10-13-10 Overview: Coal to Liquids Technology

<target><bill></bill><subject>10-13-10 Overview Coal to Liquids Technology</subject><comm>HENE26</comm></target>

ALASKA STATE LEGISLATURE

SENATOR LESIL McGUIRE
Chair, Senate Special Committee on Energy

MEMORANDUM

Date: October 13, 2010

To: Kirsten Waid, Senate Secretary

From: Senator Lesil McGuire, Chair
Senate Special Committee on Energy

Re: JOINT Senate Special Committee on Energy & House Committee on Energy Schedule

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Committee Schedule
JOINT Senate Special Committee on Energy & House Committee on Energy
For the week of October 11-15

Wednesday, October 13th @ 1:30 p.m. – 3:00 p.m.

+ * Coal to Liquids Technology
  - Presentations by Tyonek Native Corporation & Accelergy Corporation

* First Hearing in First Committee of Referral
\+ Teleconferenced
= Bill was Previously Heard/Scheduled

2160

Coal-To-Liquids Plant
Tyonek Location

A Solution for Alaska & the USAF

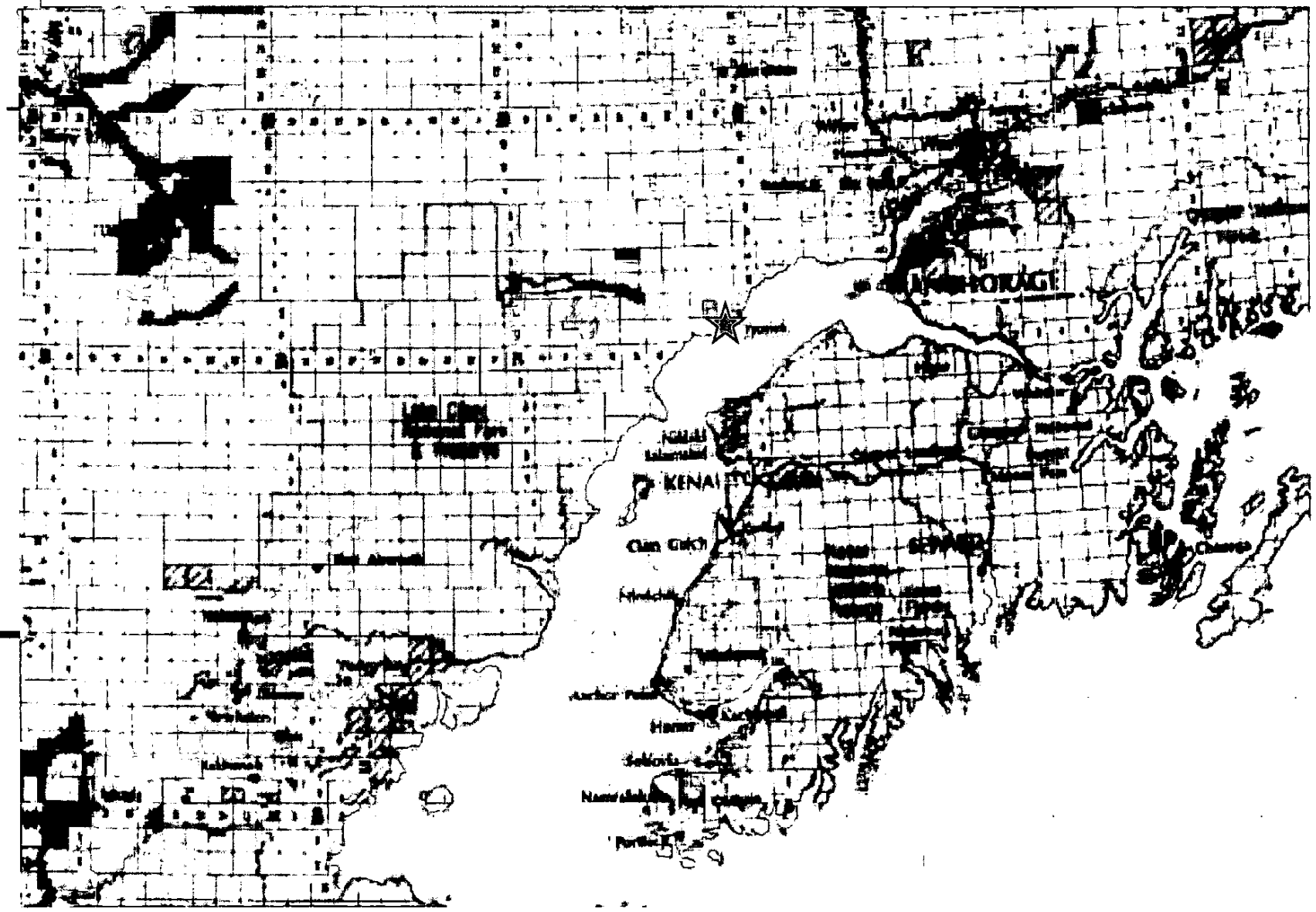
Tyonek Native Corporation

1689 C Street, Suite 201

Anchorage, Alaska 99501

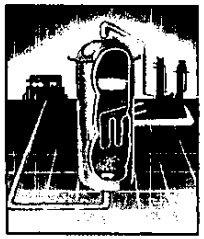
13 October 2010

South Central Alaska- Cook Inlet



DNR

2 billion Tons Bituminous Coal



COOK INLET/SUSITNA COAL PROVINCE

4 coal leases

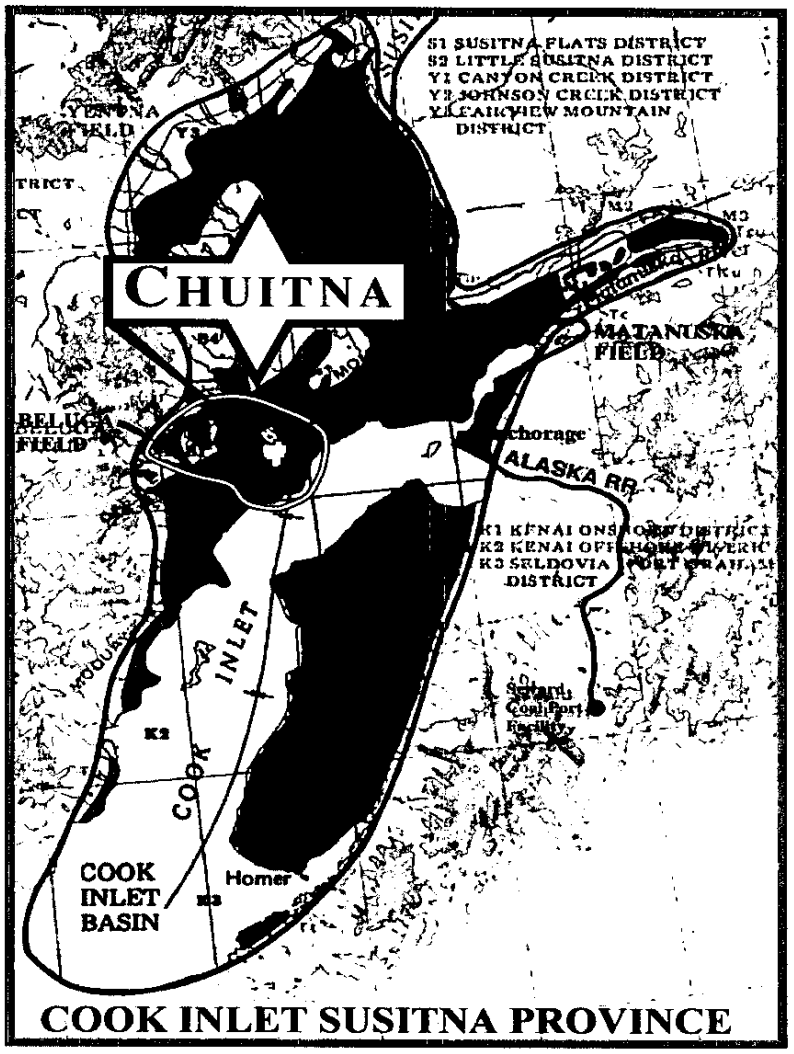
Area of Influence

surface rights coal - to Regional Corp

Resource & Reserve Summary

million tons of coal – billion of barrels of equivalent liquids

Coal Resource	M-tons	B-bbls
° Hypothetical Resource	64,230	96
° Identified Resource	10,550	15.6
° Measured Resource	1,300	2.0
° Chuitna Proven Reserves	700	1.1
° Barrick Reserves	600	1.0
° Skwentna Reserves	500+	0.9

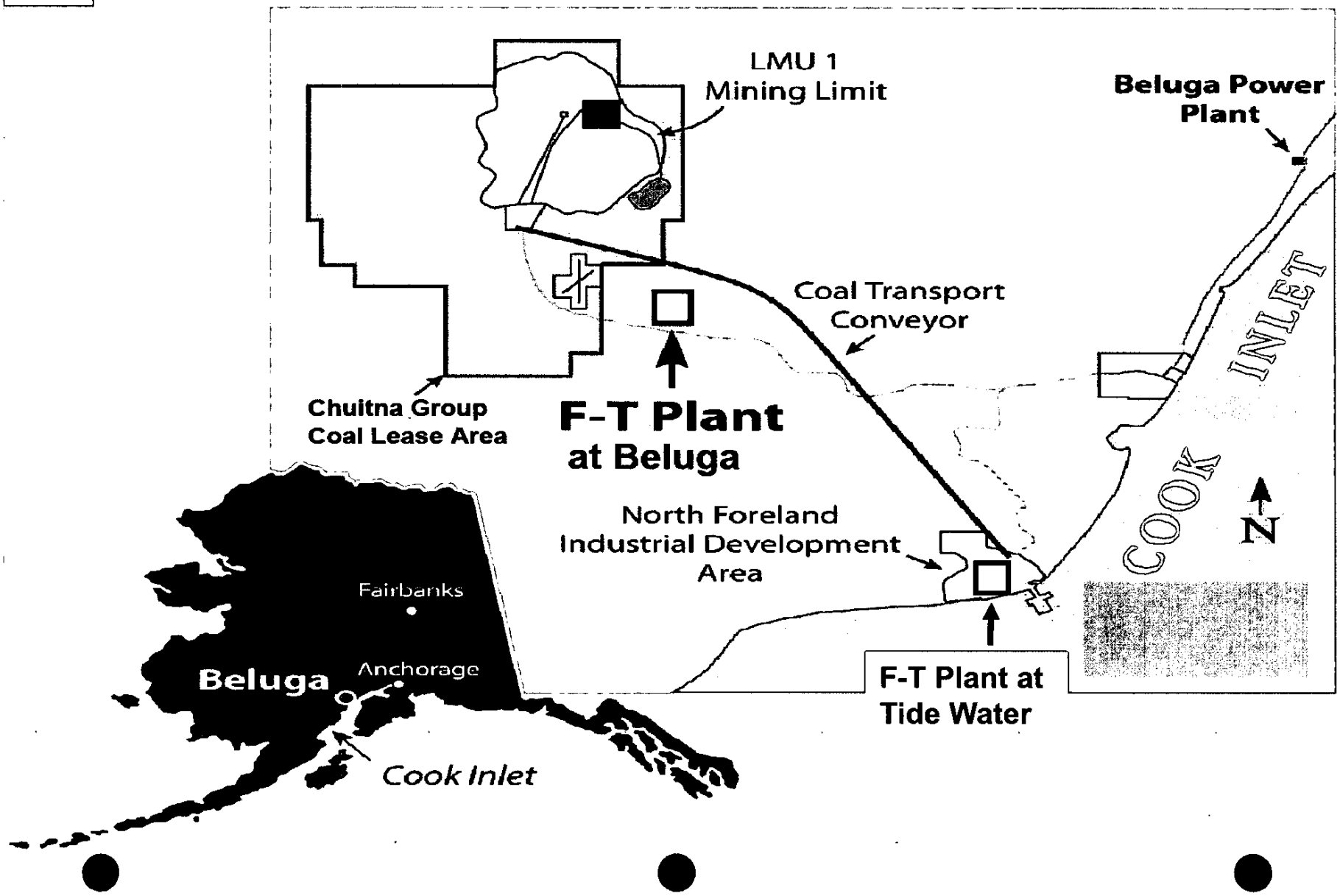


2163

Sasol coal to liquids

80,000 bbl/d Coal To Liquids "Beluga CTL Plant"

