline the preliminary findings from this research.

INTRODUCTION

The economic performance of many sectors of the EU fishing fleet have been depressed in recent years due to restrictive management policies, low quotas and now the rapid rise in fuel costsⁱ. The UK is no exception. There is a continuing upward trend in marine fuel prices (red diesel) and most fuel analysts indicate the present price trend within the UK will continue on its current course for the foreseeable futureⁱⁱ.

The UK fishing fleet consumes approximately 300 million litres of fuel each yearⁱⁱⁱ. At current price levels, fuel costs the fleet approximately £100 million per annum³. Some sectors of the fleet have a higher dependency on fuel (beam trawlers) than others (inshore potters/creelers)³. Presently, fuel costs range between 22% (small boats, inshore fisheries) and 60% (beam trawlers) of total vessel earnings^{iv}. Fleet viability has been rescued to some extent by increased fish prices at the quayside. However, the price of fuel is still a major issue for the industry and there is an expectation that if the situation does not improve (either via lower prices or government intervention) then many vessel businesses will be forced to cease trading. This raises the question of what fishermen can do to improve their own fuel efficiency^v.

Seafish has made an explicit commitment to help the UK fishing fleet adapt to the new era of relatively high fuel prices. This paper will:

1. illustrate the preliminary findings of a research project Seafish is conducting which examines possibilities and routes to more efficient fuel usage and;

2. suggest possible ways forward for both the fishing industry and fisheries administrations.

“OPTIONS FOR IMPROVING FUEL EFFICIENCY”: RESEARCH AIMS

Seafish is leading a project part-funded by UK fisheries departments (through FIFG funding) to identify methods and routes to more efficient fuel usage.

The aims of the research are to:

1. identify current practices aimed at improving fuel efficiency, and;
2. identify potential scope and benefits of further uptake of fuel efficiency measures, so vessel owners and government can take action to further improve fuel efficiency among UK fishing vessels.

This work is an initial study which may be supplemented later by more detailed work on particular fleet sectors or efficiency measures.

The study focuses on key segments of the UK fishing fleet, and covers fleet operations, gear types and fishing patterns. It includes an assessment of some of the current fuel efficiency measures, the degree of uptake and barriers to uptake of these measures. The main segments included are the beam trawl, scallop dredge, whitefish trawl and nephrops trawl segments. Other fleet segments including lines and nets, creeling, purse seine and pelagic trawl are also included.

METHODOLOGY

Seafish staff and Jubilee Fishing Company of Grimsby conducted the research. The study research methods involved a combination of desk research and fieldwork.

Fuel efficiency was defined for the purposes of the research as fuel cost as a percentage of fish sales revenue. Therefore, improving fuel efficiency can include, using less fuel for the same catch volume or higher catch volume for the same fuel use.

A list of methods thought to improve fuel efficiency was developed from the research teams knowledge and consultation with industry representatives.

A questionnaire was designed and members of the fishing industry were interviewed either by telephone or in person. Interviewees were asked to comment on a range of questions including:

- potential methods to reduce fuel efficiency
- extent of current uptake
- scope for further uptake
- current fuel purchasing practices; and
- expected impact on the environment and effects on local economies of any changes in landing patterns that might result from widespread uptake of fuel efficient catching methods.

The survey data was analysed and individual case studies were compiled where fishing vessel businesses have successfully implemented fuel efficient measures.

Given the small sample size, industry experts from each of the fleet sectors were asked to validate the data. This ensured the survey findings could be realistically projected across the entire UK fleet.

SAMPLE

Table I and II provide a description of the interviewees in the survey sample.

Over 100 members of the fishing industry were contacted. 68 questionnaires were completed and 45 skippers chose not to complete the questionnaire as they had made no changes or did not wish to participate. A further 64 skippers completed fuel efficiency questions as part of another survey and their answers were included in the analysis.

