



# Fishing Vessel Energy Efficiency Workshops

**Summary of Presentations**

**November 20, 2008**

# Main Causes of Fuel Inefficiency

- ❖ **The Vessel Operator -**
- ❖ **Regular Maintenance – hulls & engine**
- ❖ **Hull designs – disproportionate length to beam ratios;**
  - ❖ **Most have < 3 to 1 ratio**
  - ❖ **“Wider not Better”**
- ❖ **Propellers – type incorrect diameter or pitch**
- ❖ **How well matched Engines / Gearbox / Propeller are compatible**

# What Can I Do To Save Fuel?

- **Short – Medium – Long Term**
- **Focus on Short Term !**
  - ✓ **What is Practical?**
  - ✓ **What is Affordable?**
  - ✓ **What is Measurable?**
  - ✓ **What will give the best Rate of Return?**

# Fuel Flow Metering



*Gallons/Liters per hour  
Gallons/Liters consumed  
Gallons/Liters remaining  
Nautical miles per gallon / Liters  
per nautical mile*

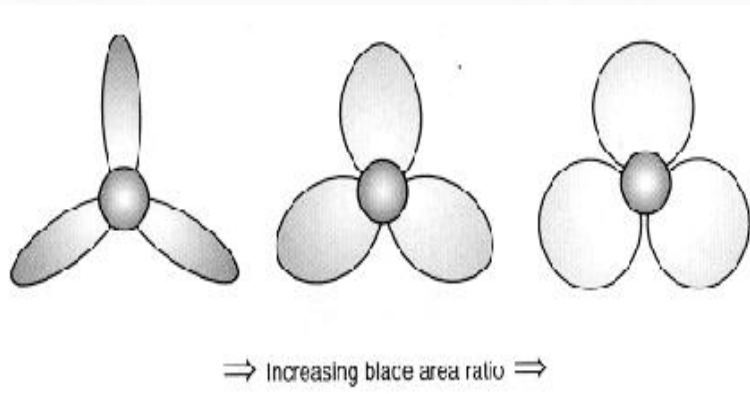
- ✓ Install Flow meter
  - ✓ Outboard motors \$200
  - ✓ Midsized engines \$1500
- ✓ Change operating behavior
  - ✓ Slow Down !
  - ✓ Reduce RPM's by 10% from full throttle can save 20% in fuel

# Hull Maintenance

- Fouling significantly increases vessel drag
- A fouled propeller
  - increase fuel consumption by 14%
- Fouled hull
  - Increased fuel consumption by up to 24%.
- Two recommendations:
  1. Clean the hull / prop annually
  2. Coat hull with proper anti-fouling paint
    - the smoother the better



# Propeller



- Diameter is the single most important factor in determining fuel efficiency
- A change to a larger-diameter propeller can improve performance measurably
- One study demonstrated 30% reduction in fuel consumption at cruising speed, and a 27 percent increase in bollard pull (maximum towing force).

# Roll Dampening Devices

- Paravanes & Batwings add significantly to vessel resistance and add to your fuel cost
- Anti-Roll Tanks very effective for all speeds
  - Can be installed away from work / hold areas
  - Must be custom designed to stability & roll of each boat



# Vessel Modifications

## Bulbous Bows

Effective at reducing resistance at cruising speeds 6 – 10 knots

✓ improved fuel efficiency & reduction in pitch motion

✓ Bulbs need to be tailored to boat hull characteristics

Est. cost is \$120-140,000

✓ One owner estimated he saved 15% on his annual fuel bill because of improved cruising speeds



# Engine Maintenance

- ✓ **Follow regular maintenance schedule**
  - ✓ **Oil changes**
  - ✓ **Fuel filters**
  - ✓ **Check your stacks**



# Vessel Extensions / Modifications

- **Adding a piece at the stern is preferred to cutting at midship**
- **Extension could eliminate submerged transom and result in additional energy savings**

# Review of Fishing Operations

- **How well do your trawl components match?**
- **Is the door size “right”**
- **Variety of Options to “lighten” trawl to reduce drag**
- **Footgear - is all this weight necessary**
- **Sensor technology can improve door / trawl performance**

# What Can I Do In The Short Term?

☑ **Conduct a fuel audit of your vessel**

☑ **Install a Fuel Meter**

☑ **Pull Back on Throttle**

☑ **Plan for Longer Trips**

☑ **Regular Hull Maintenance**

☑ **Regular Engine Maintenance**

**= Est. Fuel Savings 20% + Improved Vessel  
Performance**

# What Can I Do In The Short Term?

- ✓ **Propeller**
  - ✓ **Check size / type / condition / pitch**
    - ☑ **Replace or repair ?**
- ✓ **Fairing hull - sonar domes/ice deflectors/keel coolers**
- ✓ **Anti Roll Tank**
  - ☑ **Must be custom fit / tuned to vessel roll conditions**
- ✓ **Consider a 4 Stroke vs. 2 Stroke**
- ✓ **Review Your Trawling Gear**
  - ✓ **Make modifications / changes where beneficial**

# Future Considerations

- Medium Term
  - Vessel extension
    - Bulbous bow
    - Stern extension
- Longer term
  - New vessel construction
  - Designed for energy efficiency & performance

# Conclusion

- Goal is to Reduce Industry Fuel Cost by 20%
- Objective: Raise Awareness of Practical Options Can Improve Performance & Fuel Efficiency
- Options & Amount of Fuel Savings Depend on Vessel Type, Volume / Species Fished, Distance Traveled
- World Fuel Prices are highly volatile !!
- Be Pro-active – Start a fuel saving program now



**Thank You**

Questions