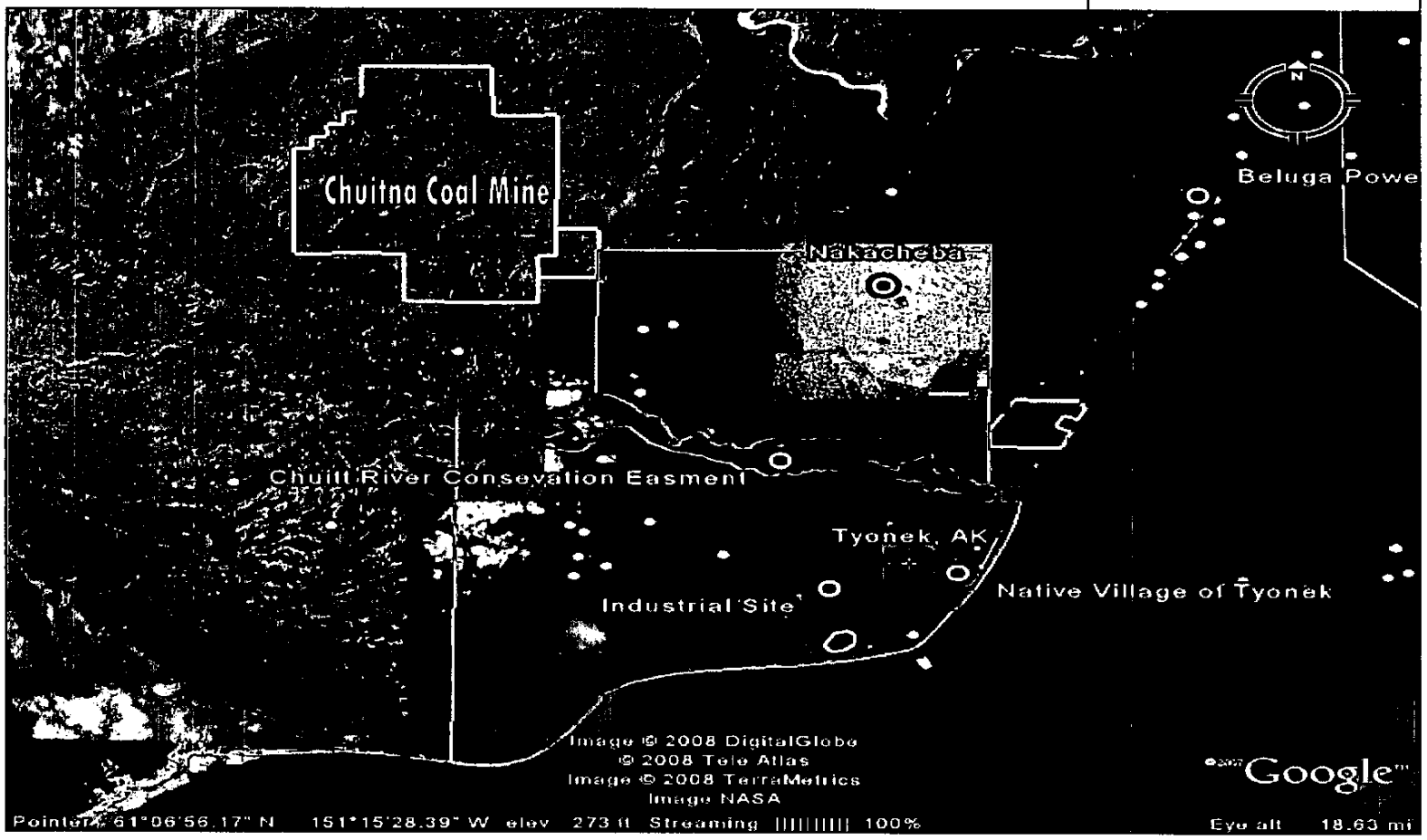
(Mine Mouth or Tide Water)



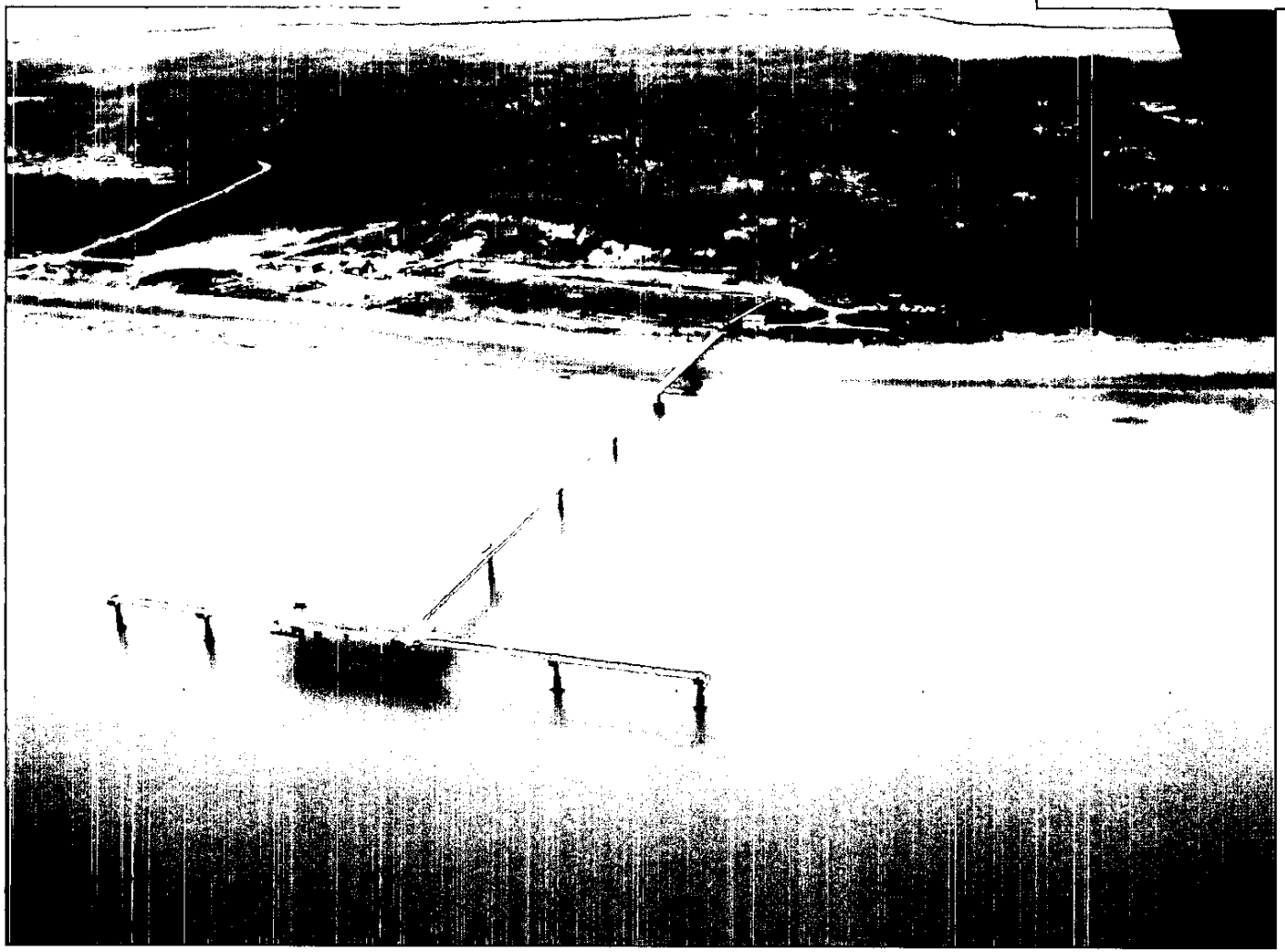
USAF Ak did not respond
Congressman Miller

Tyonek Area Lands Activity

Match or Better gas to
Coal Fisher Trope



North Foreland Industrial Site & Port



2008 Tyonek CTL History

- 'Alaska Beluga CTL Project' w/SASOL.
- USAF 'by 2016, 50% jet fuel will be CTL'.
- USAF BOO CTL plant, open contest for site.
- Tyonek presents to USAF Pentagon; Tyonek "most cost-effective CTL site in N.A."
- Cong. Miller restricts CTL programs.
- USAF only seek public/private partnership.
- SASOL drops USA development plans.

Penn. Coal to liquids

2009/2010 Tyonek CTL History

- TYONEK seeks CTL partner.
- Accelergy & Tyonek introduced.
- AIEDA & AEA enthused & supportive.
- No source for $500K matching grant to certify Tyonek coals to USAF.
- DNR main beneficiary of certification.
- Pennsylvania awards Accelergy $10MM.
- 'Emerging Energy Technology Fund' might furnish $125K Phase1 grant .

2168

Enabling legislation - Regulations - 5million fund
Royalty rate Coal/Gas
Jobs
Emerging technology fund
Fischer Tropf Technology
coal mining

ASSESSMENT OF MICRO CATALYTIC COAL LIQUEFACTION TECHNOLOGY (MCL) FOR CHUITNA (BELUGA MINE) COAL RESOURCE

$125,000.00

A PROPOSAL FOR

TYONEK NATIVE CORPORATION

AUGUST 4, 2010

2169

Questions or Comments?

Contact:

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Tyonek Native Corporation
1689 C Street, Suite 219
Anchorage AK 99501

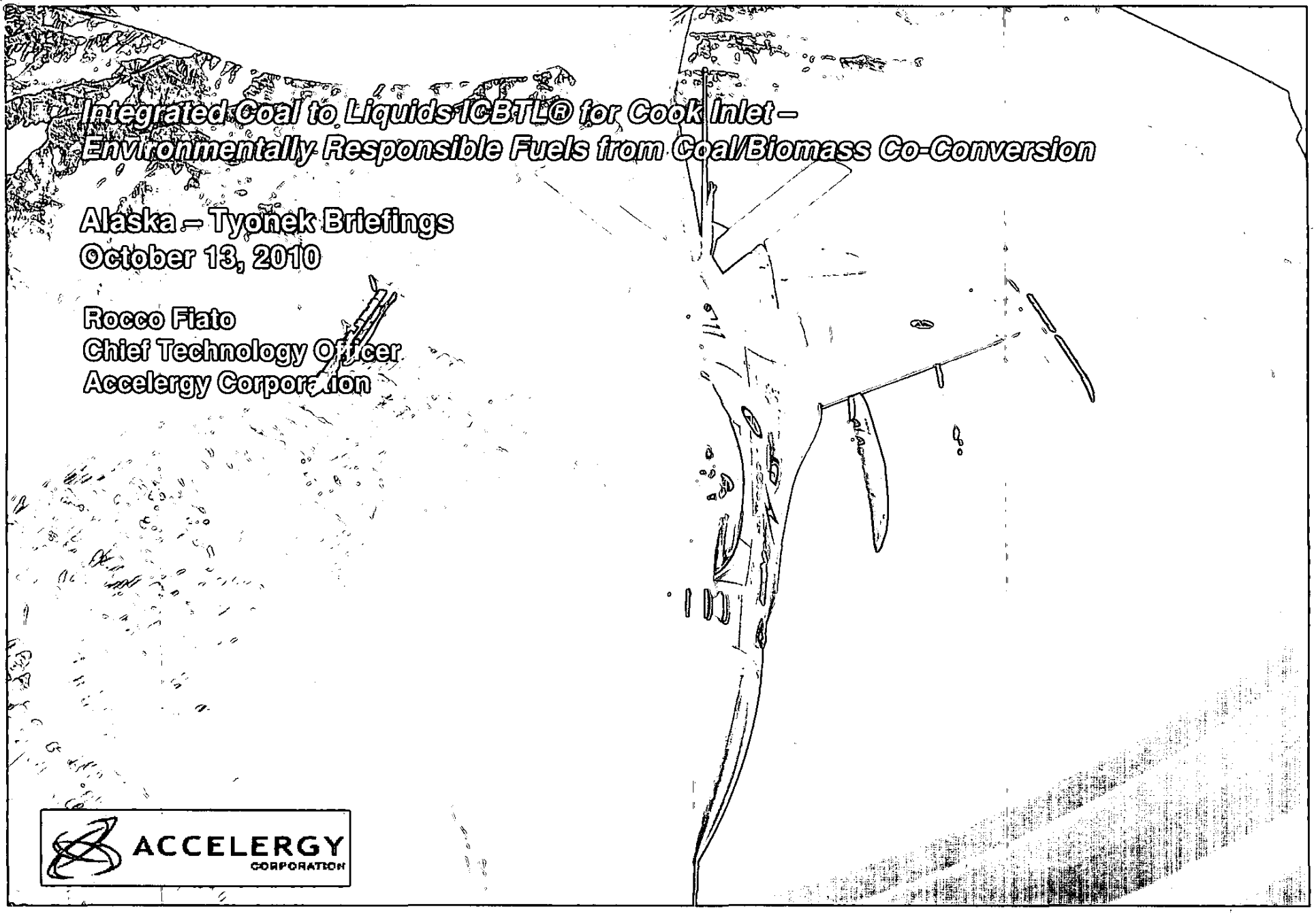
1(907)272-0707

jmcclellan@tyonek.com

– Integrated Coal to Liquids ICBTL® for Cook Inlet –
Environmentally Responsible Fuels from Coal/Biomass Co-Conversion

Alaska – Tyonek Briefings
October 13, 2010

Rocco Fiato
Chief Technology Officer
Accelergy Corporation



ACCELERGY CORPORATION

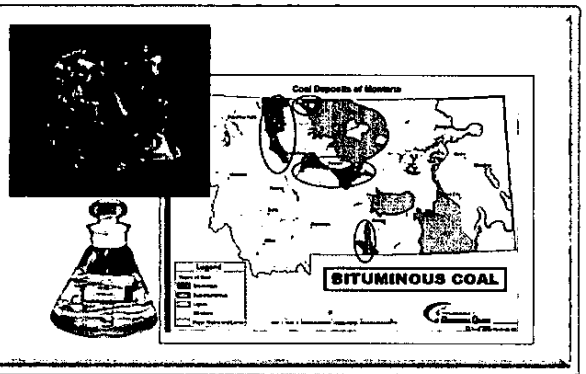
217

Waxman | Markey See 526

Today's Briefing Will Cover —

- Accelergy Introduction
- ICBTL Overview
- China Programs/Potential Partners in Alaska
- Pennsylvania Case Study
- Accelergy Tyonek Path Forward

Accelergy Corporation Addressing Challenges in Coal and Biomass Utilization



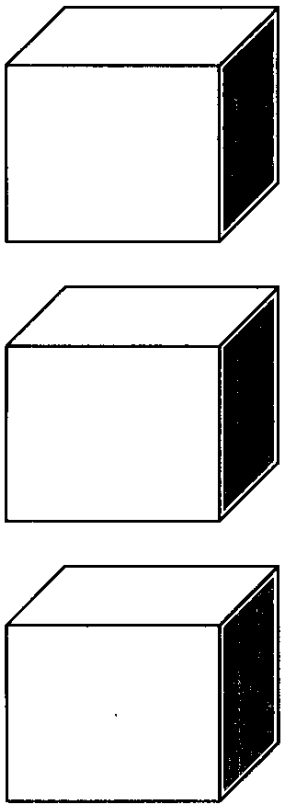
algae@work. ENERGY EERC ENN ExxonMobil MONTANA STATE UNIVERSITY Raytheon UTEP Viresco Energy

