IH$^{2®}$ Technology:
Journey to Commercialization

CAAFI Meeting
Washington DC, 26 October 2016

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Integrated Hydropyrolysis & Hydroconversion

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Agenda Points

- Shell Commitment
- What is $IH^{2®}$ Technology?
- Product Quality
- Life Cycle Analysis
- Demo Progress
- Certification & Approvals Process

Shell New Energies

Future of Transport
A range of factors are changing the transport sector …

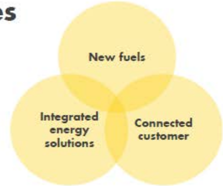
Increasing demand for energy and transport

Climate change and air pollution

New technologies available

New transport policies

New Energies
Exploring new opportunities



- Winning company in the energy transition
- Established credentials: exploring options

New fuels

- Cleaner transportation
- Biofuels + hydrogen

Integrated energy solutions

- NL + USA wind
- Solar for enhanced oil recovery in Oman

Connected customer

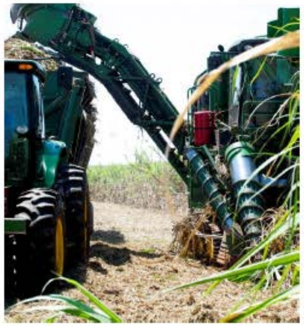
- Connected mobility
- Connected energy

New Fuels

http://reports.shell.com/investors-handbook/2015/integrated-gas/new-energies.html

GTL

Pioneering Gas to Liquid (GTL) technology



Biofuels

Conventional & advanced biofuels

Hydrogen

Active in hydrogen electric

Electricity

Exploring a role in the charging of EVs

What is IH$^{2®}$ Technology?

Feedstock agnostic
Flexible process, integrate with refinery, pulp mill, etc
Continuous catalytic thermochemical process
Produces hydrocarbon transportation fuels
Gasoline, Jet and Diesel

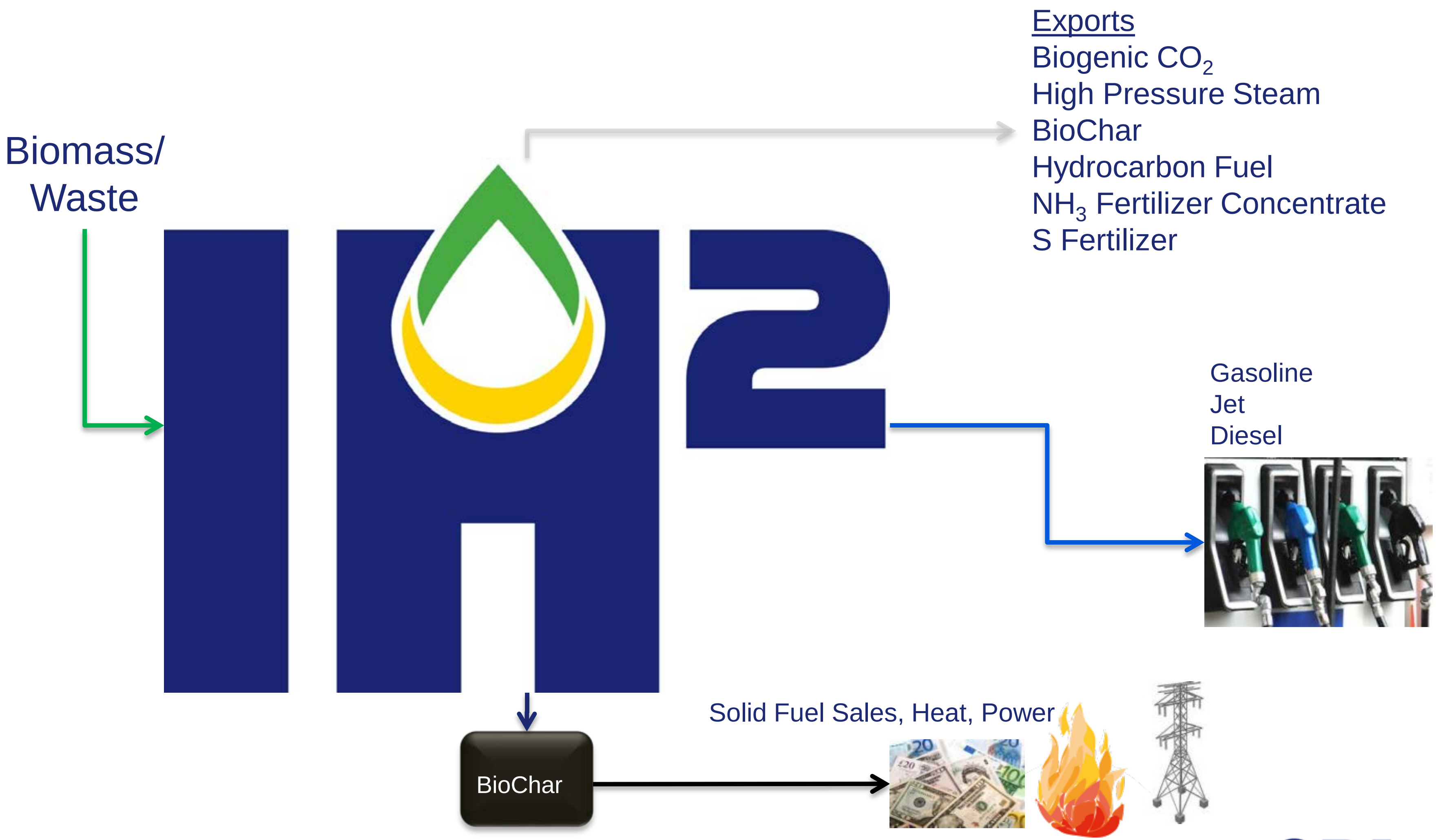
Transformational

An Overly Simplified View

IH^{2}® technology takes only minutes to achieve what Nature requires millions of years to

But it does her one better by providing *refined* fuel

At 100,000 Feet…



Product Quality

High quality hydrocarbon transportation fuels
Gasoline, Jet and Diesel
Meet ASTM Road Transport Specs
Meet Jet A/A-1 Specs

‘Drop In’ Replacement Fuels

US - Gasoline
- **Meets ASTM D4814-16d**
- 86/87 Octane w/ E15
- S < 10-ppm
- Fully renewable (CA)RBOB

EU – Petrol
- EN 228: Petrol – Jan 2009
- RON 87 vs 95
- S ~10-ppm
- **Blend Stock**

World-wide Civil Jet Fuel Grade
- **Meets Jet A/A-1 Specs**
- S < 2-ppm
- Freezing Point BDL
- No napthalenes
- Low aromatics – CPK
- Ability to allow aromatics