Table I Interview sample sizes by fleet segment

Fleet segment	Sample	Population	Sample %
Beam trawl	8	96	8
Whitefish trawl	15	360*	4
Seine	4	50*	8
Nephrops trawl	44	400*	11
Scallop dredge	5	154	3
Lines and Nets	3	114	3
Creeling / Potting	34	253*	13
Pelagic	1	23	4

* = approximate figures^{vi}

Table II Other industry representatives included in sample

Other industry representatives	Sample
Vessel Agents	3
Fishermen's Associations	4
Producer Organisations	4
Technical (net makers etc)	6

PRELIMINARY RESEARCH FINDINGS

Changing attitudes towards fuel use

Over the past 18 months or so UK fishing vessel owners have changed their attitudes towards fuel oil. Previously fuel was generally viewed as a significant expense, but one which the skipper or owner had little control over and therefore accepted without too much thought. Following the steady price increase the economics of fishing have changed as have the attitudes of fishermen. The current price of fuel has brought the issue to the front of most fishermen's minds and consequently it was a subject most interviewees had no problem discussing. However, in some cases individuals had made significant positive changes to their practices and were reluctant to share this information for fear of losing their competitive advantage.

Most vessel owners surveyed reported making at least some small changes to their fishing methods and practices in an effort to reduce fuel use (per tonne landed). However, many did not think anything could be done to improve the fuel efficiency of their vessels. The preliminary findings focus on those who have made changes.

Changes made were both operational and strategic. Some changes have required little or no cost to the vessel business (for example, reducing vessel steaming speed), while other changes have required significant investment (for example, gear modifications and engine replacement). Given the scarcity of capital, this distinction between changes that have required investment and those requiring little investment to the vessel owner is important.

The most common operational changes reported were:

- changing towing patterns to minimise fuel use
- not going to sea in bad weather
- modifying gear to reduce fuel use, including: switching from single to pair trawling, reducing length of trawls, size of the trawl and changing the size and type of trawl doors
- reducing steaming speeds
- reducing towing speeds

The most common strategic changes reported were:

- diverting fishing effort to fishing grounds closer to the mainland
- changing the landing port to nearest port to fishing grounds to reduce steaming time
- replacing the engine with a more fuel efficient engine
- changing the fishing method and target species

Some vessels owners did not make these changes purely because of high fuel prices. For example, a vessel owner replacing an engine may have brought forward this investment in order to benefit from lower fuel consumption or the scheduled change may simply have coincided with the price increases.

Some vessel owners have also been considering their current fuel purchasing practices including the possibility of entering bulk-buying schemes.

Degree of uptake

Many vessel owners found it difficult to comment on what proportion of vessels in their segment have already adopted fuel use efficiency measures or to comment on the value of benefit to the fishing industry as a result of adopting fuel efficiency measures. Table 3 contains a summary of uptake, barriers, costs and benefits of various fuel efficiency measures taken by vessels in the survey sample. Cost and benefits are classified in approximate categories of low, medium, high based on data collected in this survey and based on knowledge of Seafish technical staff.

Table III Estimated uptake, barriers, costs and benefits of fuel efficient measures

Measure	Estimated Industry Uptake	Barriers to uptake	Costs	Benefit
Change fishing strategy	Most		£	√√
Reduce towing speed	Most	Knowledge	-	√
Reduce steaming speed	Most	Knowledge	-	√
Change landing port	Some	Knowledge	£	√√
Replacing engine	Few	Cost	£££	√√
Change fishing method	Few	All	££	√
Change target species	Few	Legal	££	√
Stop fishing	Few	Cost	£	√
Modify gear	Most	Knowledge & cost	£	√√√
Improve maintenance	Few	Knowledge & cost	£	√
Fit gear monitoring unit	Few	Cost	££	√
Reduce crew costs	Few	Practical	-	√

Most interviewees have made simple changes such as reducing towing and steaming speeds as these have little cost and some benefit to fishing vessels. Very few have made more costly changes such as replacing the engine and changing fishing method or target species. Before the UK fleet can diversify into these fuel efficient measures, barriers to uptake need to be addressed.

Barriers to increased uptake

It would seem realistic that high fuel prices would automatically lead all fishermen to take the appropriate action to maximise fuel efficiency. However, there are still several barriers to increased uptake; the main barriers are knowledge, costs, legal requirements and practicalities.