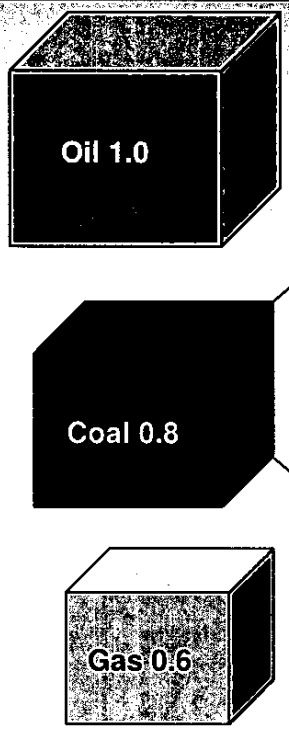
Goldman Sachs NthPOWER luxcapital SEQUOIA Advent International TECHNOLOGY PARTNERS Mobius Venture Capital

- **Emerging Leader in Advanced CBTL Processing**
- **Developing Clean Integrated Carbon-to-Liquids (ICTL) Technology via Strategic Licenses –**
  - **Direct Conversion** – ExxonMobil/EERC
  - **Indirect Conversion** – CAS/Raytheon/UTEP/Viresco
  - **Biomass Co-conversion** – A2BE/MSU/Raytheon/ENN
- **Alliances with Clean Coal Project Developers**
- **Experienced Global Management Team**
- **Support from DOE, DOD/AFRL/TARDEC and Leading Investors**

The Global Energy Challenge in Cubic Miles of Oil Equivalents

Global Energy Consumption
(Cubic Miles of Oil Equivalents CMOE)





To Replace Coal
We Would Need To Build
Each Year for 50 Years

32 New 1000 MW Nuclear Plants

Or

31,000 New 3MW Wind Mills

Or

28 Million New 5 KW Solar Panels

Average solution total cost
7+ Trillion Dollars

Source: SRI – Carlson & Malhotra Forbes August 2010

Cook Inlet Synthetic Jet Fuel Production - DOD/DLA Take-Away Issues

- Defining the Requirement
  - Quantity/Location
  - Commercial Sector Requirements
  - Feedstock Source/Plant Location Restrictions
  - Eielson AFB Requirements
- Structuring the RFP for Success
  - Section 526 Model – DOE/EPA LCA Criteria
  - Quality/Technical Criteria
  - Contract Length (Baucus Bill to Allow 20 Year Term for BTL Camelina Fuels)
  - Contract Pricing Structure
- How to Proceed
  - Establish Timeline for Acquisition
  - Pre-Feasibility/Down Select Process

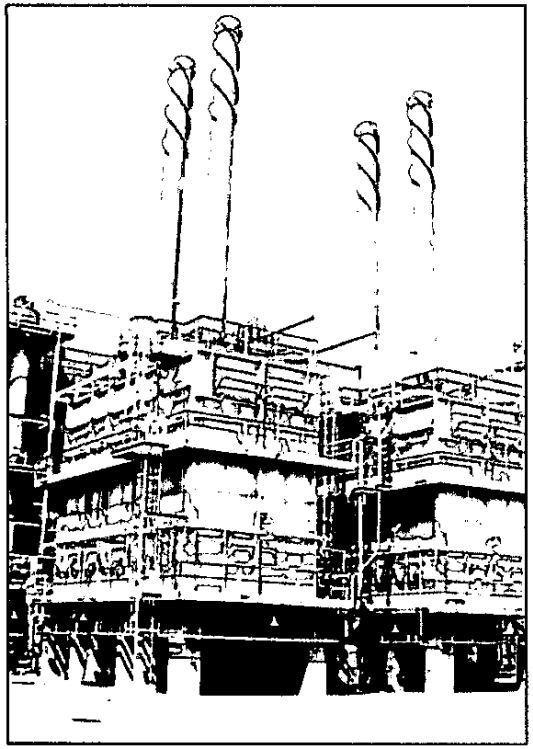
[redacted]

BACKGROUND

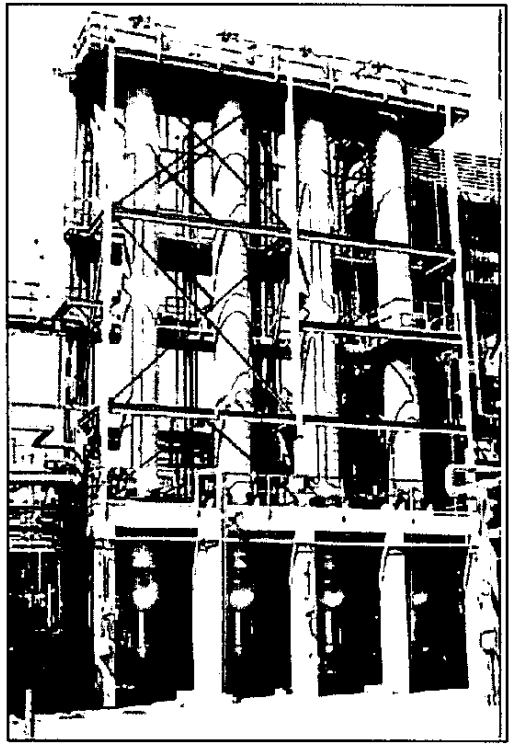
ACCELERGY EXXONMOBIL MCL® TECHNOLOGY SUPPORTED BY A VERY LARGE EXPERIMENTAL DATA BASE

- **Nine years** of coal operations on 75 lb/D pilot plant
  - All coal ranks, hundreds of yield periods
- **Six years** of operation on 1 T/D Pilot Plant
  - All coal ranks, fully integrated operations
- **Two plus** year program on 250 T/D demo unit
  - All coal ranks – achieved 90% service factor on bituminous coal
  - Integrated with a comprehensive equipment testing program
    - Over 90 individual engineering programs executed
- **Overall development involved 700+ people**
  - Over 100 engineers and researchers
  - 250 T/D demo manpower peaked at 500+ people
- Comprehensive modeling and engineering technology programs captured all learnings – translated into detailed design guides

