



Backgrounder Fishing Vessel Energy Efficiency Workshops

Background

Fish harvesters know only too well that soaring fuel prices are reducing the profitability of their traditional fishing enterprises; many believe the increased expenses are threatening the economic stability of the entire sector. The prospect of sustained high fuel prices has provoked widespread interest in finding energy efficiency strategies to mitigate the overall impact to industry.

Because of the importance of this issue to the industry, and the potential environmental benefits, such as reduced CO₂ emissions, a multi-agency committee has been formed to recommend ways and means to reduce fuel consumption in the short, medium, and long term. Participating organizations include

- Fish Food & Allied Workers Union,
- Canadian Centre for Fisheries Innovation,
- Newfoundland & Labrador Department of Fisheries and Aquaculture,
- Department of Fisheries and Oceans,
- Marine Institute,
- National Research Council-IRAP, and
- MUN Engineering.

Purpose & Objectives

The main purpose of the Fishing Vessel Energy Efficiency Workshops is to identify a program of activities that will assist in cutting fuel costs in the harvesting sector. A principal objective is to focus on initiatives that can be implemented in the short term. To provide focus and direction a measurable goal of a reduction in energy consumption of 20% by 2009 has been established. Such a clear and measurable goal will also assist in selecting the best options for energy reduction, provide a benchmark for program effectiveness and encourage fish harvester participation in the initiative.

Additional objectives include:

- An analysis of industry fuel consumption based on current practices/situations

- Quantifying the potential fuel savings by implementing specific energy efficient measures
- Informing harvesters and stakeholders of the pro's and con's of specific energy efficient alternatives
- Identifying main areas where energy efficiency gains can be made
- Providing a basis for decision making on short-term energy efficiency initiatives and possible medium and long term options for further consideration

Approach

Fuel costs are affected by a variety of factors including vessel design, fishing technology, type of fishery, weather, vessel maintenance and operating practices. The project will examine each of these elements, various related factors and secondary influences to arrive at a series of action plans. Each of the elements identified below will be analyzed and discussed at the regional workshops:

Research on activities and ideas in other jurisdictions

Energy efficiency in the fish harvesting sector is a global concern. A significant amount of research has been undertaken to address concerns over rising fuel costs in other jurisdictions. Much can be learned from what has been undertaken in other jurisdictions to avoid unnecessary duplication and supplement aspects of this project.

Research on potential savings on various efficiency measures

Design Modifications

This component involves research and analysis of the potential benefits of modifying existing vessel hulls and/or making changes to vessel propulsion and stability. Key topics include:

- Propeller
 - Nozzle propeller advantages and disadvantages
 - Controllable pitch vs. fixed pitch
 - RPM influence
 - Propeller optimization
 - Diameter Influence
- Bulbous bows
- Vessel extensions
 - Mid-ship vs. aft;
 - Issues of the different materials of construction; fiberglass, fiberglass over wood, steel, aluminum, etc.
 - Powering comparison

- Anti-roll tanks
 - Review relative to paravanes and batwings
- Length-to-beam ratios

In each case, the pro's and con's, cost considerations and feasibility will be analyzed and discussed.

Operating Modifications

This component will explore operating changes that can be made to improve energy efficiency without significantly altering the vessel or equipment. Research topics include:

- An assessment of standard vessel operating behavior
 - Vessel speeds
 - Weather and timing of voyages
 - Engine maintenance
 - Two-stroke vs. four-stroke engines
 - Alternate fuels, e.g. Bunker C
 - Exhaust heat recovery
- Hull maintenance
- Fuel metering systems
- Hotel loads & ghost weights
- Other

Considerations for Newbuilds

- Specific requirements of each fishing operation
- Economic considerations of operation
- Design specific considerations
- Cost benefit analysis
- Build/design contracts
- Benefits of comprehensive all encompassing engineered design

Assessments of a Representative Sample of the Harvesting Fleet

To better understand the areas for potential fuel savings, simulations will be conducted on a cross section of vessels. One vessel from each of the following length classes will be part of the assessment:

- 30' to 39'11"
- 40' to 54'11"
- 55' to 65'

A checklist will be developed, and each vessel will be assessed as follows:

- Engine type
- Fuel type
- Propeller type
- Gear box type and reduction
- Hull form
- Anti-roll device
- Length-to-beam ratio
- Estimated fuel consumption
- Vessel maintenance
 - Engine
 - Hull
- Normal operating speed
- Trawling software used

The information collected will be used to develop a profile of the typical vessel in each length class and an estimation of energy consumption and relative efficiency. The simulations will be conducted based on a model developed by MUN Engineering.

The fleet profile will assist in determining which fuel reduction alternatives are most practical and can be implemented in the short term.

Fishing Technology

Mobile gear fisheries are known to be more fuel-intensive compared to other fisheries. In recent years there have been advancements in gear technologies that have the potential to reduce resistance, drag and overall fuel consumption. Examples include trawl sensor systems, high aspect doors, new efficient trawl designs, etc.

Key topics to be assessed in the area of fishing technology include:

- Trawling direction
- Operational monitoring
- Trawling speeds & horsepower
- Towing resistance
- Composite netting materials
- Door and component design and suitability
- Net size to horsepower ratios
- Other

Industry Survey and Questionnaire

The purpose of this component of the project is to collect information and perspectives from fishermen on fuel costs and energy efficiency as they apply to the industry overall and to their specific vessel operation. Information will be collected by the FFAW through regional meetings and a telephone questionnaire and will be used to assist in the development of options and strategies to reduce fuel consumption.

Final Output

This initiative will culminate in a series of nine regional workshops with fish harvesters to be held in centralized locations across the province. The locations for the workshops are St. John's, Clarendville, Gander, Marystown, Baie Verte, Harbour Breton, Stephenville, Plum Point and Mary's Harbour (dates for the events are located on the event registration form). The goal of the workshops will be to disseminate information about energy efficiency alternatives with a view to raising awareness of potential alternatives that could be introduced before the 2009 fishing season to reduce fuel costs.

Following the workshops a series of fact sheets will be developed to disseminate information to harvesters about a variety of vessel and energy efficiency topics. The fact sheets will be informative and educational in nature using empirical evidence and local studies and experience.