US - Diesel
- **Meets ASTM D975-15c**
- Cetane Number 44
- S < 10-ppm

EU Diesel
- EN 590:2009+A1:2010
- Cetane Number 48
- S <15-ppm
- **Blend Stock**

A Picture is Worth…

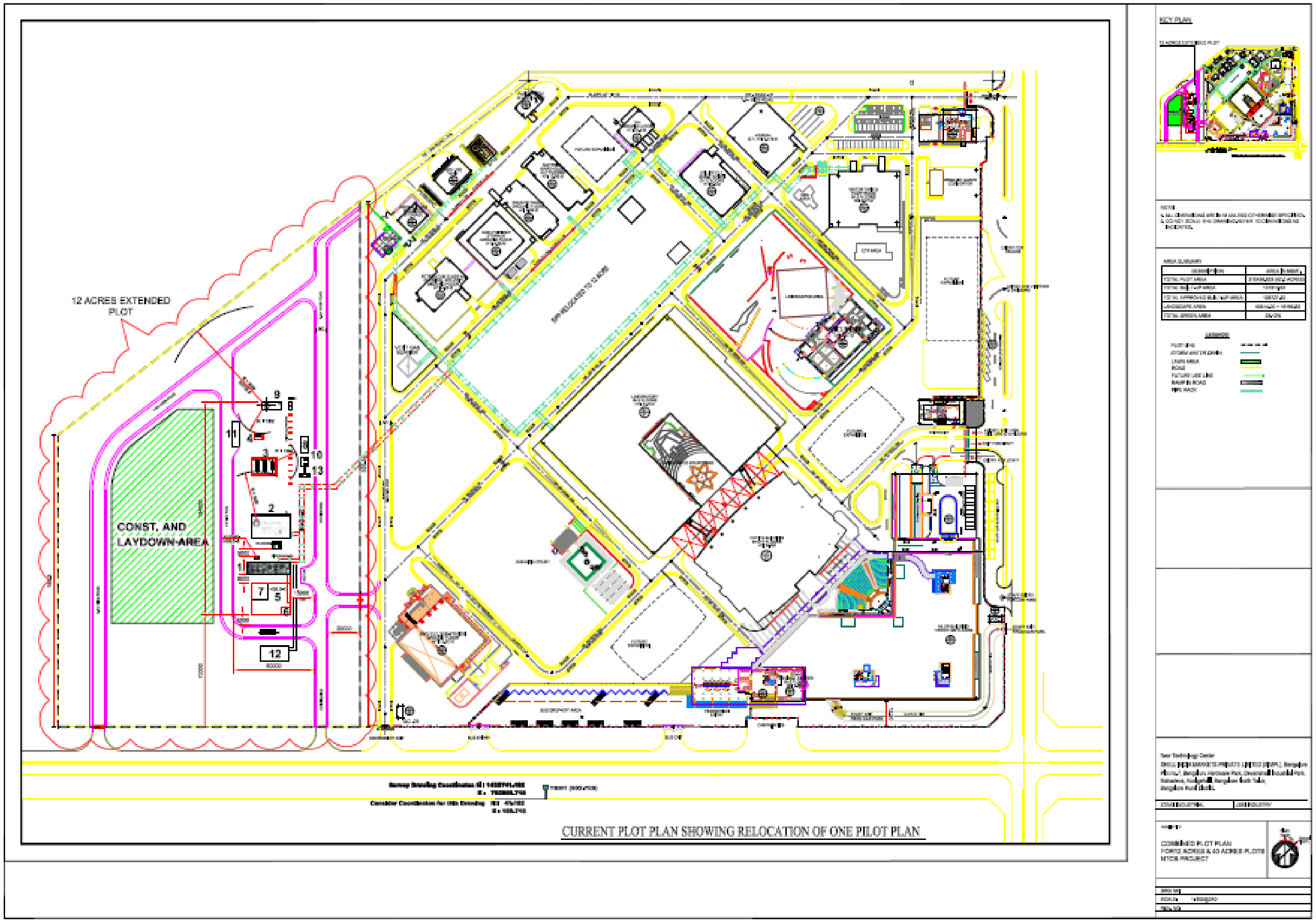
Life Cycle Analysis

In all cases GHG reduction >60%
Can be as high as 86.4% processing MSW

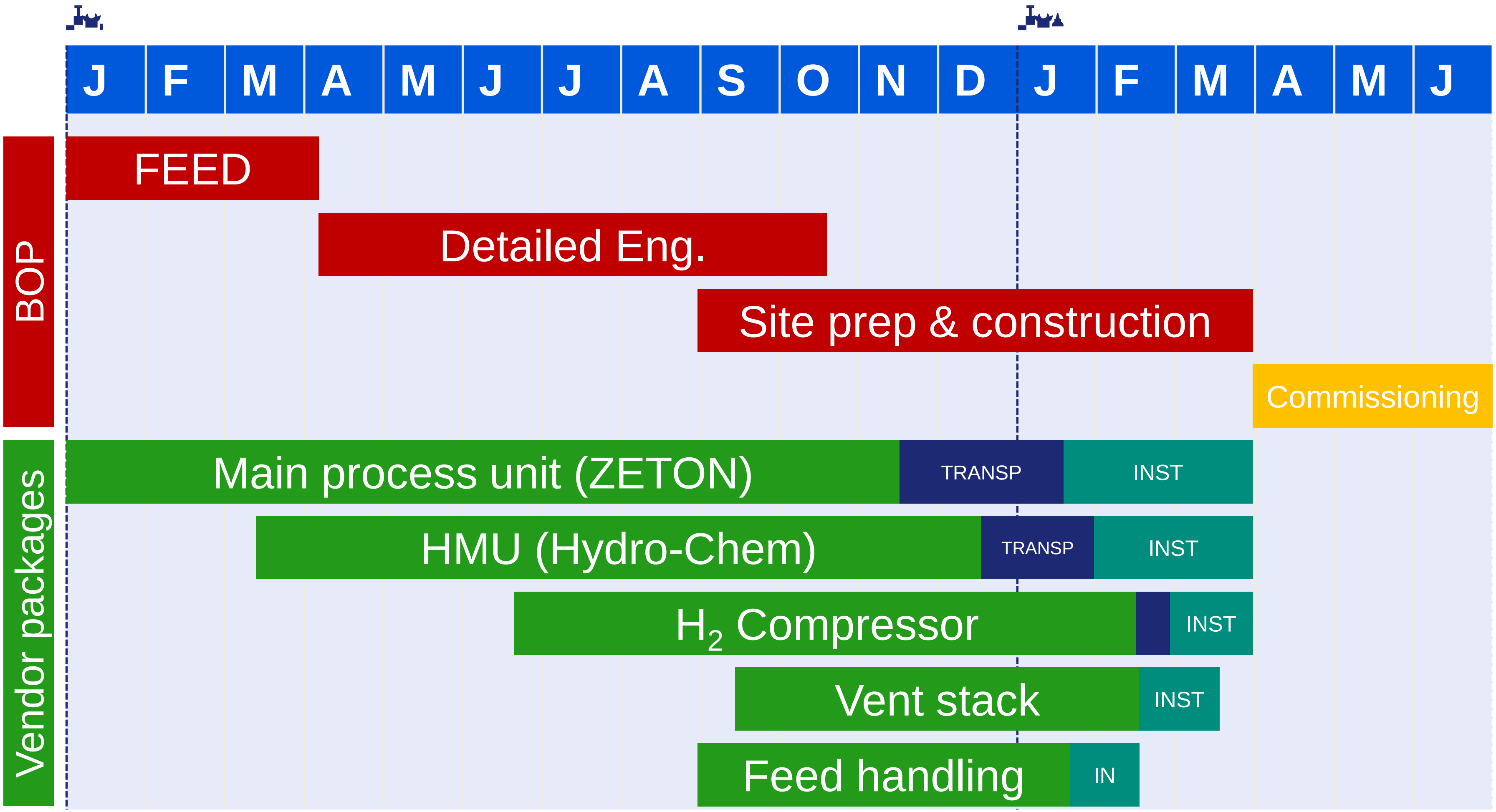
Demo Progress

Invention by GTI in 2009
Joint development proceeding with CRI since 2010
~7000 hours pilot testing since 2012
Scaled up particle sizes from multi micron to multi mm
Scaled up process from mL/d to 20L/d
5 tonne MAF feedstock/day scale (2000L/d)
On target for commissioning end Q1 2017
Demonstrates critical process elements
All equipment commercially proven