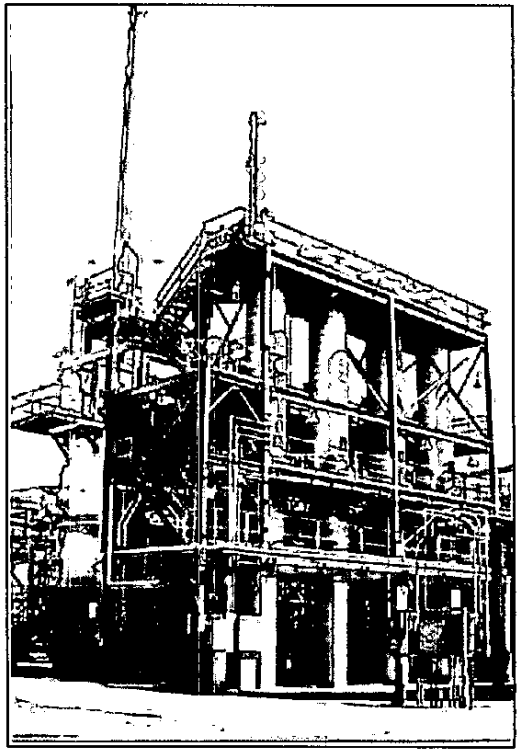
MCL® TECHNOLOGY BUILDS ON SUCCESSFUL $ 1 BILLION EDS DEVELOPMENT PROGRAM



Slurry Preheat Furnaces



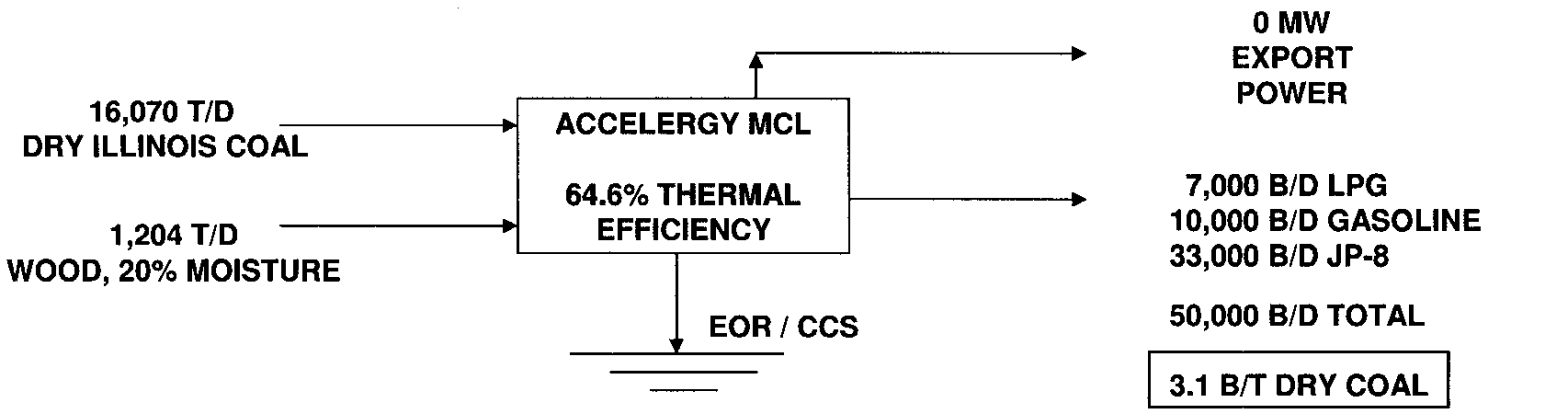
Liquefaction Reactors

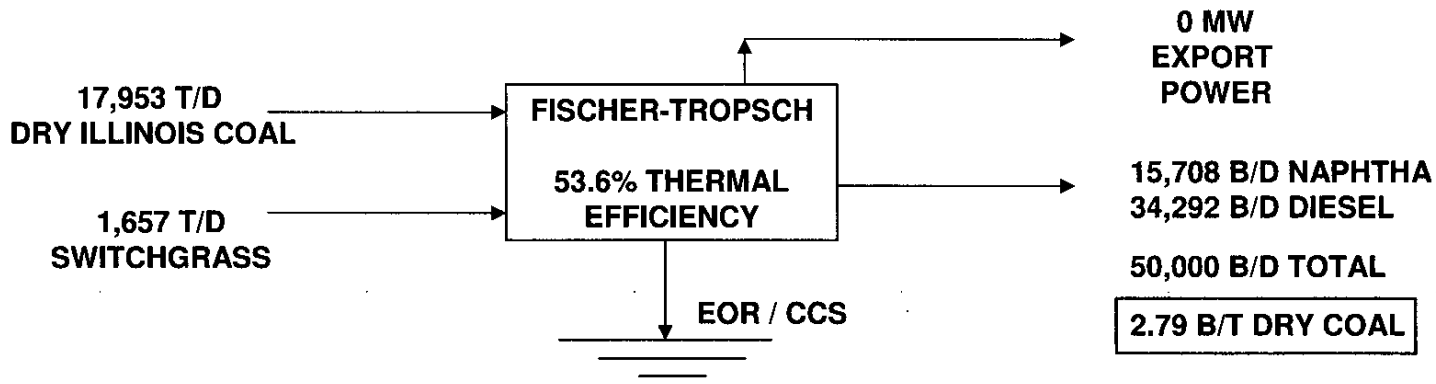


Solvent Hydrogenation

Service factor of 91% achieved in 250 T/D demo unit

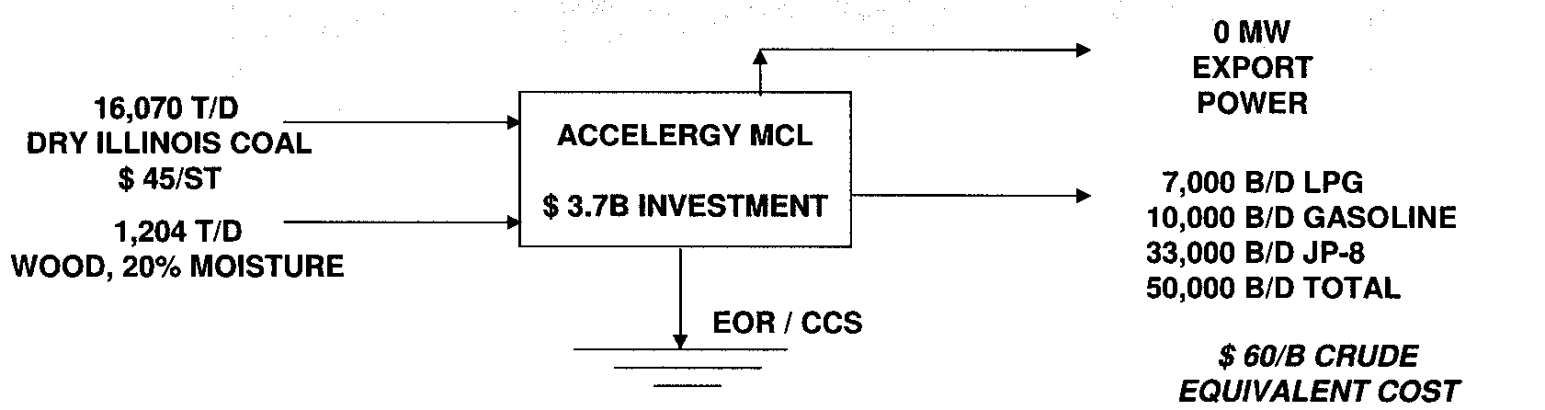
ACCELERGY MCL MUCH MORE EFFICIENT THAN FISCHER-TROPSCH

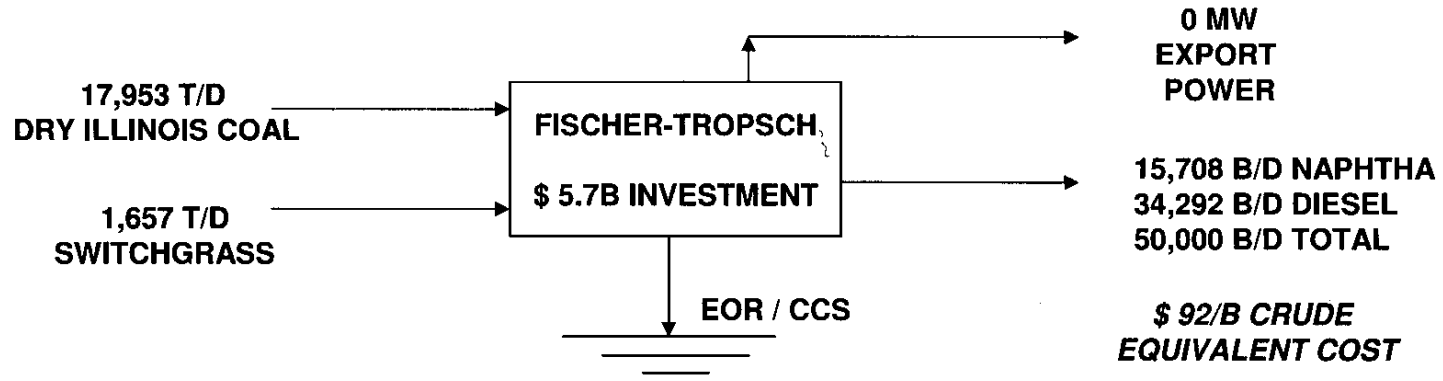




BOTH TECHNOGIES ACHIEVE EPA LCA TARGET OF 20% REDUCTION VERSUS PETROLEUM

LOWER INVESTMENT, LESS COAL , AND HIGHER QUALITY GASOLINE RESULT IN LARGE ECONOMIC ADVANTAGE





Cases exclude CO2 credit

ACCELERGY EXXONMOBIL MCL® TECHNOLOGY SUPPORTED BY A VERY LARGE EXPERIMENTAL DATA BASE

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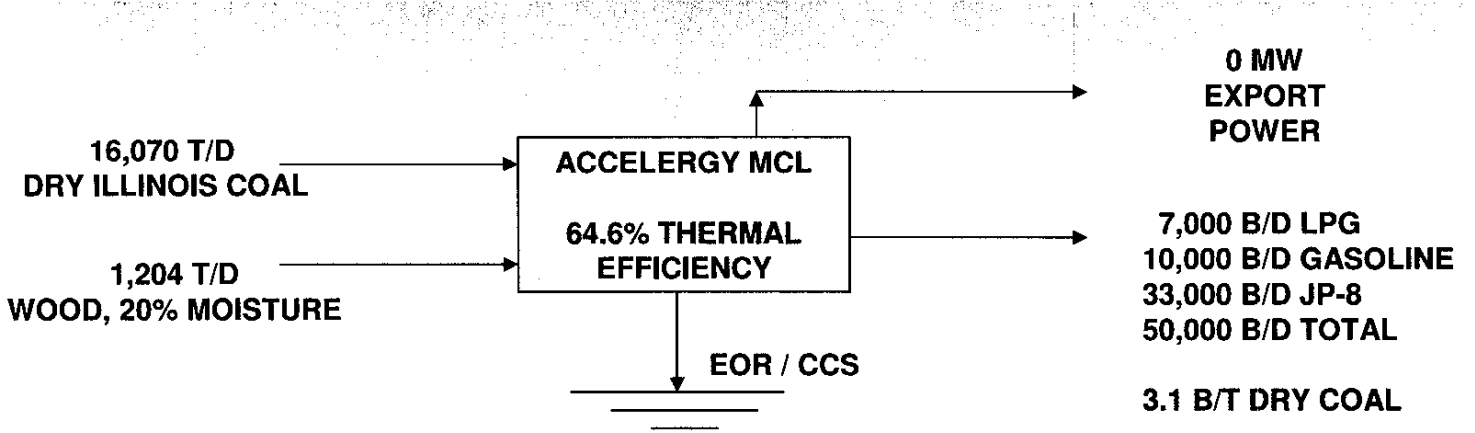
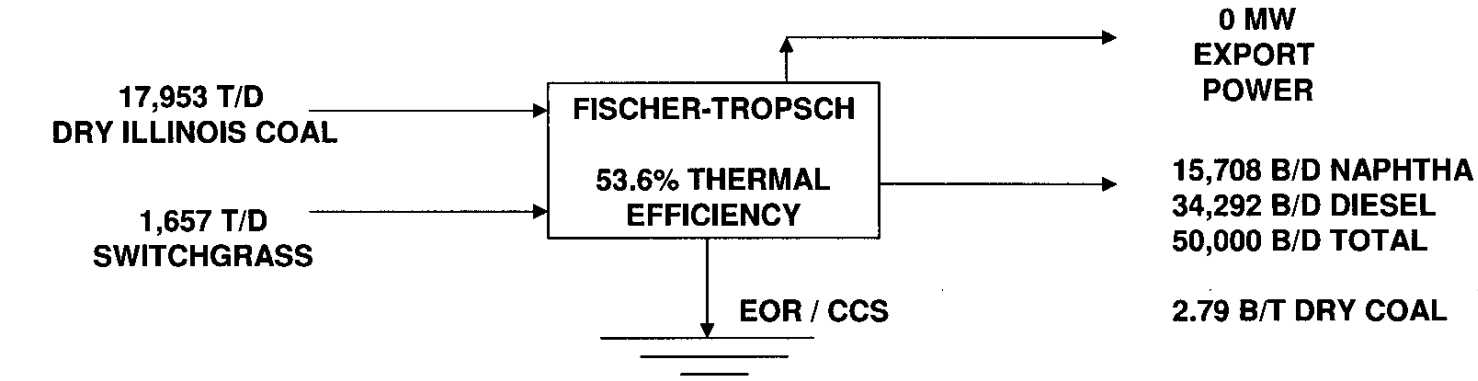
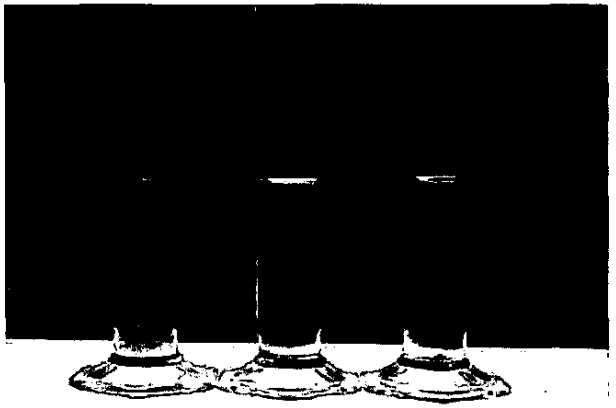


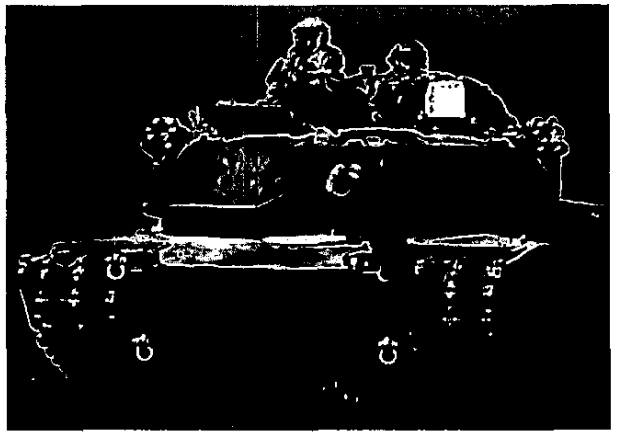


BOTH TECHNOGIES ACHIEVE EPA LCA TARGET OF 20% REDUCTION VERSUS PETROLEUM

DARPA Project Overview

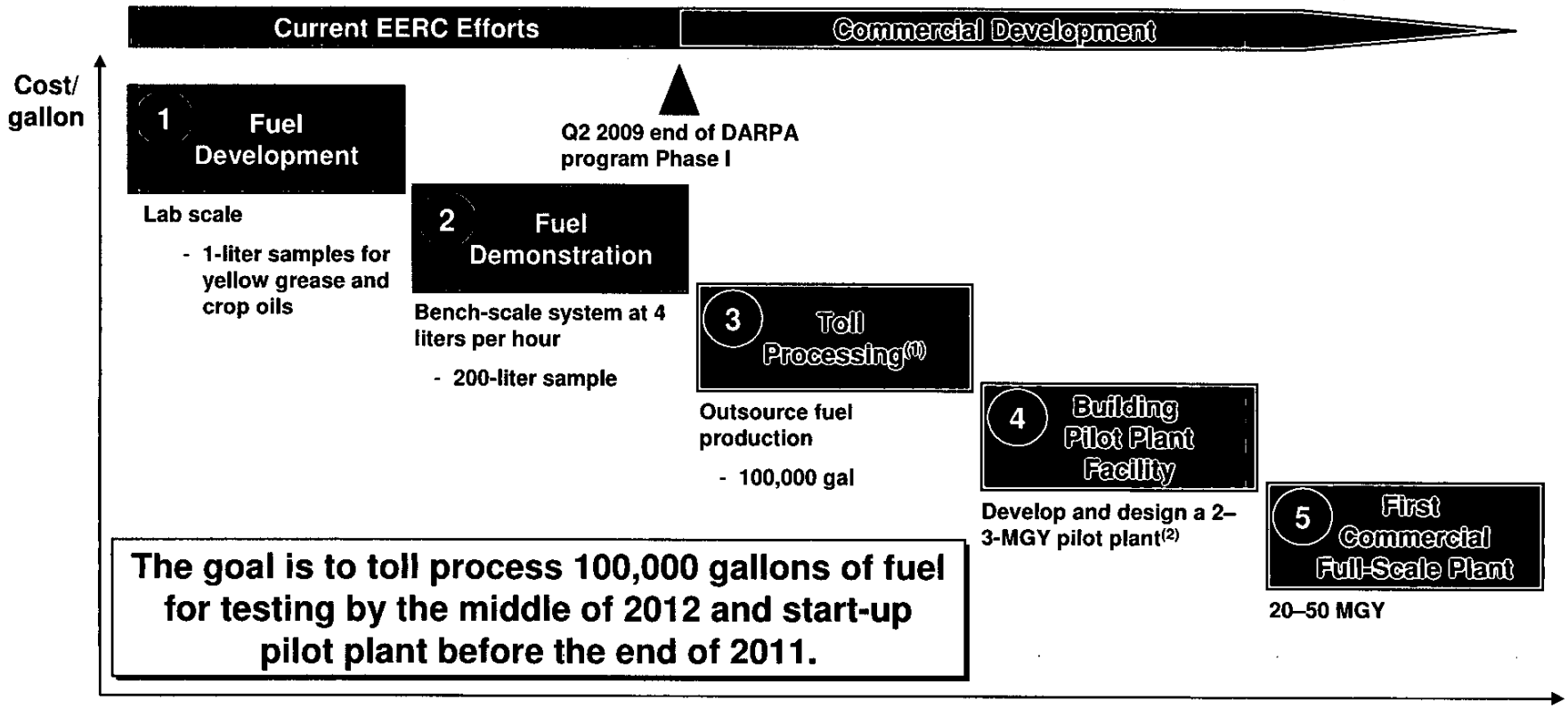
- Fuel sample submitted to U.S. Air Force
  - Qualified as JP-8 based on seven key fuel property-screening tests
  - Ahead of our development schedule
  - Ahead of our DARPA competition
- Economic modeling
  - Feedstock scenarios
  - Process scenarios
  - Evaluating field-to-fuel options based on feedstock production and processing economics
- Commercialization
  - Identifying partners and scenarios, partnership discussions ongoing
  - Assessing early market entry options





EERC
Energy & Environmental Research Center

EERC Is at a Stage Where the Technology Is Ready to Be Spun Off – With DPA Grant Enabling Program With Accelergy and Tesoro



(1) Several potential toll processors have been contacted.

