

BIODIESEL FOR MARINE APPLICATIONS

A “CHICKEN OR THE EGG” SITUATION

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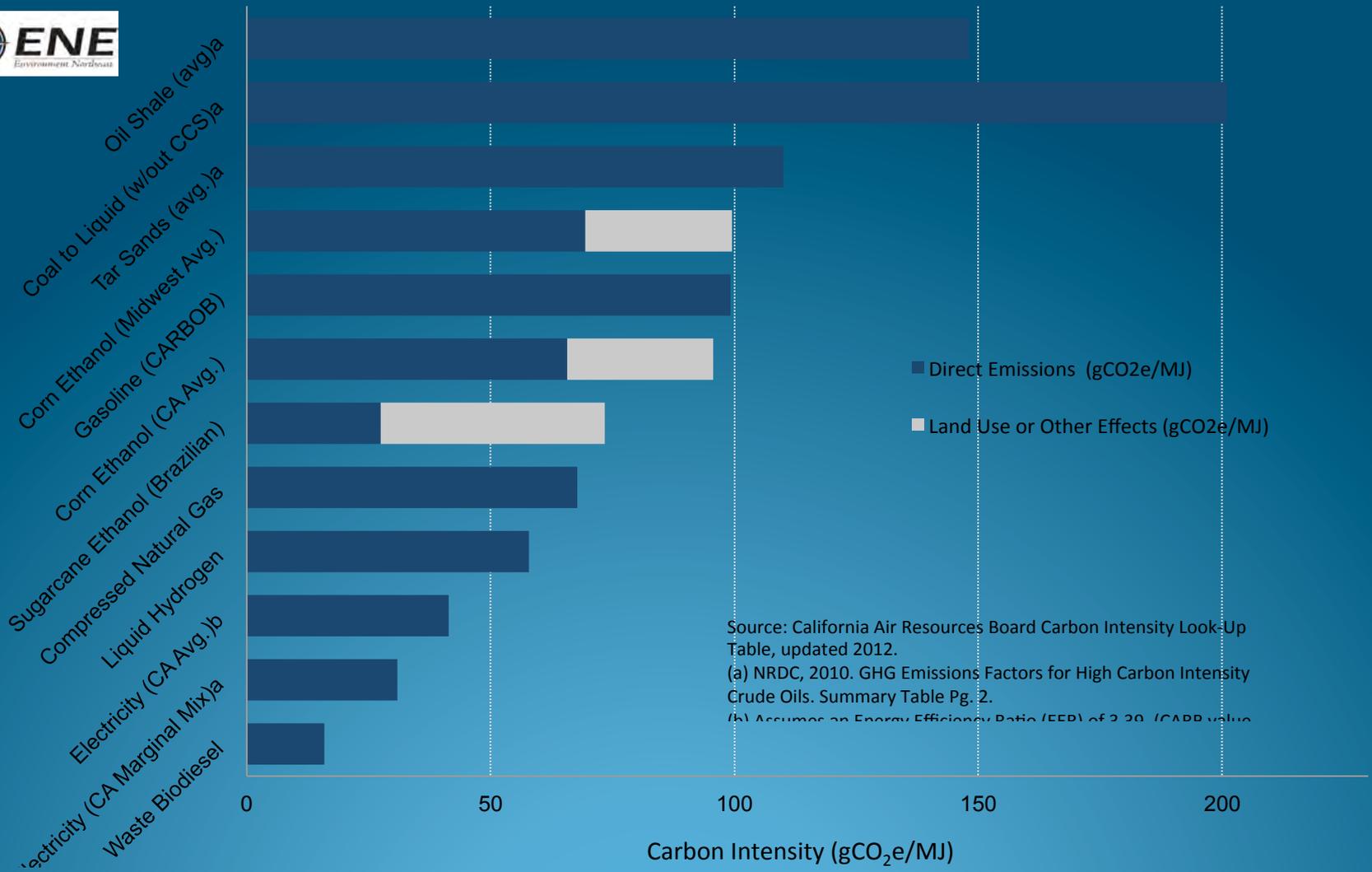
WHY BIODIESEL?



“BIODIESEL IS THE BEST FUEL ON THE PLANET”

- **BIODIESEL REDUCES GHG EMISSIONS BY 89%**
- **EVERY UNIT OF ENERGY PUT INTO PRODUCING BIODIESEL YIELDS 7 UNITS OF USEABLE ENERGY**
- **BLENDS DIRECTLY WITH PETROLEUM DIESEL**
- **20% BIODIESEL BLENDED WITH ULTRA LOW SULFUR PETROLEUM DIESEL HAS LOWER EMISSIONS THAN NATURAL GAS**
- **READY TO USE TODAY – NO NEED TO MODIFY ENGINES**

CARBON INTENSITY OF FUELS



Source: California Air Resources Board Carbon Intensity Look-Up Table, updated 2012.
 (a) NRDC, 2010. GHG Emissions Factors for High Carbon Intensity Crude Oils. Summary Table Pg. 2.
 (b) Assumes an Energy Efficiency Ratio (EER) of 2.29. (CARB value)