IH^2-5000 Demo location Shell Bangalore



IH2-5000 current high level timeline



IH^2-5000 Zeton Skid (10/19/2016)

Fuels Certification & Registration

2014-2016	500 gallons of TLP produced at GTI on IH²-50 pilot
1H17	EPA engine screening tests Light & Heavy Duty @ SwRI; Initial jet fuel screening
3Q17+	IH²-5000 demo TLP production
4Q17	Light & Heavy Duty EPA Testing @ SwRI
1H18	Submit SwRI engine test results to EPA
2H18	Large volume jet blend for aircraft testing
2H18+	EPA registration response; Continued jet program

Jet approval under ASTM D7566 (50/50 blend)
Petrol approval under ASTM D4814-16d (E10 blend)
Diesel approval under ASTM D975-15c (neat)

EPA Pathway M (gasoline) and L (jet and diesel)
RINs D3 (gasoline) and D7 (jet and diesel) US market sales

Thank You

Learn more at
http://www.cricatalyst.com/catalysts/renewables.html

http://www.businesswire.com/news/home/20160105005277/en/IH2-Technology-Licensed-Leading-European-Company

http://www.businesswire.com/news/home/20151211005791/en/IH2-Technology-Demonstration-Plant-Built

http://www.businesswire.com/news/home/20150330006277/en/IH2-Technology-Licensed-Leading-Global-Forest-Products*

Jeff McDaniel
CAAFI conference, October 2016

Smaller scale gas- and biomass-to-liquids
A commercially available route for airlines to fulfil renewable fuels commitments

VELOCYS

Velocys

The company at the forefront of smaller scale gas-to-liquids (GTL) and biomass-to-liquids (BTL)

- **Leader** in smaller scale GTL and BTL
  - 15 years and >$300 million invested in product development
  - Exhaustive and proven patent protection
- First class **partners** offering a **complete solution**
- **Commercial roll-out underway**
- One of the largest dedicated development teams in the industry
  - Commercial center in Houston, Texas; technical centers near Columbus, Ohio and Oxford, UK
  - Permanent pilot plant in Ohio, USA

Construction complete at ENVIA Energy's GTL plant

The GTL / BTL process using Fischer-Tropsch

For the production of high value products

Reforming

Fischer-Tropsch (FT)

Hydro-processing

Natural gas or landfill gas

Syngas
(carbon monoxide + hydrogen)

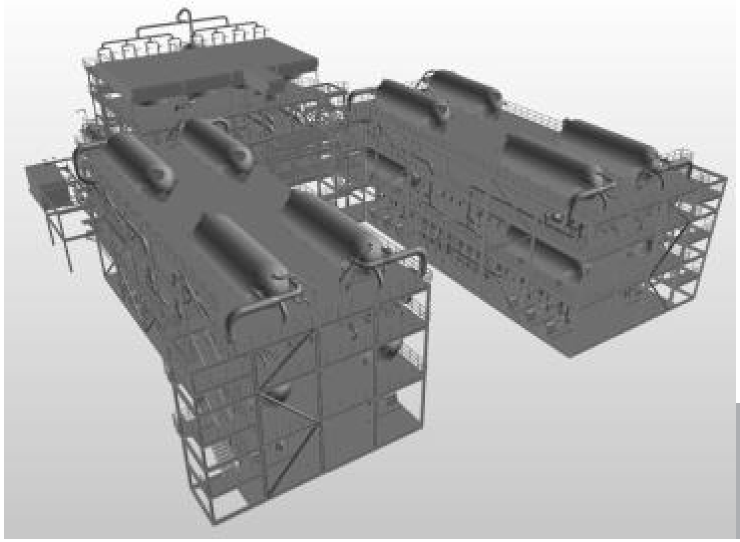
"Syncrude"

Premium fuels & chemicals
(diesel, jet fuel, waxes, etc.)

Products are renewable if using landfill gas or biomass as feedstock

Gasification

Biomass



Smaller scale GTL/BTL.
The FT section of a plant

Construction complete at ENVIA
World's first commercial renewable FT facility

ENVIA Energy Oklahoma City project - status

Renewable fuel credentials

- **Construction complete**
- Pre-commissioning substantially complete
- **Commissioning underway**
  — Ensure each process system in sequence is working robustly, safely & within specification to best assure successful, safe, uneventful start-up
- **Renewable feedstock (landfill gas)** co-fed with pipeline natural gas
- Portion of fuels produced will generate Renewable Identification Number **(RIN) credits**

ENVIA Energy Oklahoma City project
Increased involvement for Velocys

- February 2016, Velocys gained
  - — **Greater equity stake** in the project
  - — **Greater influence** in commissioning, start-up & operations of the plant
- Highly-skilled Velocys managers, engineers & operators on site under secondment agreement with ENVIA
  - — **Considerable experience** in GTL plant start-up, commissioning and performance optimisation
  - — **From operating commercial large-scale GTL plants** (and VPP)
  - — Serving under ENVIA Plant Manager until permanent operations team phased in as planned

Roger Harris, Senior Manager, Operations and Technology Commercialisation

Johan Malan, Commissioning Manager

Red Rock Biofuels
US DoD sponsored BTL

- **16 MMGPY** biomass-to-liquids (BTL) plant
- Located in Oregon, USA
- Will use forestry waste as feedstock
- Licensed plant agreement signed with Velocys
- FEED study complete
- **Southwest Airlines** & **FedEx to each offtake** 3 million gal/yr of jet fuel from the plant
- Supported by US Department of Defense and US Department of Energy
  - — $4.1m phase 1 grant for engineering
  - — **$70m construction grant**
- Targeting **final investment decision in 2016**

Velocys FT jet fuel versus specification

Supporting delivery of drop in jet fuel – ASTM D7566 for neat synthesized paraffinic kerosene (SPK) component