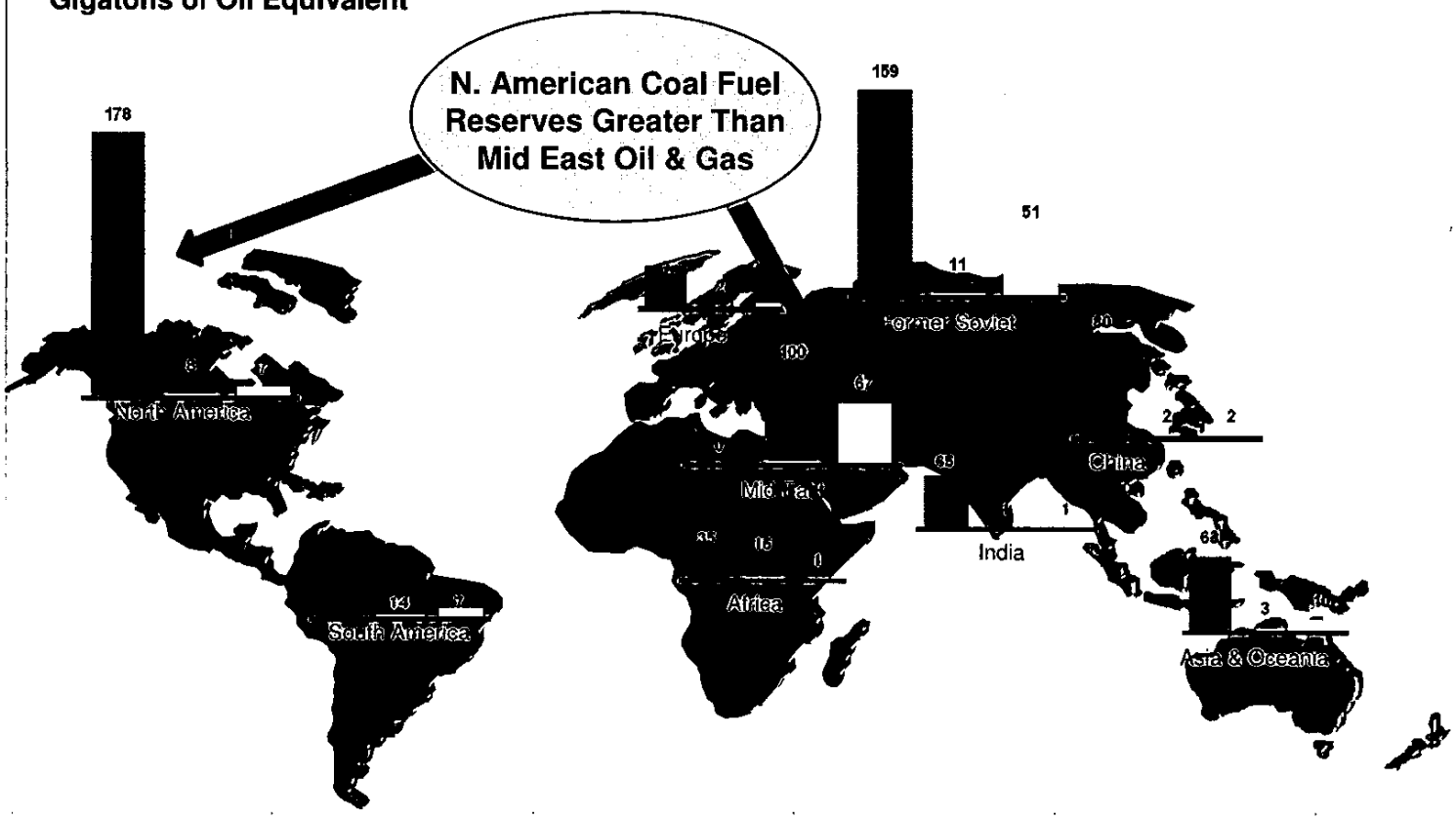
(2) Integrated with the Tesoro refinery. Starting engineering design at the beginning of Q3 2009.

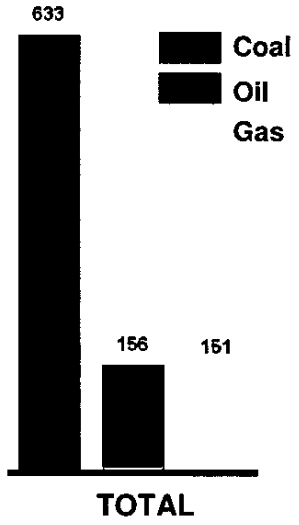
Coal Is More Abundant And Strategically Located Than Oil Or Gas

50% of Nation's Coal

Global Fossil Fuel Reserves

Gigatons of Oil Equivalent



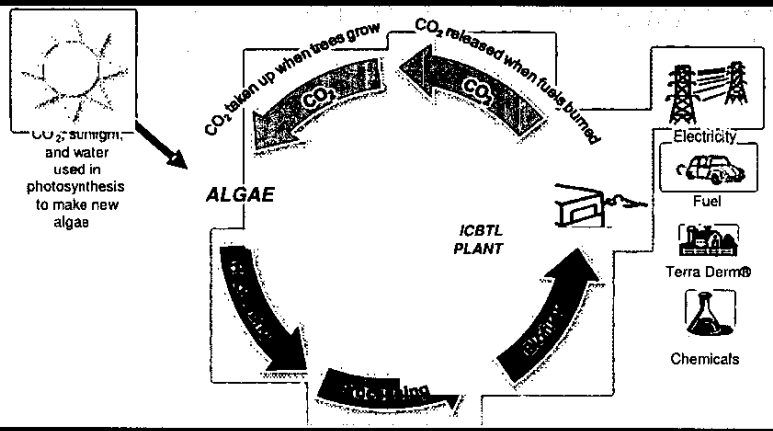


Top coal producers
2007

1. China
2. USA
3. Australia
4. India
5. South Africa
6. Russia

Source: World Coal Institute; BP Annual Statistic Review 2008

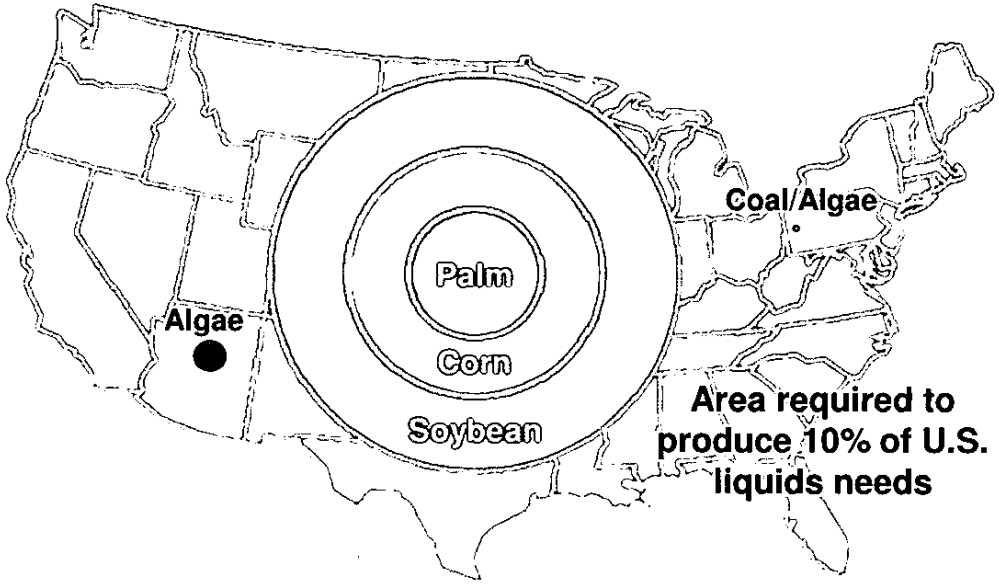
Algae – ICBTL Overcomes Land Use Issues with Biomass Fuels



8 KBD Plant	Feed Type	Acres of Land
BTL	Soy	2,452,800
BTL	Corn	943,384
BTL	Algae	12,264
CBTL	Algae/Coal	>4000
ICBTL®	Algae/Coal	<820

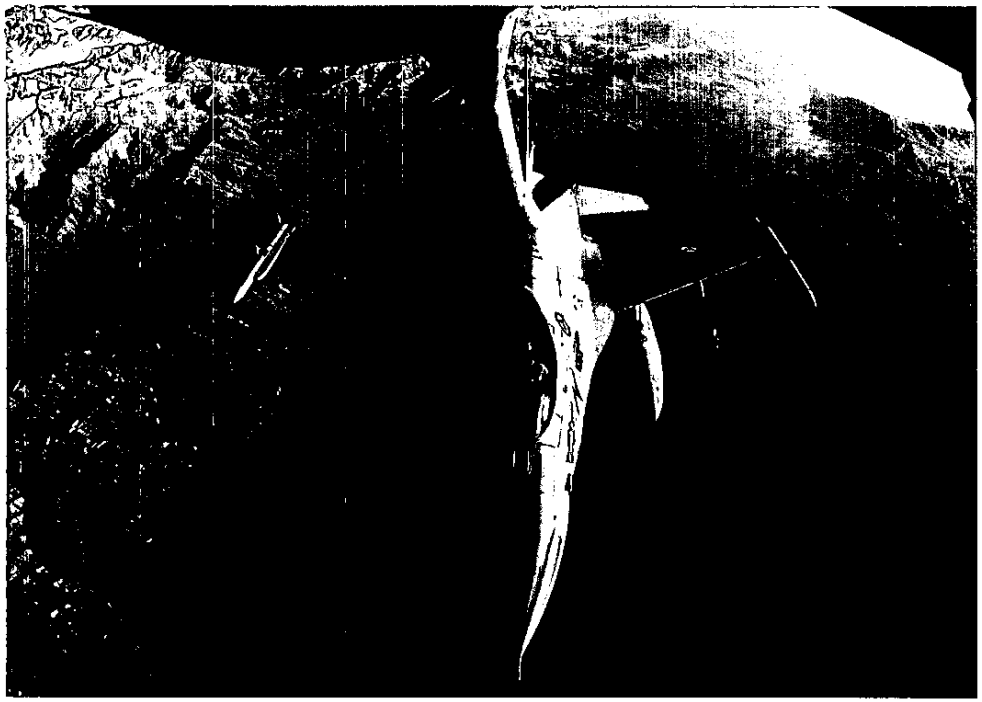
Note: 8KBD = 125 million gallons per year; ICBTL Employs Terra Derm®

Feedstock	Gal/Acre/Year
Soybean	40-50
Corn	100-130
Algae	3,000-10,000
Coal/Algae	>150,000



Area required to produce 10% of U.S. liquids needs

Commercial Implementation of Coal or Biomass to Liquids is Currently Limited Due To Deficiencies Of Existing Technologies

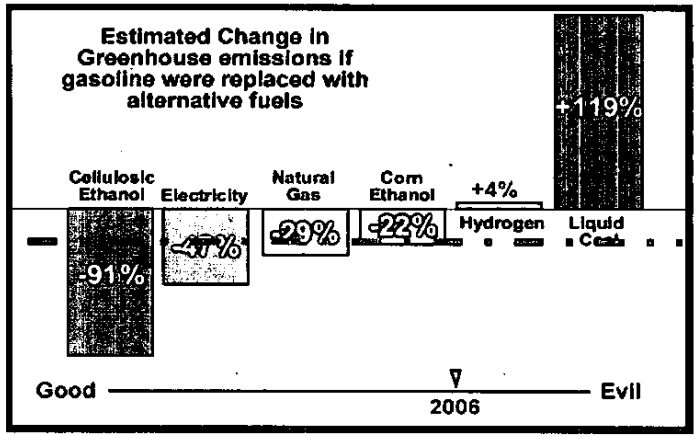


Current CTL or BTL Technology Issues

- **Relatively Expensive**
- **Low Thermal Efficiency**
- **Non Optimal Product Mix**
- **GHG Emissions Well Above Oil-Based Refining**
- **Biofuel Option Requires Very Large Crop Land Area**

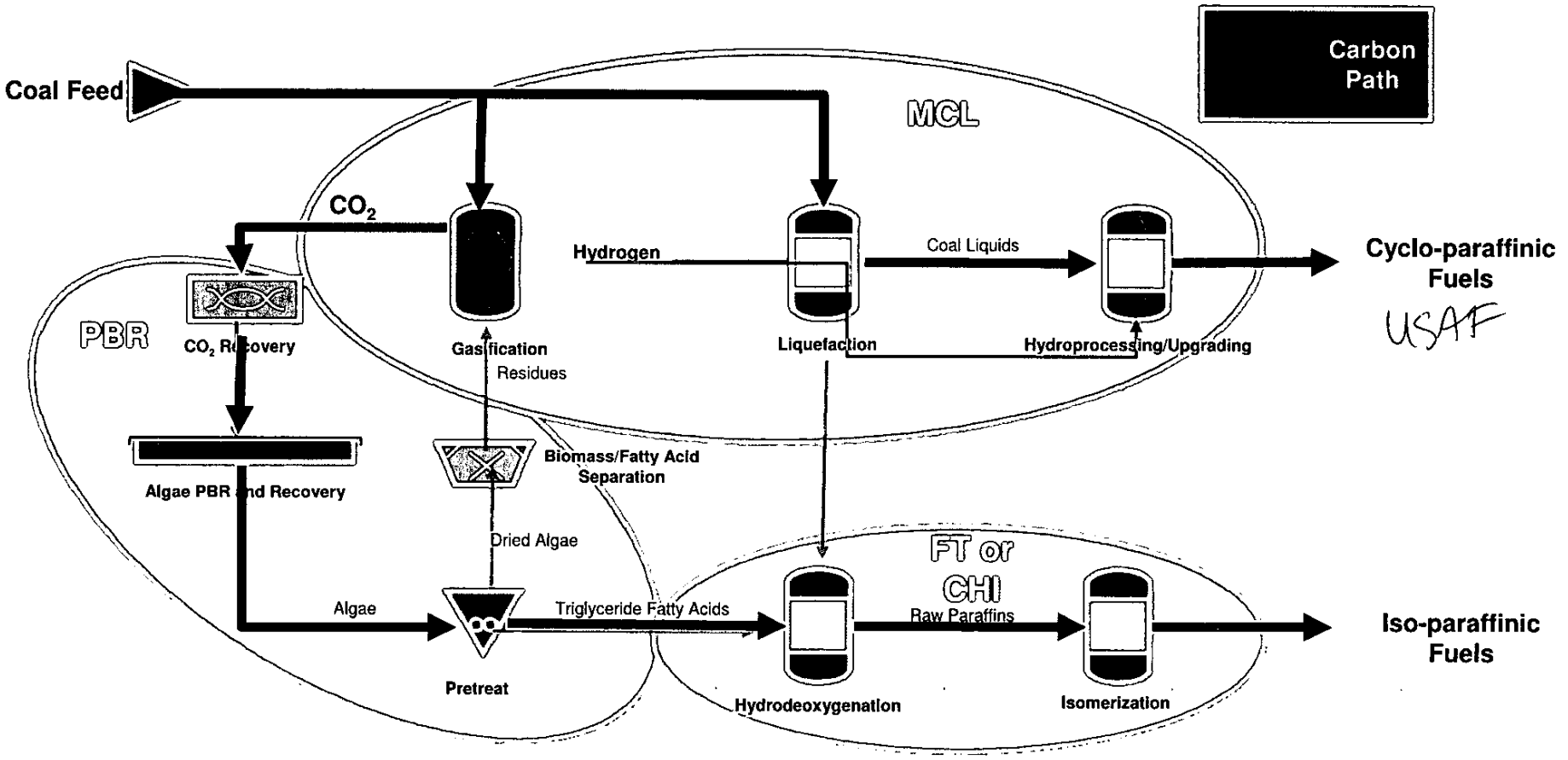
Accelergy's Advanced ICBTL Achieves

- *80+% Overall Energy Efficiency*
- *< 10% of BTL Land Area Requirements*
- *Section 526 GHG Requirements*
- *Cost Competitiveness with Today's Crude Oil*



