

Imperium Renewables

*INNOVATING RENEWABLES FOR THE
FUTURE:*

*Biomass Research and Development Board
Technical Advisory Committee Meeting
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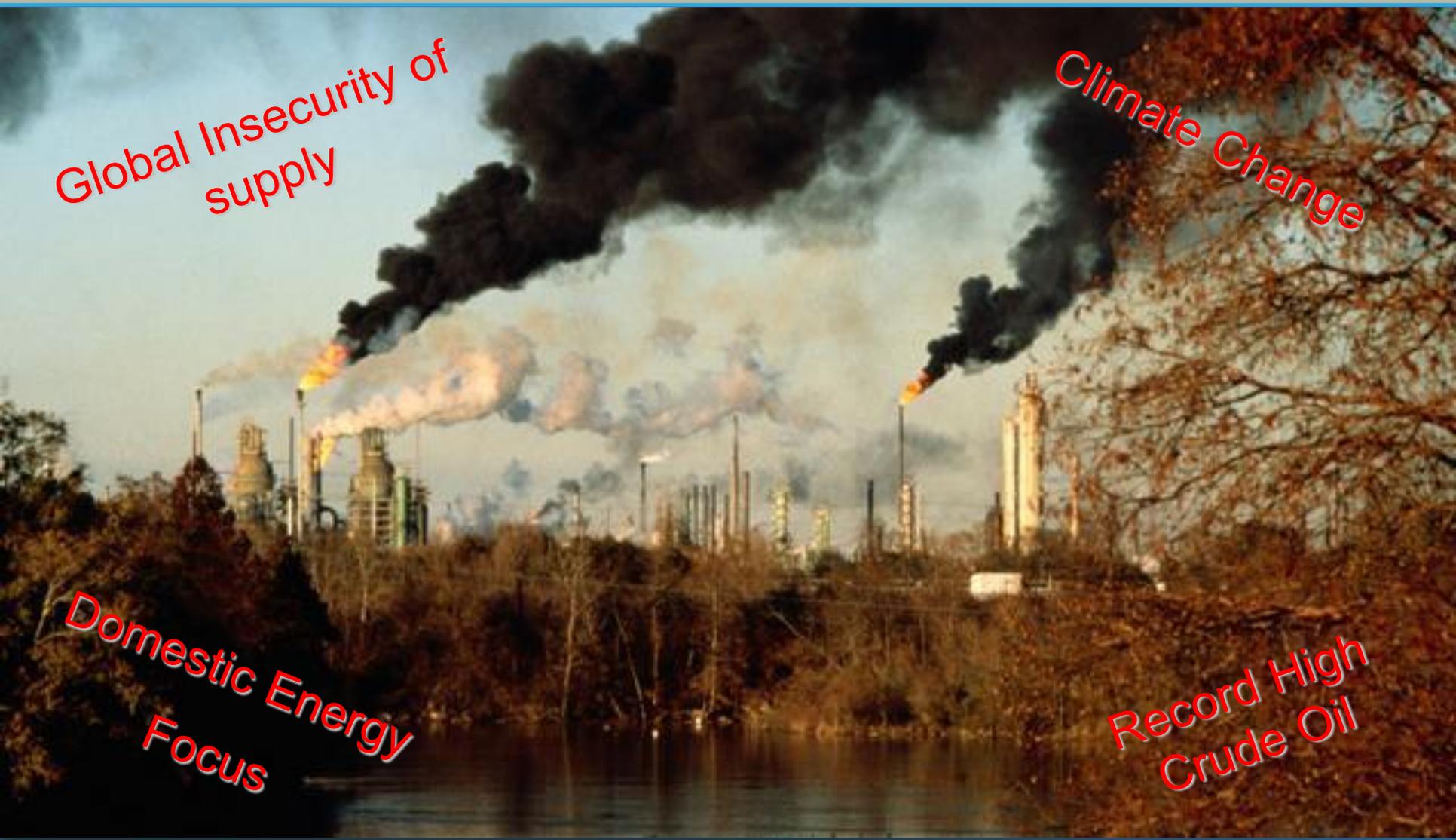
- Company founded in 2004
- \$275M in capital raised since 2005
- Focused on innovation and practical commercialization efforts for scale
- 44 employees in locations, Grays Harbor and Seattle
- 100 million gallons (378M Liters) of annual biodiesel capacity – operational since 2007
- Profitable since Q4-'09
- Strong foundation for growth in revenue, profit and new construction in 2012 and beyond
- Long term stable business relationships with proven track record of high quality fuel and rateable supply

Imperium Grays Harbor (IGH)



- One of the largest BQ9000 biodiesel facilities in the U.S.
- Current site is 10.5 acres
 - Additional 14 acres adjacent for new construction
- Biodiesel production sourced from 100% canola oil
 - Established relationships with major feedstock producers
 - Reliable supplier to petroleum industry
 - Major supplier to BC and AB RFS and LCFS markets
 - Top Tier RINs

Catalyst for **Change** at Hand



Global Insecurity of
supply

Climate Change

Domestic Energy
Focus

Record High
Crude Oil

- Energy Security/Operational Energy Supply major factor for the future of Military
- Political and Economic Risks to governments are extremely high with current energy supply
- Climate change risk has been highlighted by DOD as major risk factor for US and the World due to instability
- Diversification of Energy Supply can save lives
- Renewable Energy/Conservation reduces cost burden of Energy to DOD



“Our challenge... is to build a military force that uses energy as a strategic advantage rather than bears it as a burden.”