Physical property	Units	Velocys FT SPK	Specification	Meets spec.
Specific gravity at 15ºC	kg/l	0.76	0.73-0.77	✓
Flash point	ºC, min	>38	38	✓
Freeze point	ºC, max	-47	-40 (Jet A)	✓
Sulphur	% mass, max	<5	15	✓
Carbon & hydrogen	% mass, min	>99.5	99.5	✓
Composition	% max, aromatics	0.5	0.5	✓
	% max, cycloparaffins	<15	15	✓
	% paraffins	90%	Report	✓
Metals	ppm	Nil	0.1 ppm each	✓

Fuel specifications met by FT jet fuel

- Meets Jet A and Jet A-1 for synthesized paraffinic kerosene (SPK)
  - Must be blended with conventional jet fuel at a maximum of 50%
- **"Drop in" replacement** for petroleum derived fuels, lubricants and other products
- FT route to jet fuel from municipal solid waste **reduces lifecycle greenhouse gas emissions by ~70%**
- Align with airline industries need and desire to tackle CO_2 emissions and sustainability
- United Airways, Cathay Pacific, Southwest Airlines, FedEx all content with the at-wing solution that FT jet fuel can deliver

Renewable Fischer-Tropsch jet fuel projects

- Velocys and partners are developing renewable FT projects
- **Plentiful, low cost biomass** feedstocks available
  - — Landfill gas
  - — Woody biomass and agricultural residues
  - — Municipal and industrial waste
- FT fuel products **meet all required specifications**
- **Velocys** provides **enabling technology**, **operational expertise** and other key resources to enable industry growth

Thank you

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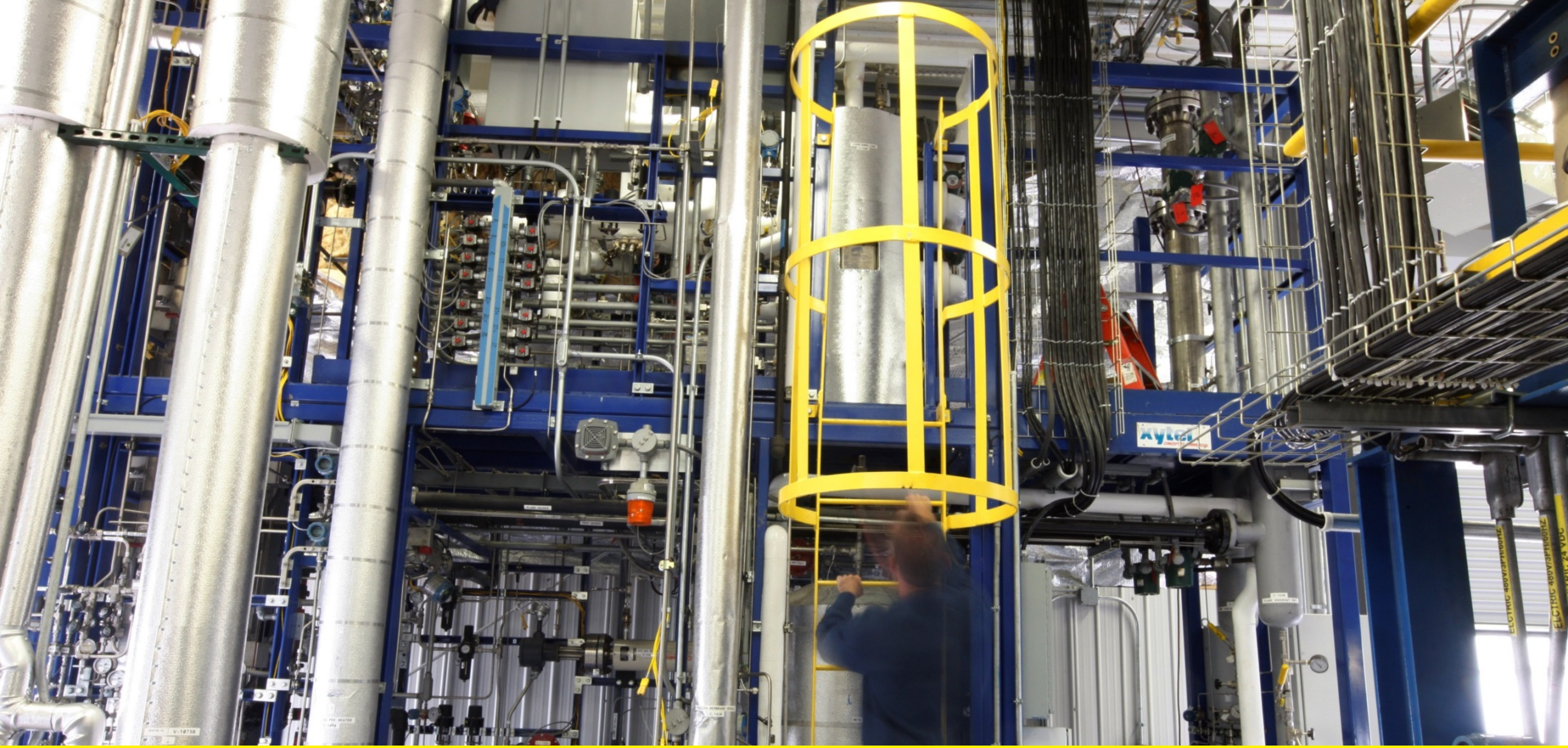


Think Smaller

VELOCYS

Commercialization of Aviation Biofuels

CAAFI Biennial General Meeting, Washington DC

Dave Cepla
Jim Andersen

October 26, 2016

Honeywell UOP

Commercial Renewable Aviation Biofuels… Now a Reality

United Airlines is first commercial airline in U.S. to use renewable jet fuel on regular scheduled flights

Fuel provided by AltAir Fuels in first dedicated commercial production of HEFA SPK renewable jet fuel

Honeywell UOP Technology Produces First Commercial Volumes of Aviation Biofuel

Drop-in Renewable Fuels from Honeywell UOP

Plant-derived Oils
Animal Fats & Grease
Used Cooking Oil
Algal Oil

Ecofining™ Process or
UOP Renewable Jet Fuel Process

Honeywell Green Diesel™

Honeywell Green Jet Fuel™
(HEFA SPK)