Accelergy ICBTL Overview

ICBTL with Carbon Capture & Recycle – A Strategic Option for Future Fuel Production

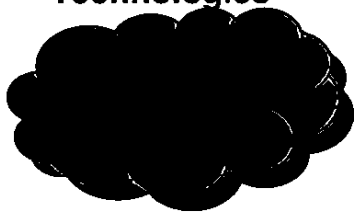


Process CO2 Used for Algae – for Fuels and Terrestrial CO2 Sequestration

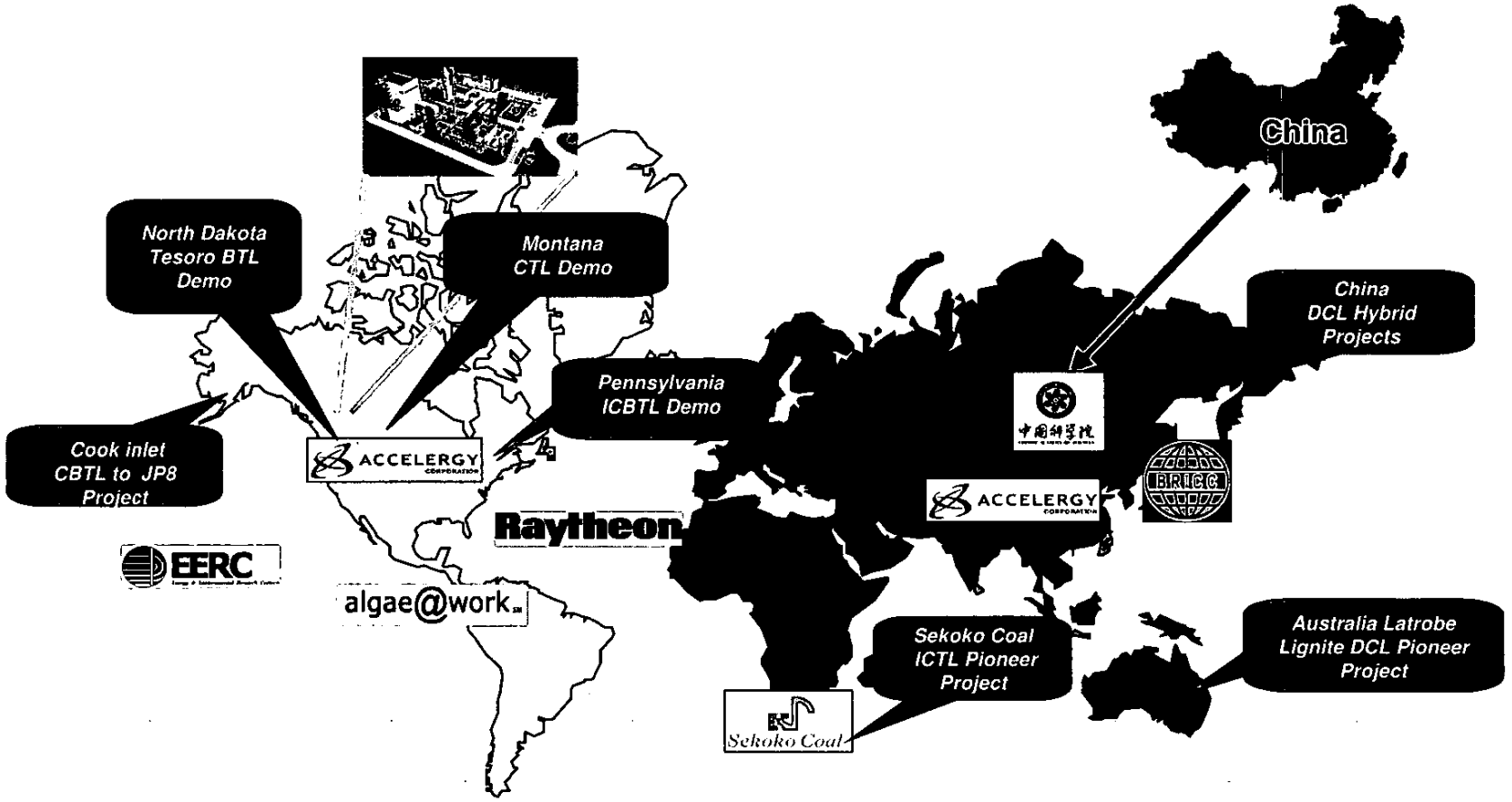
Accelergy's MCL® & ICBTL® Technologies Superior to Other Indirect Conversion Options – Offering Higher Yield and Lower GHG Footprint

1 Ton of Coal

Tons of CO_2

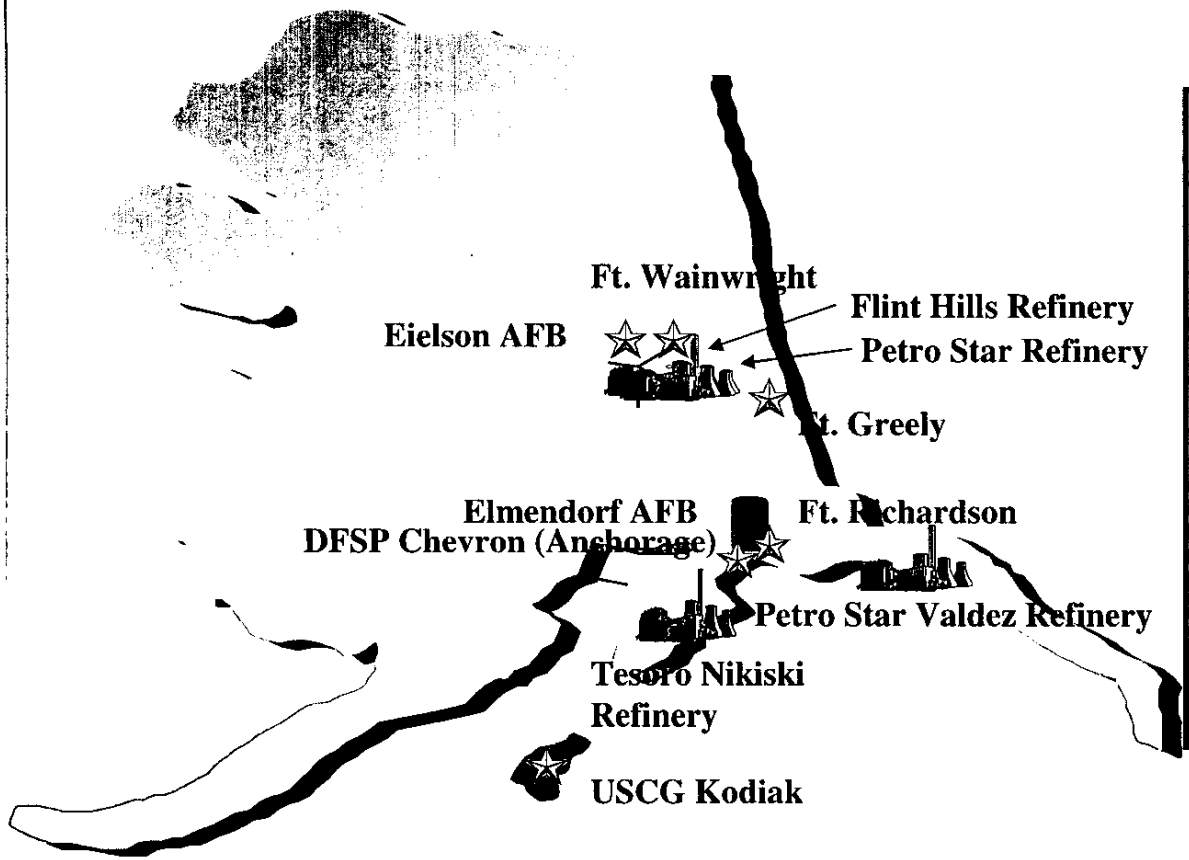
	Conventional CTL Technologies	ACCELERGY MCL®	ACCELERGY ICBTL®
			
	1.6 Tons CO2	1.0 Tons CO2	<0.5 Tons CO2
Barrels of Liquid Fuels			
Products	High GHG Footprint with Low Yield of Gasoline, Diesel and Jet Fuel	Low GHG Footprint with Higher Yield of Gasoline, Diesel and Jet Fuel	CO2 Capture/Conversion for Highest Yield of Gasoline, Diesel and Jet Fuel

Accelergy Alliance Pursuing Global Opportunities for Integrated Coal-Biomass to Liquids



low cost jet fuel

Alaska's Jet Fuel Requirements Provide an Ideal Market for ICBTL



Bulk Fuel Annual Requirements

Location	Product	Volume (gallons)
ANG Kulis Fld (Anchorage)	JP8	2,500,000
Eielson AFB	JP4	50,000
(*)	JP8	22,000,000
Elmendorf AFB	JP8	42,000,000
Fort Greeley	JP4	500,000
Fort Richardson	JP4	200,000
	JP8	200,000
Fort Wainwright	JP4	1,000,000
	JP8	300,000
USCG Kodiak	JP5	3,800,000

(*) Source Mark Iden DESC - Requirements currently under separate Eielson AFB Coal-To-Liquid Initiative

Anchorage International Consumes Over 60000 Barrels Per Day of Jet Fuel

F-35

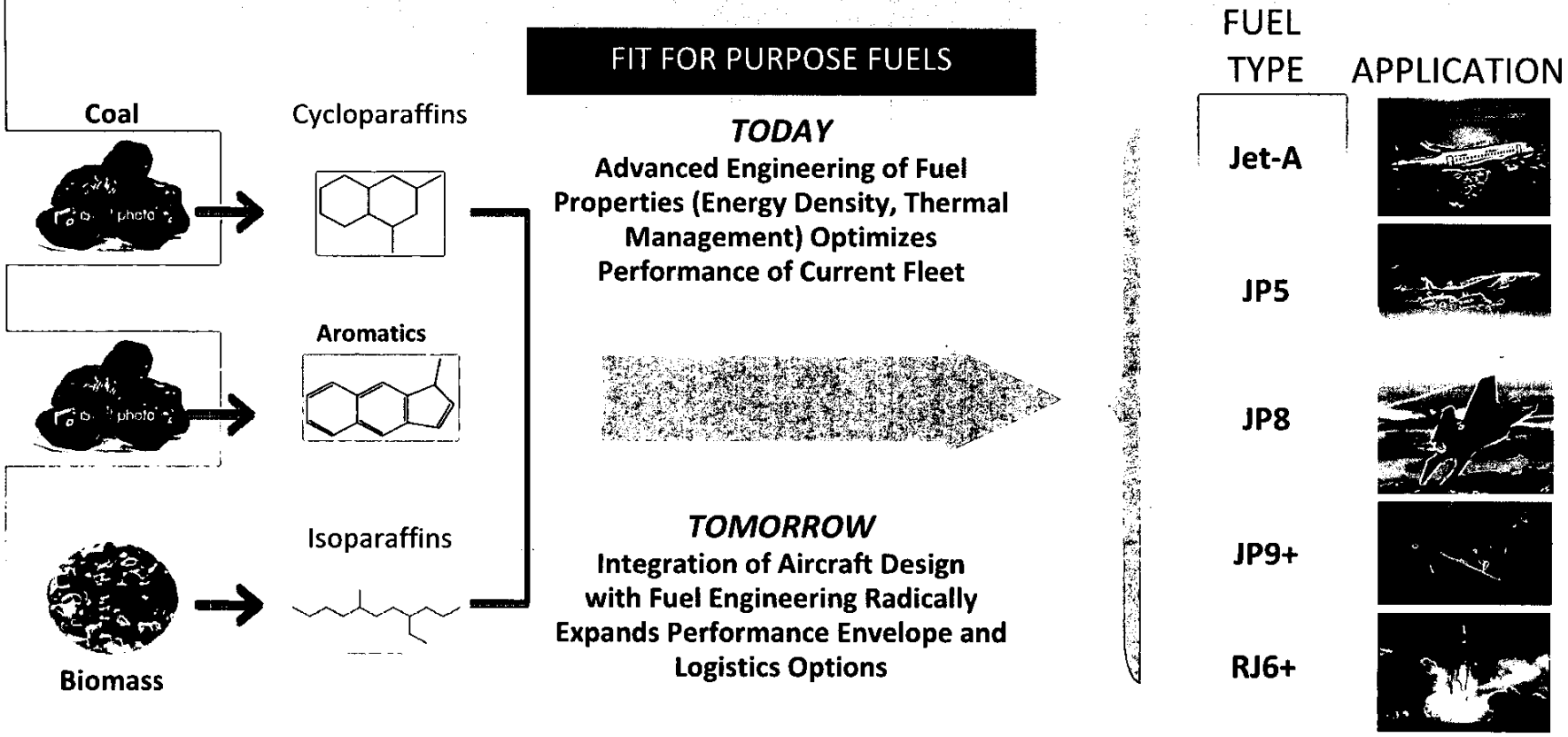
Accelergy-EERC Produced CHI and MCL Liquids Meet Critical Military JP-8 Specifications