Secretary of Defense – Leon Panetta

Operational Energy Strategy: Implementation Plan

Department of Defense

March 2012

PACNORWEST Fuel Demand



1. Manchester Navy Fuel Depot (Bremerton, WA) –230 nautical miles, 90 miles from IAFB
2. Naval Air Station (Whidbey, WA.) –196 miles from IAFB
3. Defense Fuels Supply Point Puget Sound 96 miles from IAFB
4. Lewis McChord Air Force Base (Tacoma, WA) 69 miles from IAFB

Total Fuel Demand for DOD ~ 110MGY (400MLY)

HRJ Production Technology

- Hydrotreated Renewable Jet/Diesel production process to be located at IGH
- Only type of technology currently available that is on track for ASTM and OEM approval over next three years
- IGH location would include:
 - 100MGY facility/6,500 BBL per day
 - No technology risk – EPC contract available for facility
 - Multiple products
 - Renewable Jet fuel such as HRJ5/8 renewable fuel
 - Renewable Diesel/HRD76
 - Business model would be for use of current oilseed crops – canola, soy, UCO
 - Future oilseed crops such as camelina, algae, jatropha as those crops scale
- Initial estimates for construction of HRJ unit \approx \$250M (+/-30%)
- Significant cost savings available by using existing infrastructure for future production of renewable jet fuel by building at IGH



- **HRJ facility co-located at our current biodiesel facility creates significant economic benefit to the region**
 - **Project would provide large-scale economic development in the rural area of Grays Harbor, Washington:**
 - **350 construction jobs**
 - **50 additional jobs at IGH**
 - **Increased opportunity for Veterans for employment in Grays Harbor County**
 - **Up to 210 indirect job created in Grays Harbor County by project**
 - **Over \$200,000,000 of economic stimulus into the PNW region to contractors and suppliers for project execution**
 - **Located in Rural Area under USDA designation**
 - **Project would create destination for much of the new feedstock development occurring in non-food oilseeds development in the U.S. and globally**
 - **Algae**
 - **Camelina**
 - **Directly supports Executive Order 13514 – Provides fuel compliance for EISA Sec. 526**

Maximize Renewable Jet Fuel Production Options

- ❖ **Integrated bio-refinery - maximize aviation/military fuel**
- ❖ **Wide range of biomass feedstocks by using alcohols as feedstock for future process inputs**
- ❖ **End fuel product must be “drop-in” replacement and complement ASTM specifications**
- ❖ **Superior performance to petroleum supply**
- ❖ **Operational and energy security**
- ❖ **Economic stability to fuel markets over the long term**



Biomass



Processing



Infrastructure



Application

IRI Alcohol to Jet Fuel (ATJ) Strategy



- IRI proprietary development of technology for drop-in renewable jet fuel
- In development with PNNL (Battelle Lab) for Alcohol to Jet fuel technology
 - Technology development focused on converting mixed alcohols into hydrocarbon equivalent “drop-in” fuels for aviation and other transportation fuels
 - Ethanol
 - Mixed alcohols
 - Allows for the use of feedstocks from existing biomass sources in PNW which are sustainable and economically viable in the long-term
 - Forest and agriculture wastes
 - Municipal solid waste
 - Research started in July 2010 with joint funding from IRI and Battelle
 - Sample of finished fuel for testing completed in August 2011
 - Boeing and Navy testing fuel for “fit for purpose”
- Received \$4M in Q4-'11 from DOE for biomass to jet fuel funding opportunity in collaboration with the following organizations and being led by LanzaTech



- **Advanced Biofuel Production is expensive and challenging, but ready for commercialization now**
- **Long term stable policy is needed in North America to support biofuels and dedicated biomass for viable advancement of the industry**
 - Just like current forms of energy have received for the last 80 years
 - Governments need to leverage their buying power to provide long term purchase commitments for advanced biofuels
- **Multiple solutions are needed for Advanced Biofuel to succeed**
 - Various feedstocks on regional basis that take into account, land use, water use, yields
 - Various technologies for conversion of biomass to drop-in fuels to allow for diversification and long term economic and environmental sustainability
- **Biofuels can be cost competitive with petroleum**
 - Once overall supply is built to scale
 - Progress to parity can be accelerated to less than 10 years with more funding and support

Oil sands and Shale gas do not provide energy security