PRODUCTION OF BIODIESEL IN THE PRESENCE OF A CATALYST

COMBINING

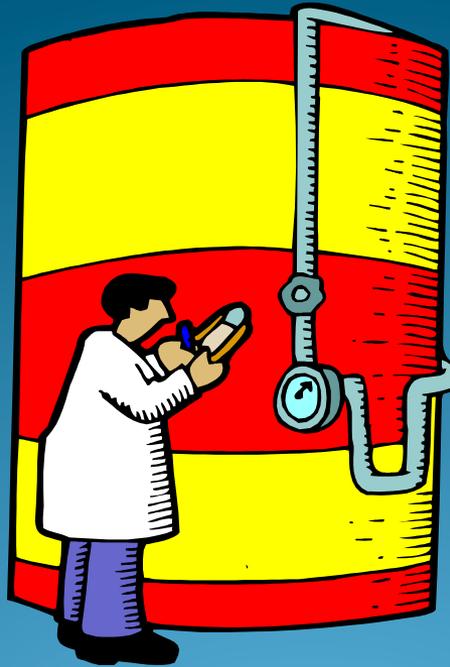
VEGETABLE OIL

(100 lbs)

+

METHANOL

(10lbs)



YIELDS

BIODIESEL

(100 lbs)

+

GLYCERIN

(10LBS)

MADE TO ASTM D6751 SPECIFICATIONS

INTRODUCING BIODIESEL TO THE MARINE MARKET

CHICKEN OR THE EGG?

- PEOPLE WANT TO USE BIODIESEL, BUT WHERE CAN THEY GET IT?
- MARINA WANTS TO SELL BIODIESEL, BUT WILL ENOUGH PEOPLE BUY IT?
 - NEED TO DEDICATE A TANK
- WHAT BLEND LEVEL SHOULD BE SOLD?

CONCERNS WITH BIODIESEL IN THE MARINE MARKET

- HISTORY OF ETHANOL
 - CAUSED FIBERGLASS TANKS TO DISSOLVE
 - NOT GOOD FOR SMALL ENGINES (OUTBOARDS)

NO SUCH ISSUES WITH BIODIESEL

- CONCERN FOR WATER IN THE FUEL
 - BIODIESEL CAN ABSORB WATER

TREAT CAREFULLY LIKE NORMAL FUEL

- OEM WARRANTIES
 - SOME MARINE ENGINE WARRANTIES DO NOT SUPPORT HIGHER BLENDS

CONTINUALLY CHANGING TO HIGHER BLENDS

EARLY MARINE BIODIESEL PROJECTS

- **GREAT LAKES & CHESAPEAKE RECREATIONAL MARKET**
 - B-100 IN 5 GALLON CONTAINERS
- **CHANNEL ISLANDS NATIONAL PARK**
 - B-100 IN BOATS & FACILITIES
- **PORT OF SEATTLE AND SEATTLE FERRY SYSTEM**
 - B-20 IN PORT EQUIPMENT AND LARGE FERRYS
- **RHODE ISLAND BIODIESEL GRANT**
 - OLD PORT MARINE LAUNCHES
 - SAVE THE BAY VESSELS
- **ATLANTIC CUP**
 - BLENDING BIODIESEL ON ALL RACE BOATS

RESEARCH VESSEL PROGRAMS

- **DUKE UNIVERSITY**

- COLLECTED WASTE VEGETABLE OIL
- USED ABOARD R/V HATTERAS

- **UNIVERSITY OF RHODE ISLAND**

- CONTRACT FOR B-5 BIODIESEL ABOARD THE R/V ENDEAVOR



LOCAL PROJECTS

- **OLIVER HAZARD PERRY**

- **CATERPILLAR ENGINES COULD USE B-100**
- **GENERATORS WARRANTY ONLY TO B-20**
- **NOW USING B-20 FOR ALL ENGINES ON BOARD**



LOCAL PROJECTS

VOLVO OCEAN RACE NEWPORT STOPOVER

- BIODIESEL USED FOR ALL ONSHORE POWER
- BIODIESEL BLEND USED ON ALL RACE BOATS FOR RACE TO PORTUGAL
- SAVED OVER 38,000 LBS OF CARBON DIOXIDE EMISSIONS



© Amalia INFANTE - THE BOAT YARD: Life behind the Sails

LOCAL PROJECTS

- **SAILORS FOR THE SEA**

- USE OF BIODIESEL A CRITERIA FOR “GREEN REGATTAS”
- SEVERAL YACHT CLUBS CHANGING TO B-20

- **STORM TRYSAIL CLUB SUSTAINABILITY COMMITTEE**

- **NEWPORT BERMUDA RACE**

- BIODIESEL TO BE USED ABOARD S/V SELEMAT



WHERE DO WE GO FROM HERE?

- **RHODE ISLAND MASTER SALES AGREEMENT**
 - **REQUIRES PURCHASE OF B-5, B-20 OR B-99**
- **WORKING WITH LOBSTER FLEET IN NEWPORT**
 - **RI DEM READY TO PROVIDE ACCESS FOR DELIVERY TRUCKS**
- **LOOKING FOR MARINA WITH ABILITY TO DEDICATE A TANK**
- **LOOKING FOR SHIPYARD TO USE BIODIESEL FOR ONSHORE EQUIPMENT**
- **CONTINUED EFFORTS WITH YACHTING COMMUNITY**

SUMMARY

- **BIODIESEL IS AN IMPORTANT FUEL THAT CAN HELP ADDRESS CLIMATE CHANGE ISSUES**
 - **WE NEED TO WORK TOWARD INCREASING THE VOLUME OF BIODIESEL USED IN MARINE APPLICATIONS**
 - **RI STATE ENERGY PLAN PROPOSES ALL DIESEL IN RI MUST BE A B-20 BLEND BY 2035**
- **NEWPORT BIODIESEL CAN PROVIDE A LOCAL SOLUTION FOR ATTAINING THESE OBJECTIVES**

QUESTIONS?