Fuel Property	JP-8 (MIL-DTL-83133F Spec)	CHI Jet	MCL Jet
Color, Saybolt	No limit	Clear, colorless	Clear, colorless
Aromatics, vol%	25.0 max.	<19	0.9
Sulfur, wppm	3000 max.	nil	< 1ppm
Density, g/cc@ 15°C or	0.775–0.840	0.805	0.840
Flash Point, °C	38 min.	48	45
Freeze Point, °C	–47 max.	–60	–64
Naphthalene, vol%	3.0 max.	0.00	0.00
HV, BTU/lb	18,400 min	18,500	18,550

Larger Scale Tier 2 Test Program Being Discussed with DOE/DOD/USAF Research Laboratories

EERC
Energy & Environmental Research Center®

Fit-for-Purpose Fuels: A Win-Win for Accelergy and the USAF



Oxidative Stability Test of JP-8

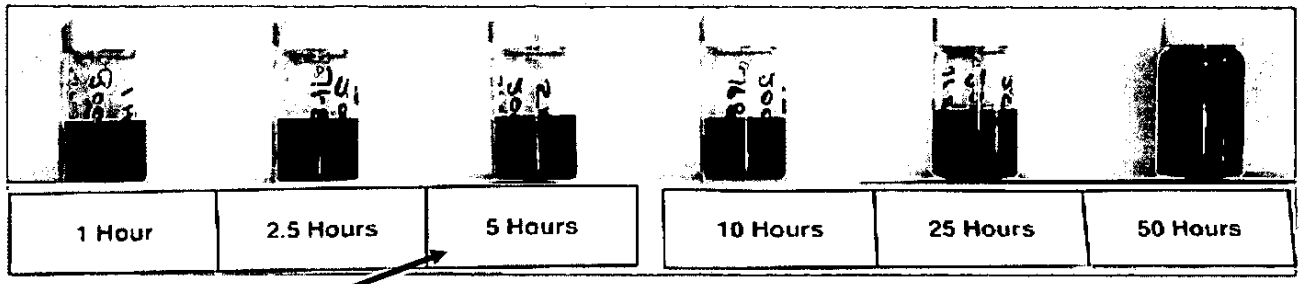


Figure 4-6: Photograph of the JP-8 fuel samples collected from the heating mantle oxidation at 200° C at periods of 1hr, 2.5hrs, 5 hrs, 10 hrs, 25 hrs, and 50 hrs

JP-900 Passes 5hr Test

Oxidative Stability Test of JP-900

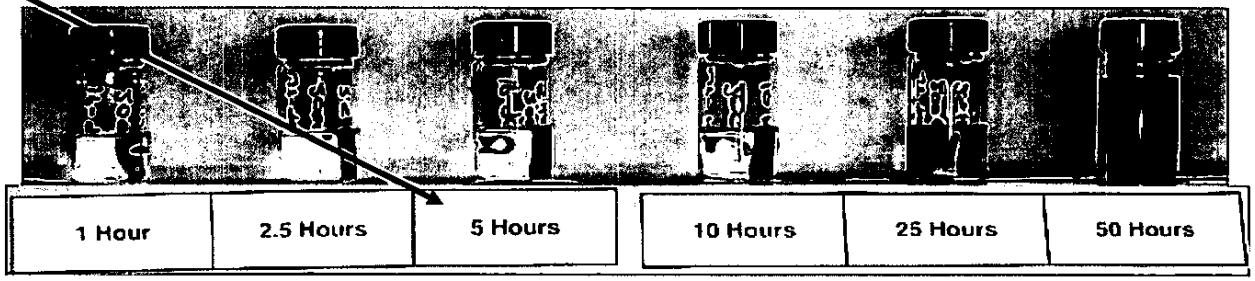


Figure 4-5: Photograph of the fuel samples collected from the heating mantle oxidation of JP-900, POSF-4765, at 200° C at periods of 1hr, 2.5hrs, 5 hrs, 10 hrs, 25 hrs, and 50 hrs

Source: H Schobert et al Penn State 2002

AFRL Test Program to Certify Accelergy Fully Synthetic JP8 Sec 526 Fuels

AFOSR
AIR FORCE OFFICE OF SCIENTIFIC RESEARCH

The Air Force Office of Scientific Research discovers, shapes, and champions basic science that profoundly impacts the future Air Force.

2009 Fuel Test Program

1Q10 *– JP8 Tier 1 Production in EERC*
2Q10 *– AFRL Tier 1 Testing*
4Q10 *– EERC RCLU Program Launch (Pending Tier 1 Findings/FY2010 Earmark Request)*

USAF JP8 Test Program Requires Progressively Larger Samples

TIER	TEST DESCRIPTION	SAMPLE VOLUME
I	Screening	0.25 gal
II A	Specifications Conformance	
II B	Lubricity	
II C	Low Temperature Properties	2 gals
II D	Extended Chemical/Physical Analysis	
II E	Material Compatibility Properties	
II F	Combustion Test	25 gals
II G	Thermal Stability Testing	

Testing Programs Performed Under Standard USAF Secrecy Criteria and Materials Testing Agreements

Producer State Compact Home

General Update – Accelergy Military Fuels Programs

- **$18M in program support from Federal/State Sources**
  - $8.0M DOD Grant under Title III of the Defense Production Act
    - To build and operate advance bio-refinery (see next page)
  - $8.0M DOE directed funding from the Energy & Water Appropriations Bill
    - ICBTL Demonstration Project in Montana
    - Demo-scale coal and biomass refinery located outside Billings
    - Engineering to begin Q2, 2011
  - $1.25M DOE Earmark
    - Dedicated DCL processing unit at EERC
    - Unit under construction – start-up February 2011
  - $350K Pennsylvania New Energy Project
    - 1st Draw of potential $10M for fully integrated demo program
    - Demonstration ICBTL with Carbon Capture and Recycle
    - Partnership with Raytheon Corporation and Siemens

First Demo

- **Fully Synthetic Jet Fuel Program**
  - Active program with the Air Force Research Labs/TARDEC under CRADA's
  - Multiple samples submitted and tested through Tier II
  - Currently producing optimal sample for Tier III testing
  - On schedule for new standard development in early 2013

$800 barrel pioneer project

2197

The 3 defense Project - Sen Backus

Update - 1st Commercial Bio-Refinery Plant in Collaboration with Tesoro

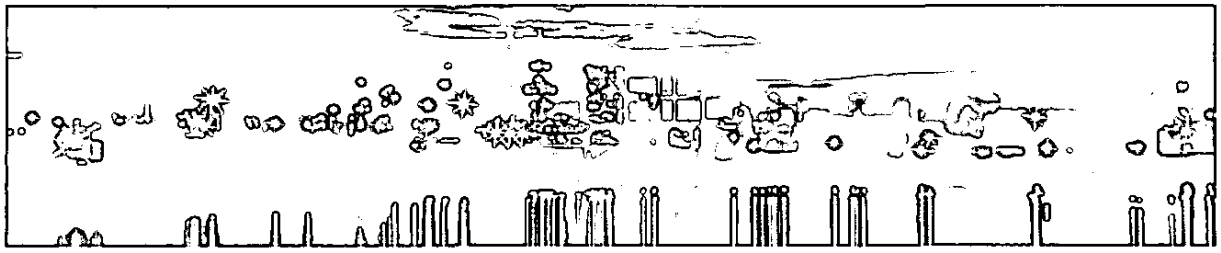
ADVANCED TACTIAL FUELS MANDAN BIOMASS REFINERY

- 100 Barrel/day (1.4M gallons/year) bio-refinery plant
  - Funded under Title III of the Defense Production Act (DOD)
- Co-located at the Tesoro Mandan Refinery
  - 60,000 B/D refinery plant located in Bismarck, North Dakota
- Primary feedstock – Camelina Oil
  - Other anticipated feeds – algae oil, waste grease, soy oil
- Output – Iso-paraffinic distillate for HP jet, diesel & gasoline
  - Sales to Defense Logistics Agency & Tesoro
- Worley Parsons – primary engineer
  - Front end engineer & design (FEED) package complete – December 2010
- Construction Schedule
  - Commence construction – March 2011
  - Startup – February 2012

20 year military contract purchase agreement

TESORO

EERC



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China Programs/Potential Partners in Alaska

Continued Progress in China Commercial Development

Commercial Discussions Progressing

Multiple Development Partner Discussions

神华集团有限责任公司
SHENHUA GROUP CORPORATION LIMITED

中国大唐集团公司
China Datang Corporation

Yanzhou Coal Mining Company Limited
EXCELLENT BRAND OUTSTANDING CREDIBILITY

Agreement to examine hybrid opportunities

中科合成油技术有限公司
SYNFUELS CHINA

let's go to China

Government and Technical Advocacy Established

Construction of pilot unit scheduled for 1Q 2011

BRICC

Coal verification and support agreement

中国科学院 上海分院
CHINESE ACADEMY OF SCIENCES SHANGHAI BRANCH

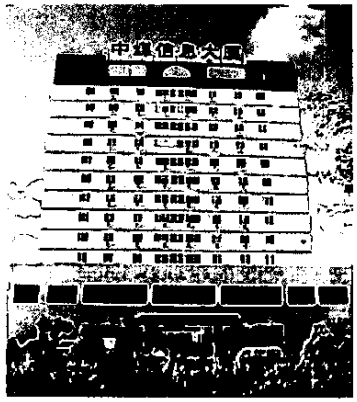
Multiple other reach out programs established (e.g. NDRC, MOST, Xinjiang)

Response and support suggest aggressive development program

1.2 billion

Accelergy Beijing Micro-Catalytic Direct Liquefaction Pilot Plant

- Project agreement developed and executed with Beijing Research Institute of Coal Chemistry (BRICC)
  - One-half Barrel/Day Direct Liquefaction Unit
  - Located at the BRICC's Beijing Headquarters
  - Leveraging an existing direct liquefaction pilot unit
- Phase 1 – USAF Production
  - Full production run to produce 10 barrels of DCL distillate
  - Upgraded in the United State
  - Production commences November 2010
- Phase 2 – Integration of MCL Reactors
  - Upgrading of pilot facility with MCL plug-flow reactors
  - Continued production of DCL distillate for USAF
  - Production commences March 2011
- Phase 3 – 3rd Party Coal Performance Confirmation
  - Processing of third party coals
  - Confirmation of performance for Chinese coal chemistry companies
  - Program to start in the Summer of 2011



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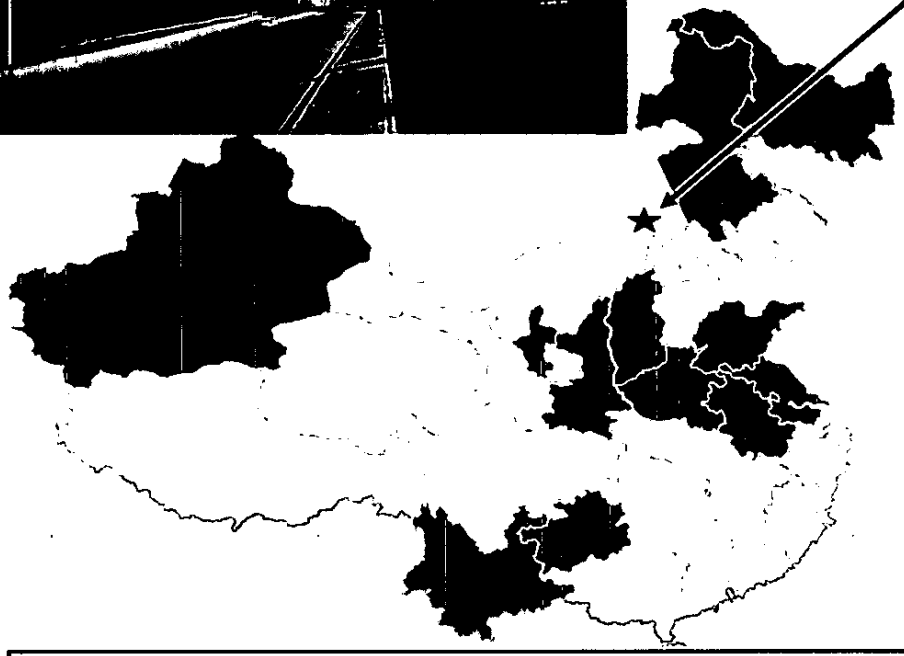
Northeastern China FT Plant

Representative Project – Hybrid Retrofit of Existing Plant



Yitai Coal-to-Liquids Plant

- **4,000 barrel/day Coal FT Plant**
- **Commissioned April 2009**
- **Erdos, Inner Mongolia**
- **Synfuels China FT Technology**
- **Product Sales Price - $50/barrel**
- **$400 million Construction Cost**

HYBRID RETROFIT ECONOMICS

- 5,000 B/D incremental capacity
- Capital cost of $300M
- Accelergy Capital - $60M
- Accelergy Cash Flow - $40M annually

Several Chinese Partners Interested in Offshore Options Including Alaska Cook Inlet

220

Accelergy – State of Pennsylvania Programs Provide A Good Model for Cook Inlet ICBTL

2203

Commercial Projects Must Meet Technical – Regulatory – Economic Targets

State of Pennsylvania New-Energy Project Requirements Are Illustrative

Pen. Coal Use

Energy Security

- **Utilizes Domestic Resources**
- **Sustainable Use of Land, Water and Process Feedstocks**

MIT

Environmental Responsiveness

- **Avoids need for CCS** — expensive
- **Section 526 GHG**
- **High Thermal Efficiency**
- **Beneficial Use of CO2**
- **Consumes Waste Coal and Coal Bed Methane**

Carbon capture - Recycle

Economic Viability

- **At Crude Price Parity** — High Ash content
- **Does Not Need Tax or Price Subsidies**
- **Provides Secure Jobs**