TheDigest
2015
Advanced Bioeconomy Awards

Process of the Year:
Honeywell's UOP Green Fuels Technology

WBM Bio Business Award Winner 2015

PLATTS GLOBAL ENERGY AWARDS
Industry Leader Award Biofuels
Honeywell UOP LLC

ACS Chemistry for Life®
HEROES of CHEMISTRY

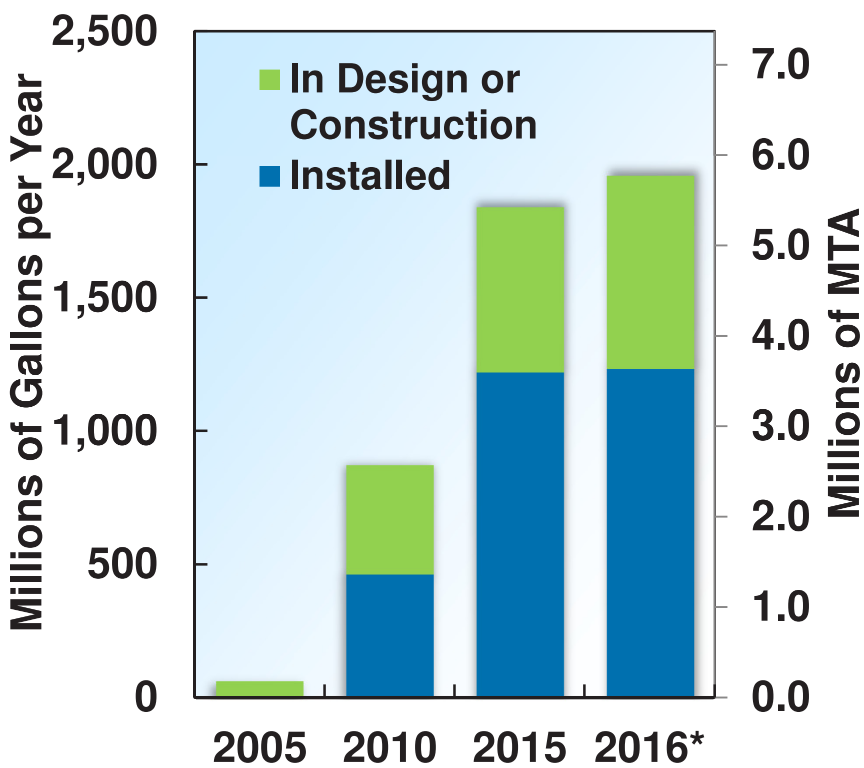
Honeywell Green Jet Fuel™
2016 Heroes of Chemistry Award

Proven Technologies for Feedstock Flexible Drop-in Fuels

Honeywell
UOP

Progress Producing Renewable Fuels

Worldwide Capacity for HEFA type Renewable Diesel/Jet



* as of October 2016

- HEFA SPK is being commercially produced using Honeywell UOP technology and is in use in regular commercial flights
- Commercial offtake agreements
- Substantial capacity has been installed for HEFA type fuels
  - 3.7% of global biofuels demand
  - 0.2% of global diesel & jet fuel demand
  - Predominantly diesel
  - Additional capacity under design or construction
- Five aviation biofuels currently approved by ASTM International
- Additional aviation biofuels are being tested under ASTM
  - Includes testing by Honeywell of expanded HEFA

Growing supply but more capacity is needed

Expanding Feedstocks
for Renewable Diesel/Jet Fuel Production

UOP participation in Feedstock Programs:

- USDA
  - Redesigned Oilseed Feedstocks for HEFA SPK
- Collaborations on developing and testing of new feedstock pathways
  - Algal oils
  - Cellulosic
- Biofuel Producers, Project Developers, & Feedstock Suppliers:
  - Support for oilseed crop commercialization
  - Approval of new feedstocks

Focus on expanded utilization of sustainable & economic feedstocks

Summary

- There are four types of biofuels produced today in large commercial volumes but only one that is currently approved for aviation fuel
  - Ethanol (not suitable for aviation)
  - FAME Biodiesel (not suitable for aviation)
  - HEFA Renewable Diesel (potentially suitable for aviation)
  - HEFA SPK Renewable Jet (approved for aviation)

- Honeywell UOP technology for producing HEFA SPK has been commercialized and costs of production have been reduced as expected
  - Ground transportation fuels currently offer greater incentives for producers and this must be overcome to expand the supply of renewable aviation fuels (ICAO CORSIA)

- New types of feedstocks will emerge as the demand for HEFA continues to increase
  - Must be economically competitive and sustainable

Honeywell UOP

LanzaTech

CELEBRATING 10 YEARS

From Mill to Wing: Alcohol to Jet

Dave Meyer
Business Development Manager

The Carbon Imperative

Energy can be Carbon free

Wind

Solar

Hydro

Liquid Fuels & Chemicals must contain

Efficiency Recycle C

Be Carbon Smart!

From Waste to Wing

=

Lanzanol

Flight will provide fuel performance data to help accelerate ASTM certification of ATJ production pathway

Ethanol → Dehydration → Oligomerization → Hydrogenation → Fractionation → ATJ-SPK Diesel

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

virgin atlantic

Pacific Northwest NATIONAL LABORATORY

首钢朗泽 Shougang LanzaTech

BOEING

HSBC

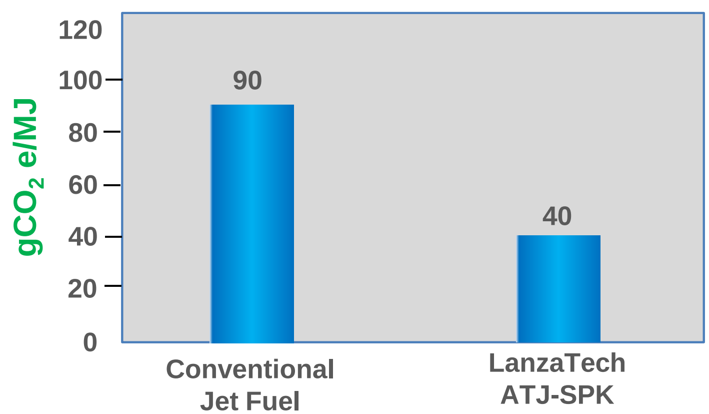
LanzaTech capturing carbon. fueling growth.

Recycling Gases: Environmental, Economic, Social Benefit

Water Recycle

No Land Biodiversity

Life Cycle GHG Emission



Life Cycle Analyses (LCA) for ethanol and jet fuel performed in cooperation with: Michigan Tech University, Roundtable on Sustainable Biomaterials (RSB), E4Tech, Ecofys and Tsinghua University

50-70% GHG Reduction over Petroleum Jet Fuel

Provides new revenue stream from waste materials

Provides energy security from sustainable, regional resources

Provides affordable options to meet growing demand

Provides economic development that creates "green jobs"

LanzaTech ATJ Production Status

- ✓ **4000 gallons Jet**
- ✓ **600 gallons Diesel**
- ✓ **Properties of neat fuel and 50% blends meet specifications**