Our preliminary research findings show there are further improvements that can be made to help increase uptake. Transfer of knowledge is the key in many cases. This is a market failure as small vessel businesses don't have the resources, time, money or contacts to scan their environment to get the best information they need to maximise efficiency. This market failure is not unique to the catching sector but one that concerns small businesses in general. Many studies of knowledge use in small businesses recognise that knowledge is gained through the experience of specific individuals *within* the organisation^{vii}.

Knowledge is of critical importance when making any decision. Given the diverse nature of the fishing industry it is impossible to expect every fisherman to hold expert knowledge of all areas critical to his operation e.g. navel architecture, gear technology, mechanics, electronics, refrigeration, marketing etc. It is important that fishermen have access to knowledge held elsewhere in the catching sector to guide their decision making. Environmental scanning, therefore becomes very important.

In order to guide fishermen towards a less fuel dependent future, substantial knowledge gaps need to be filled and this information needs to be communicated effectively. Gaps exist across the board from vessel design, propulsion, and gear design through to basic vessel operation. Seafish port seminars, gear courses and workshops are helping to bridge these gaps.

Impact of legislation / regulation on fuel inefficiencies and wider economic and environmental impacts

It is important to understand the impact of legislation / regulation on fuel inefficiencies as well as the wider impact of the changes in industry practice as a result of high fuel prices. This information will be particularly valuable in guiding policy, as well as informing the wider industry of general trends, issues and opportunities. This information is not available yet but will be included in the final Seafish report on "options for improving fuel efficiency in the UK fishing fleet" when it is completed.

EMERGING ISSUES AND OPPORTUNITIES / CONCLUSION

There are emerging opportunities for improving fuel efficiency for both the fishing industry and policy makers.

For industry it is clear that no one solution will be the answer for all members of the fleet. Each vessel owner can benefit from considering fuel efficient measures and evaluating the potential benefit of uptake for their individual vessels. Dissemination of knowledge between skippers / vessel owners is important to ensure maximum efficiency of current gear. Seafish port seminars, gear courses and workshops are helping to achieve this.

For policy makers in fisheries administrations it is important to recognise the pressures increased fuel prices put on the industry. The findings from the survey suggest interventions to encourage investment in

fuel efficient engines, gear and technologies would be most welcome. In addition low rate sources of capital and incentives for research and development could have both a concrete financial benefit to the fleet and support carbon emission reduction targets of the government. Funding to assist in the development of new media for improving fishermen's knowledge and understanding of optimal use of existing gear could also play a big part in curbing current knowledge gaps.

REFERENCES

Fish Update News, August 9 2005, Boats already struggling over fuel, www.fishupdate.com

Pittaway, Thorpe, Holt and Macpherson, Lancaster University Management School Working paper 2005/020, *Knowledge within small and medium-sized firms: A systematic review of the evidence*".

The Royal Bank of Scotland Group, 2006, The Outlook for Refined Products' Prices, www.rbs.com/economics p. 1/5.

Seafish, United Kingdom, *The Impact of the Increase of the Oil Price in European Fisheries: Impact on the UK Fishing Fleet*, project no. IP/B/PECH/ST/2005-142, p 3.

Seafish, United Kingdom, 2^{viii}006 fleet forecast, www.seafish.co.uk.

ⁱ Fish Update News, August 9 2005, Boats already struggling over fuel, www.fishupdate.com.

ⁱⁱ The Royal Bank of Scotland Group, 2006, The Outlook for Refined Products' Prices, www.rbs.com/economics p. 1/5.

ⁱⁱⁱ The Seafish Industry Authority, United Kingdom, 2006 fleet forecast, www.seafish.co.uk.

^{iv} The Seafish Industry Authority, United Kingdom, The Impact of the Increase of the Oil Price in European Fisheries: Impact on the UK Fishing Fleet, project no. IP/B/PECH/ST/2005-142, p 3.

^v Defined for the purpose of this research as the ratio of fuel use: value of fish caught.

^{vi} Source: Department for Environment, Food & Rural Affairs

^{vii} Pittaway, Thorpe, Holt and Macpherson, Lancaster University Management School Working paper 2005/020, *Knowledge within small and medium-sized firms: A systematic review of the evidence*" p10.