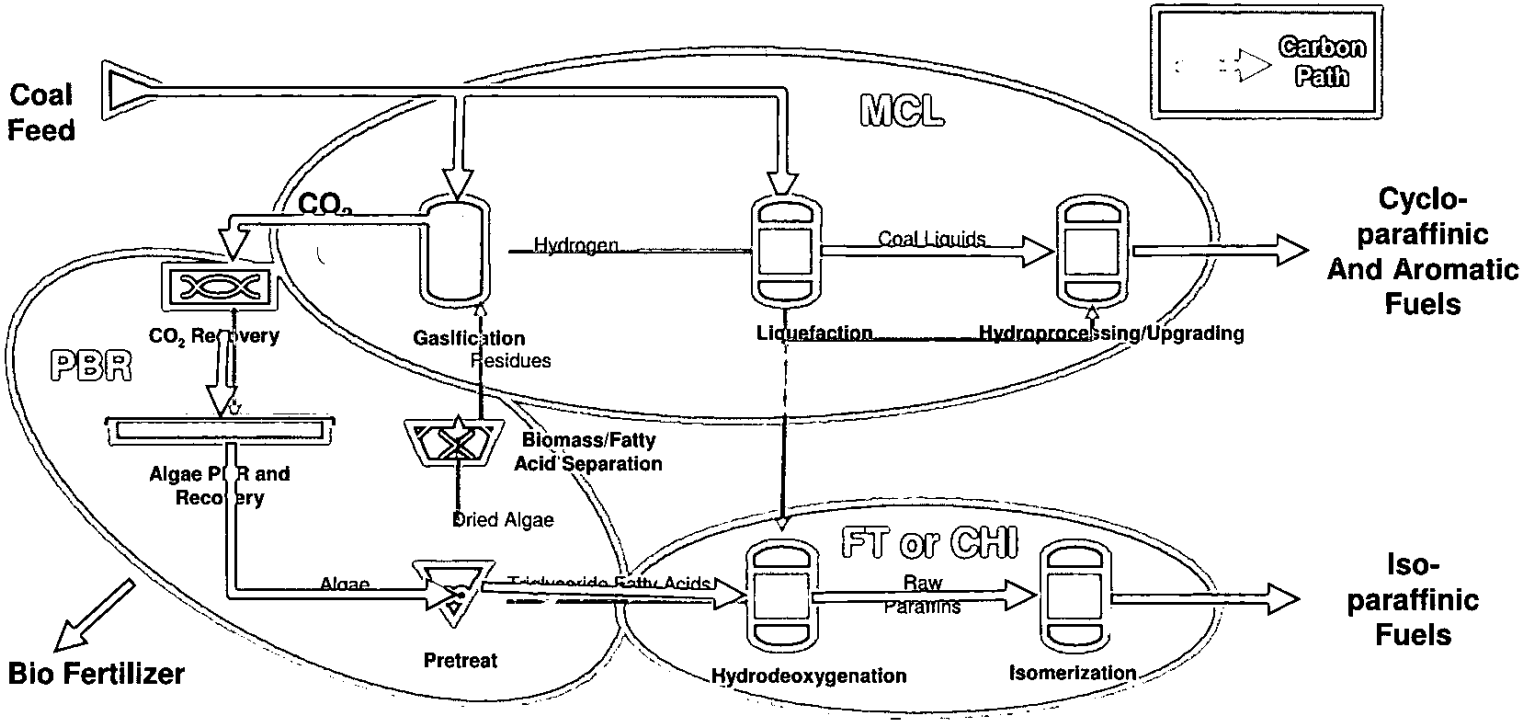
25% more energy to bury CO^2

Pennsylvania's Major Objectives for Pioneer ICBTL Project

- Establish a "Truly Clean" Coal Industry Utilizing State Resources
- Mitigate Susquehanna Watershed Waste Water Problems via Bio Fertilizers
- Maximize the Utilization of Waste Coal
- Achieve CO2 Mitigation via Algae TerraDerm® Bio Fertilizer for Terrestrial Sequestration
- Produce Transportation Fuels for PA and Fully Synthetic JP8 for DOD
- Produce Secure Domestic Jobs/Creates New Industrial Base

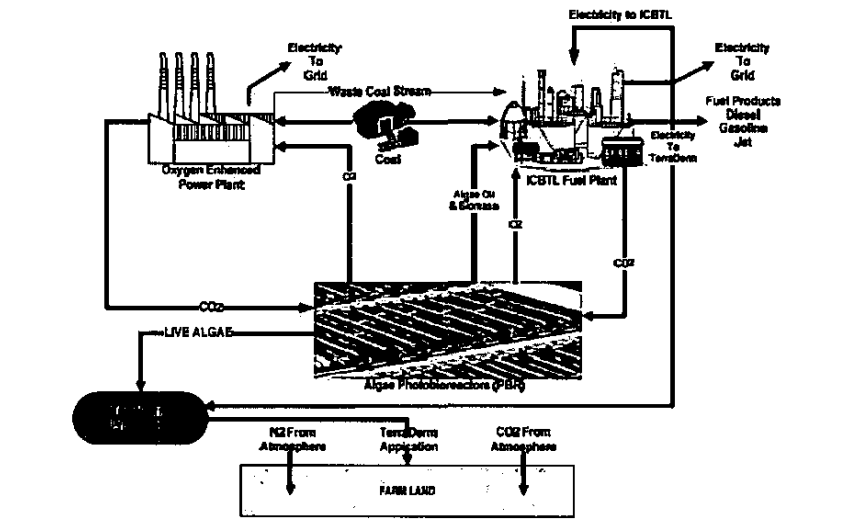
Waste Coal Project - Seward - Reliant Company!

Pennsylvania ICBTL Demo Project Includes Carbon Capture & Recycle



- *Process CO2 Used for Algae – for Fuels and Terrestrial CO2 Sequestration*
- *Initial Flow Scheme to Include MCL Coupled with PBR – TerraDerm*
- *Camelina and/or Coal Derived Syngas to be Used for Iso-paraffin Production*
- *System to Produce Fully Synthetic JP8 for DOD Applications – 20 Year DOD Purchase Agreements Offered in Pending Baucus-Tester Energy Bill*

Pennsylvania Interested in ICBTL Power Plant Co-location



ICBTL Plant Configured with Stand Alone Power Plant – Produces 50,000+ Barrels Per Day Fuel While Capturing CO2 to Sustain Farm Based Fertilizer While Meeting Section 526 Requirements

Accelergy Alliance Confidential

- **Commercial PA ICBTL Plant to Be Co Sited with Existing Power Plant in Western PA**
  - Seward 500MW Waste to Power Plant
  - Mansfield 2.6GW PC Power Plant
  - Close Proximity to Pittsburgh No 8 or High Sulfur Bituminous Feedstocks – Alpha Cumberland Mines
- **State DEP and Department of Agriculture to Assist in Project and Environmental Permitting**
  - Carnegie Mellon, U Pittsburgh and Penn State Assisting with Process, Environmental and Econometric Modeling
- **Secure 50% Financing via State Bonds – Low Interest Loans Via DOE CCS Project Finance RFP**
  - Use DEP/McGinty Approach to Seward Financing
- **Prequalification for ExxonMobil to be Achieved with Foster Wheeler, Bechtel and/or Siemens**

Pennsylvania Commercial Project - Notional Schedule Based on Seward Experience

- Feasibility Study/EM Prequalification	2010- 2011
- Pre-FEED/FEED/Permitting	2012
- EPC	2012- 2015
- Shakedown/Start-up	2016

ICBTL Project Economics/Impacts

Notional 8KBD Facility – 2000 TPD DAF Coal Feed
Assumes Coal Validation Studies Completed with Pre-Qualification

Program Phase	Total Jobs	Duration	Total Cost
Feasibility Study	5	3 months	$350K
Pre-Qualification	15	3 months	$1.5 million
Resource Validation Program	30	24 months	$10+ million
Pre-FEED/FEED	~100	24 months	$60-70 million
EPC	2500	36 months	~$800 million
Operation	1000 (250 direct)	30 years	~$150 million/yr

Projected Savings on US Foreign Oil Payments
(Assuming $80/B Oil) = $9 Billion Over 30 Year Life of Project

ICBTL Jobs and Economic Development Potential is Significant

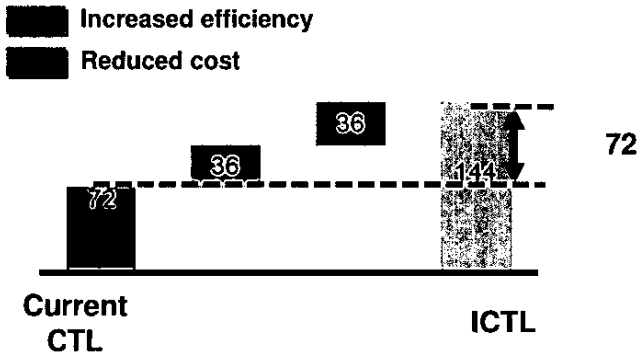
Personnel Analysis for 8000B/D Liquefaction Plant with Terra Derm (2010 Accelergy Adjusted 2005 DOE Reference Case)

Type of Job	Wages $/hr	Number of Employees	2010 Annual Payroll
DIRECT PERSONNEL			
Plant Operations			
Plant Operators	$28.68	185	$11,067,512.20
Shift Supervisor and Computer Control Operators	$32.78	45	$3,076,682.93
Machine Operators	$24.59	29	$1,487,063.41
Lab Technicians	$18.44	29	$1,115,297.56
Labor Experienced	$20.49	58	$2,478,439.02
Labor Common	$14.34	58	$1,734,907.32
Maintenance			
Labor Mechanic - Repairs	$30.73	29	$1,858,829.27
Labor Electronic - Repairs	$30.73	29	$1,858,829.27
			$24,677,560.98
INDIRECT PERSONNEL			
Central Office	$24.59	58	$2,974,126.83
Technical Support & Marketing			
Sales Personnel	$61.46	58	$7,435,317.07
Architectural	$81.95	29	$4,956,878.05
Technical Service	$61.46	58	$7,435,317.07
Warehouse	$24.59	35	$1,794,731.71
			$24,596,370.73
	Total Employees	700	
	Total Payroll		$49,273,931.71
	Average Salary		$70,391.33

Note: Pro Rata Screening Study Results from DOE 2005 Liquefaction Study. More Detailed Analysis of Potential Alaska and Pennsylvania Projects Will be Required To Develop Site Specific 2013+ ICBTL Cases.

Accelergy ICTL® Creates Substantial Value While Significantly Reducing GHG Footprint

Value Created by Accelergy ICTL
Profit (US$) from 1 Ton of Dry Ash Free Coal



If 1% of the world's coal reserve is converted into fuels over a 30-year period using Accelergy ICBTL instead of current CTL technologies

Produce Two Times More Fuel Each Year or $16Billion Worth of Domestic Energy

Accelergy – Tyonek – Alaska Path Forward

ICBTL for Coal/Biomass Conversion to Synthetic Jet Fuel
Major Objectives for Cook Inlet Project in Local – Asia Pacific Export Markets

Energy Security – **Anchorage International and USAF Alaska Fuel Demand Sufficient to Justify a World Class ICBTL Facility in Cook Inlet**

Energy Sustainability – **Distillates, Bio-oils and Synthetic Crude Can Provide Supplemental Feeds and Blend-stocks for Existing Alaskan Refineries – Cook Inlet Coal Resources Sufficient to Provide Fuels For Many Decades**

Environmental Responsiveness – **ICBTL Meets Section 526 GHG Requirements – Produces Useful Sulfur and By-product Coal Solids for Industrial Application – Minimizes Water Usage Per Barrel of Fuel Product – Provides Alternative to CCS for Power Plant GHG Mitigation via Terra Derm Synthetic Bio-Fertilizer**

Economic Viability – **Preliminary DOE/DOD Studies Define Wide Range of Business Opportunities for Cook Inlet Coal Conversion – Ability to Create Secure and Attractive Jobs for US – Superior Economics to All Known CTL Alternatives**

Accelergy - Tyonek CBTL Program - Path Forward

Developed MOU on Tyonek Coal/Biomass to 100% Synthetic Jet Fuel Program

- Resource Assay – Permitting – Land Use Assessment
- Joint Development Program Funding Initiatives
- Joint Approach to Elmendorf AFB and Anchorage International

Initiate Joint Program on Tyonek Tier 1/2 Test Program with AFRL/TARDEC

- KL Gates Assistance with Alaskan and Lower 48 Senate Staff
- Explore State of Alaska and USAF/DESC/DOD Options
- Develop CRA Proposal on 100% Fully Synthetic JP8
- Explore Full Range of Beluga CBTL Options with DOD/DESC/USAF

Collaborate with Crow on Many Stars Education and Technology Training

- Held Face to Face Meeting in 1Q'2010
- DC Meeting on Congressional Funding for Coal States (AK, MT, ND, PA)
- Seeking Agreement in Principle from University of Alaska on Environmental Test Facilities for MT Demo Program

ACCELERGY - TYONEK ENTERPRISE DEVELOPMENT – NEXT STEPS

- **Site specific study on Beluga coal at Tyonek Tribe selected site - $250K**
  - Definition of Process Basis
  - Lab testing of Beluga coal
  - Develop heat and material balance for plant
  - Determine investment and operating cost
  - Develop project economics
  - Establish a test program to demonstrate Tyonek Project design
- **Tyonek Coal Assay/MCL Pretreatment/Autoclave Process Study - $320K**
  - Analysis of preferred coal feedstocks
  - Lab scale testing of pretreatment methods
  - Parametric studies to define optimum MCL autoclave process conditions
  - Production of MCL distillates for preliminary characterization studies
- **Bench Scale Production and USAF Tier 1-2 Testing of Tyonek JP8 and JP8+100 Samples - $430K**
  - Large scale autoclave production of MCL distillate
  - Distillate upgrading to JP8 and JP8+100 samples for Accelergy and USAF testing
  - USAFRL testing of JP8 and JP8+100 for Tier 1 certification
  - Determine investment and operating cost

Accelergy Alliance Proposed 50/50 Cost Allocation with Tyonek Group to Complete Beluga MCL Study and Product Certification