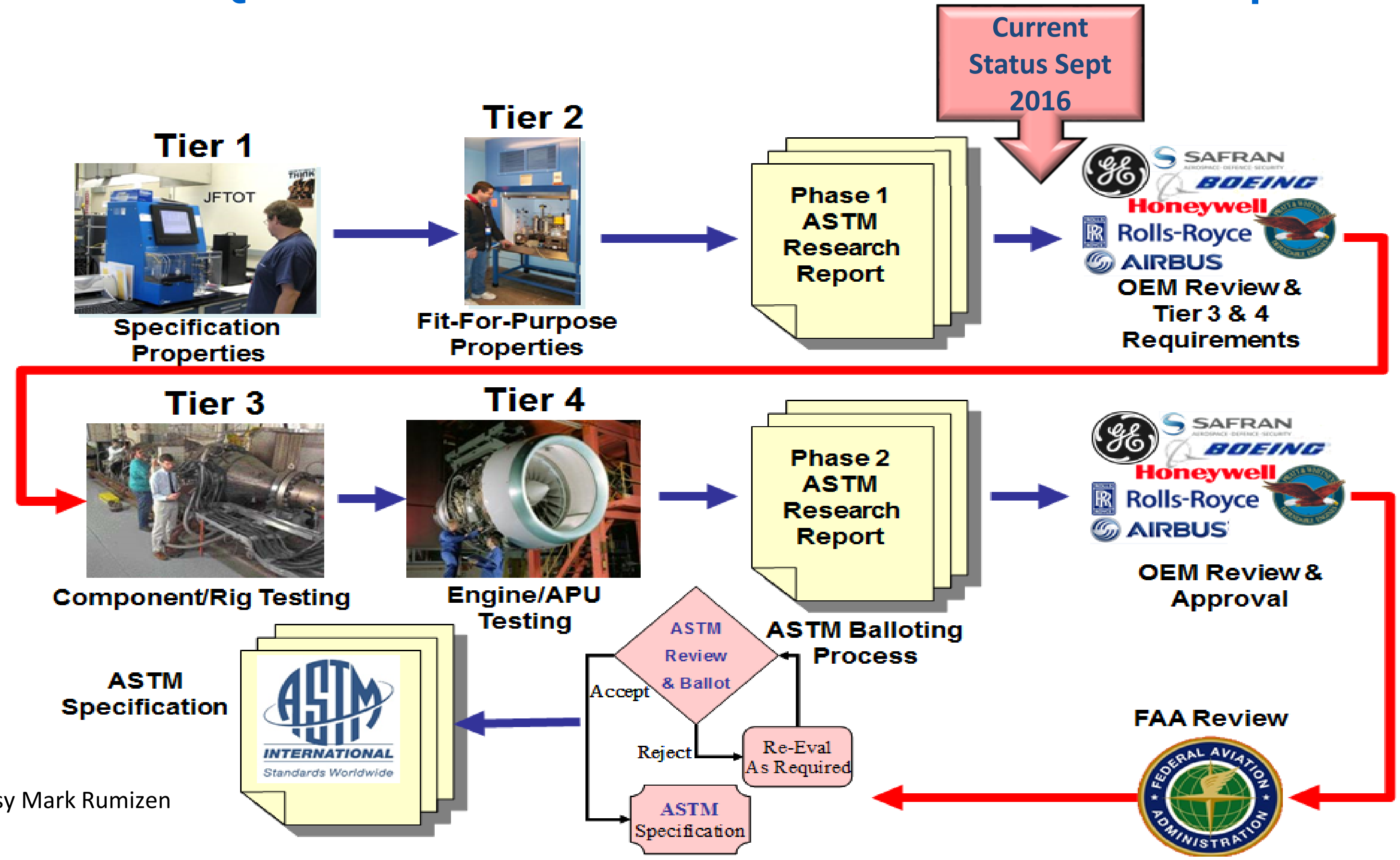
Jet Fuel Production Status

- **Demonstrated feedstock flexibility**
  - 1,500 gal from Lanzanol
  - 2,500 gal from Grain Ethanol
- **Technical feasibility established at demo scale**
- **Lanzanol produced in an RSB-certified facility**
  - Shougang-LanzaTech 100,000 gal/yr demonstration plant in China
- **Phase 1 Research Report submitted September 2016**

Increased Run Time and Production Rate → Improved Product Yield → Reduced Operating Cost → Lower Cost Commercial Product

LanzaTech
capturing carbon. fueling growth.

ASTM D4054 Qualification for New Aviation Fuels- Fit for Purpose Testing



Courtesy Mark Rumizen

FFP Property Testing – Conformance with Conventional Fuels

- ✓ Hydrocarbon #, Type, Distribution
- ✓ Trace Components
- ✓ Bulk Physical, Thermodynamics, Solubility
- ✓ Electrical Properties
- ✓ Ground Handling And Safety
- ✓ Compatibility With Fuels/Additives s, elastomers

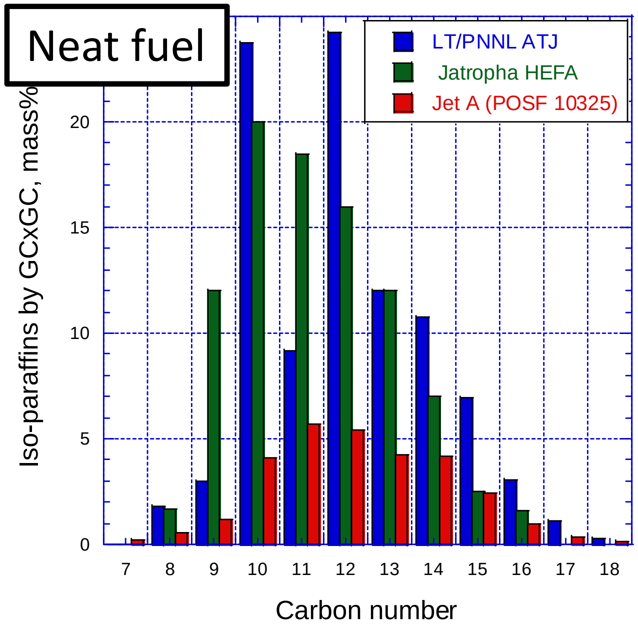
Component And Engine Testing To Ensure No Anomalies

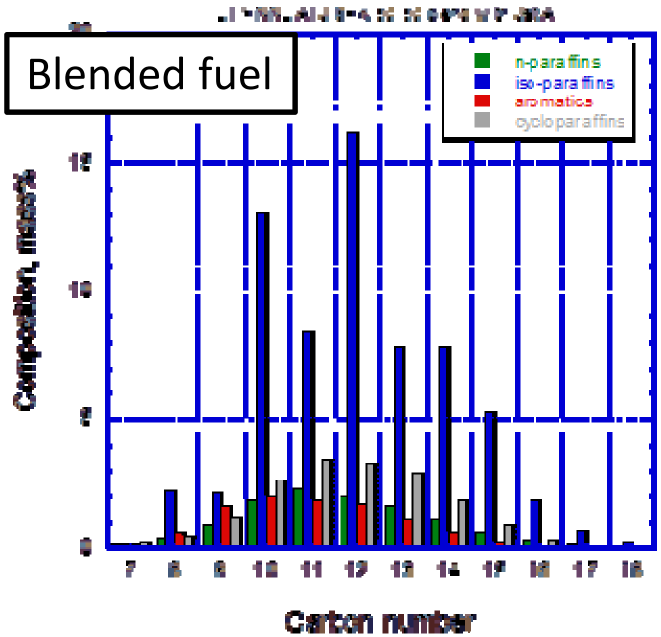
- Turbine Hot Section
- Fuel System, Combustor Rig
- Engine Test At OEM
- Compatibility with Aircraft Parts

- **Test Flight**

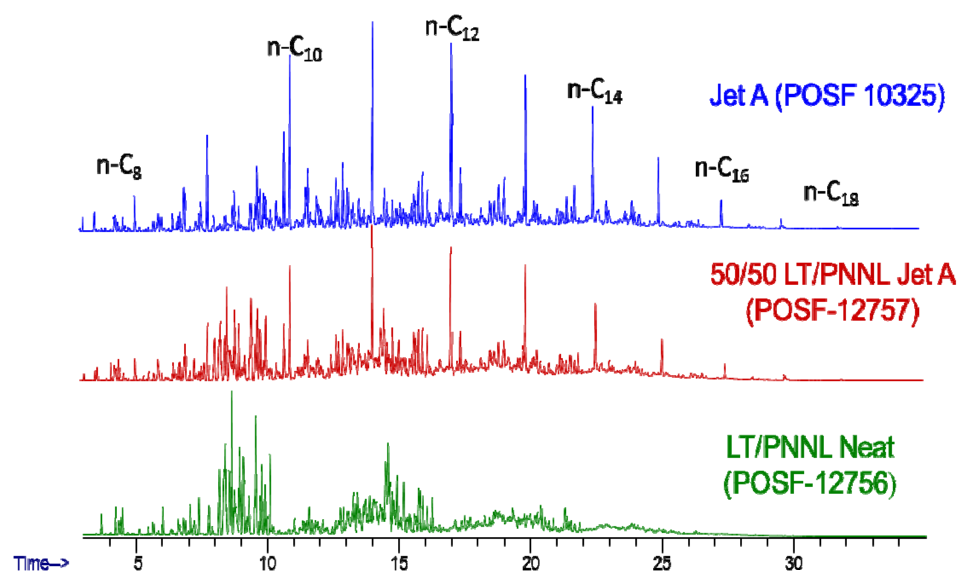
All Future Testing per Guidance from the OEM's

Hydrocarbon Class of Lanzatech Jet Fuel Neat and Blended





	D7566 SPK Spec	Neat ATJ Fuel Lab	GRE ATJ	LZ ATJ Demo	Typical Jet A
D2425 (mass %)					
Paraffins(normal + iso)		**96**	**97**	**97**	**48**
Cycloparaffins	**≤15**	**4**	**3**	**3**	**34**
Alkylbenzenes		<0.2	<0.2	<0.2	12
Indans and Tetralins		<0.2	<0.2	<0.2	3.2
Indenes and C_nH_{2n-10}		<0.2	<0.2	<0.2	0
Naphthalene		<0.2	<0.2	<0.2	0.2
Naphthalenes		<0.2	<0.2	<0.2	2
Acenaphthenes		<0.2	<0.2	<0.2	0.2
Acenaphthylenes		<0.2	<0.2	<0.2	<0.2
Tricyclic Aromatics		<0.2	<0.2	<0.2	<0.2
Total Aromatics	**≤0.5**	**<0.2**	**<0.2**	**<0.2**	**18**



ASTM 7566 Table A5.1 Detailed Batch Requirements for Alcohol to Jet (ATJ-SPK)

Property	Limit	ATJ-SPK spec	ATJ Lab	GRE ATJ Demo	LZ ATJ Demo	ASTM Method	
Acidity, KOH mg/g	Max	0.015	0.008	0.001	0.001	D3242	✓
Distillation Temp, °C 10% recovery ,Temp (T10)	Max	205	172	168	162	D86	✓
50 % recovery, Temp(T50)	None	Report	197	185	185	D86	✓
90 % recovery, Temp(T90)	None	Report	239	221	217	D86	✓
Final boiling point, Temp	Max	300	260	257	240	D86	✓
T90-T10, °C	Min	21	67	53	55	D86	✓
Distillation Residue,%	Max	1.5	1.2	1.1	1.1	D86	✓
Distillation Loss, %	Max	1.5	0.6	0.6	0.6	D86	✓
Flash Point, °C	Min	38	44	42	40	D56	✓
Density @ 15 °C, kg/m^3	Range	730-770	761	763	759	D4052	✓
Freezing Point, °C	Max	-40	<-75	-61	-56.5	D2386	✓
Thermal Stability Temperature , °C Filter pressure , mm Hg Tube Rating	 Min Max Less than	 325 25 3	 >340 0 1	 >340 0 1	 >340 0 1	 D3241	 ✓ ✓ ✓

Both Grain ethanol (GRE) and Lanzanol (LZ) Neat Fuel meet ATJ-SPK specifications

D7566 Table A5.2 Other Detailed Requirements; Alcohol to Jet (ATJ-SPK)

Property	Limit	ATJ-SPK spec	ATJ Lab	GRE ATJ Demo	LZ ATJ Demo	ASTM Method	
Hydrocarbon Composition							
Cycloparaffins, mass%	Max	15	4	3	3	D2425	✓
Aromatics, mass%	Max	0.5	<0.2	<0.2	<0.2	D2425	✓
Parafffins, mass%	None	Report	96	97	97	D2425	✓
Carbon & Hydrogen mass%	Min	99.5	99.5	99.5	99.5	D5291	✓
Non-hydrocarbon Composition							
Nitrogen, mg/Kg	Max	2	0.3	<0.1	<0.3	D4629	✓
Sulfur, mg/kg	Max	15	<1.0	<0.1	<0.1	D5453	✓
Water, mg/kg	Max	75	55	63	20	D6304	✓
Metals(Al, Ca, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, Pd, Pt, Sn, Sr, Ti, V, Zn), mg/kg	Max	0.1 per metal	<0.1 per metal	<0.1 per metal	<0.1 per metal	D7111	✓
Halogens,mg/kg	Max	1	<1	< 1	<1	D7359	✓

Both Grain ethanol (GRE) and Lanzanol (LZ) Neat Fuel meet ATJ-SPK specifications

ASTM 7566 Table 1 Detailed Requirements of Aviation Fuel Containing SPK(50% ATJ/50% Jet A)

Property	Limit	Jet A/A-1 spec	50% ATJ Lab /50%Jet A	50%GRE Demo /50% Jet A	50%LZ Demo /50% Jet A	ASTM Method	
Acidity, KOH mg/g	Max	0.1	0.008	0.002	0.002	D3242	✓
Aromatics, vol%	Max	25	8.7	8.8	8.6	D1319, D6379	✓
Sulfur, mercaptan mass%	Max	0.003	0.000	0.001	0.001	D3227	✓
Sulfur, total mass%	Max	0.30	0.021	0.027	0.027	D5453,D2622	✓
Distillation Temp, °C 10% ,Temp (T10)	Max	205	173	177	173	D86	✓
50 %, Temp(T50) °C	None	Report	201	204	203	D86	✓
90 %, Temp(T90) °C	None	Report	243	244	241	D86	✓
Final boiling point, °C	Max	300	265	270	264	D86	✓
Distillation Residue,%	Max	1.5	1.3	1.2	1.2	D86	✓
Distillation Loss, %	Max	1.5	1.0	0.3	0.1	D86	✓
Flash Point, °C	Min	38	44	45	42	D56	✓
Density @ 15 °C, kg/m^3	Range	775-840	782	782	787	D4052	✓
Freezing Point, °C	Max	-40 Jet A, -47 Jet A1	-58	-51	-51	D2386,D5972	✓
Viscosity@-20 °C mm^2/sec	Max	8.0	4.4	4.7	4.5	D445	✓
Net Heat of Combustion, MJ/kg	Min	42.8	43.3	43.8	43.6	D4809	✓

Both Grain ethanol (GRE) and Lanzanol (LZ) Blended with 50% Jet A meet D7566 specifications

ASTM 7566 Table 1 Detailed Requirements of Aviation Fuel Containing SPK(50% ATJ SPK/50% Jet A)

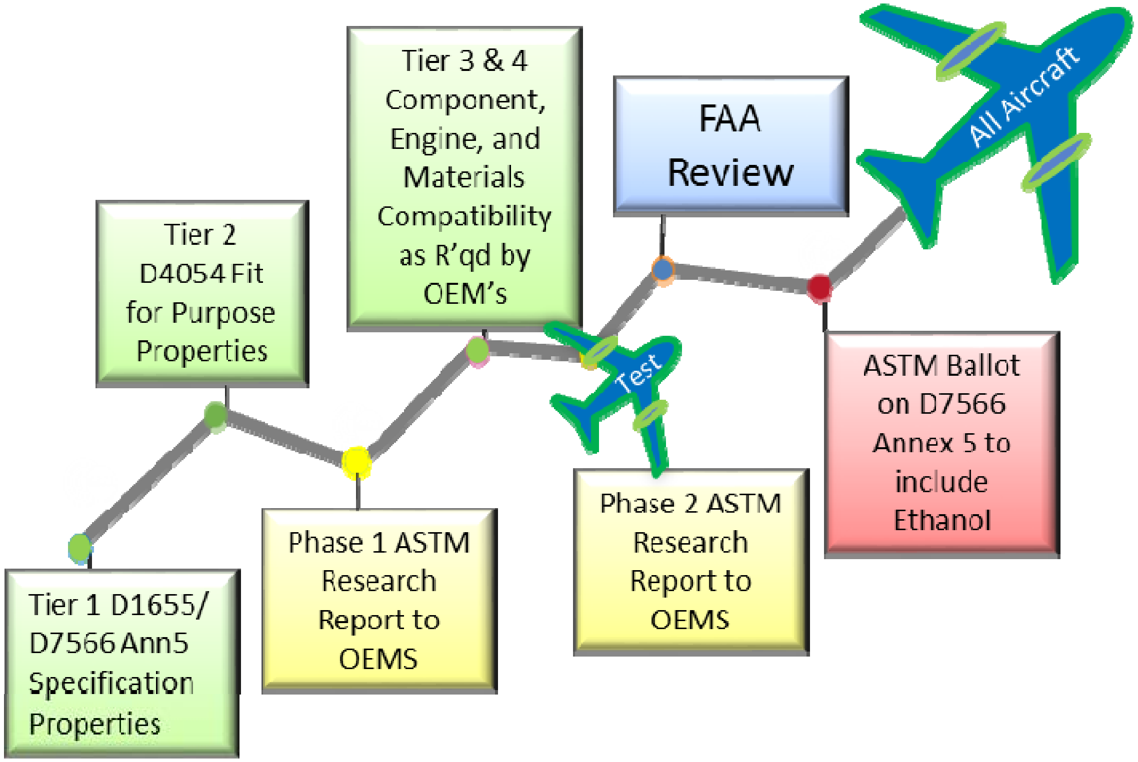
Property	Limit	Jet A/A-1 spec	50% ATJ Lab /50%Jet A	50%GRE Demo /50% Jet A	50%LZ Demo /50% Jet A	ASTM Method	
Smoke Point, mm	Min	25.0	31.4	29.1	29.1	D1322	✓
Copper Strip, 2h 100°C	Max	No 1	1a	1a	1a	D130	✓
Thermal Stability Temperature , °C Filter pressure, mm Hg Tube Rating	 Min Max Less than	 260 25 3	 >325 1 1	 >325 0 1	 >325 0 1	 D3241	 ✓ ✓ ✓
Existent Gum, mg/100ml	Max	7	<1	<1	<1	D381	✓
Microseparometer Rating W/O additive	Min	85	99	100	97	D3948	✓

ASTM 7566 Table 1 Part 2 Extended Requirements of Aviation Fuel Containing SPK (50% ATJ /50% Jet A)

Property	Limit	Jet A/A-1 spec	50% ATJ Lab /50%Jet A	50%GRE Demo /50% Jet A	50%LZ Demo /50% Jet A	ASTM Method	
Aromatics, vol%	Min	8, 8.4	8.7	8.8	8.6	D1319, D6379	✓
Distillation T50-10, °C	Min	15	28	27	30	D86	✓
Distillation T90-10, °C	Min	40	70	67	68	D86	✓
Lubricity, mm	Max	0.85	0.59	0.70	0.70	D5001	✓
Viscosity@-40 °C mm^2/sec	Max	12	9.1	9.9	9.3	D445	✓

Both Grain ethanol (GRE) and Lanzanol (LZ) Blended with 50% Jet A meet D7566 specifications

Demonstration Fuel Next Steps



- ✓ **Phase 1 Report submitted to ASTM Coordinators <u>September 2016</u>**
- ✓ **Report in queue to progress through the step by step process**
  - ➢ **Review of Phase 1 FFP data by engine and aircraft OEMs**

- **On-going OEM data analysis and review to determine required Tier 3 & 4 components**
  - **Engine, materials compatibility, and flight demonstration data for inclusion in Phase 2 Report**
- **Completion of OEM review process and balloting to the ASTM membership for eventual incorporation into D7566 specification for drop-in jet fuel**

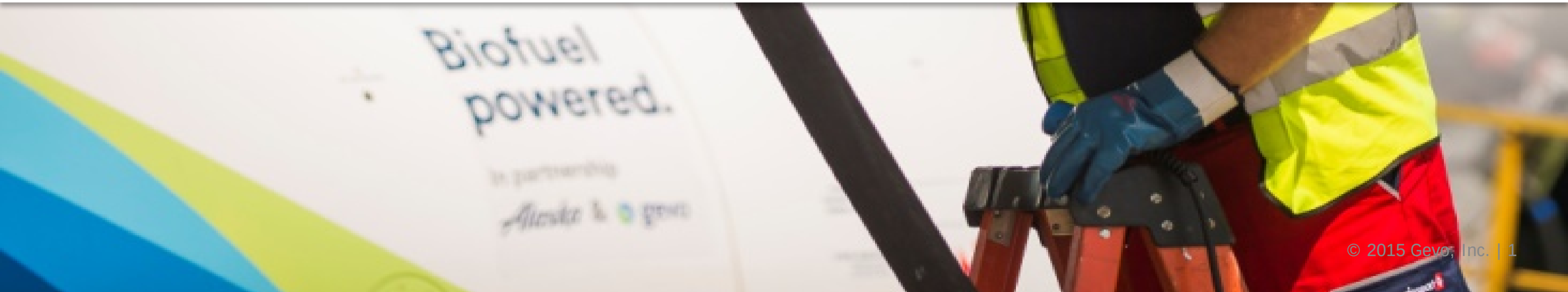
Goal: Add ethanol to isobutanol as an approved ATJ feedstock in D7566 Annex 5

LanzaTech

CAAFI Biennial General Meeting

Washington, D.C.

Oct 26th, 2016



Forward-Looking Statements

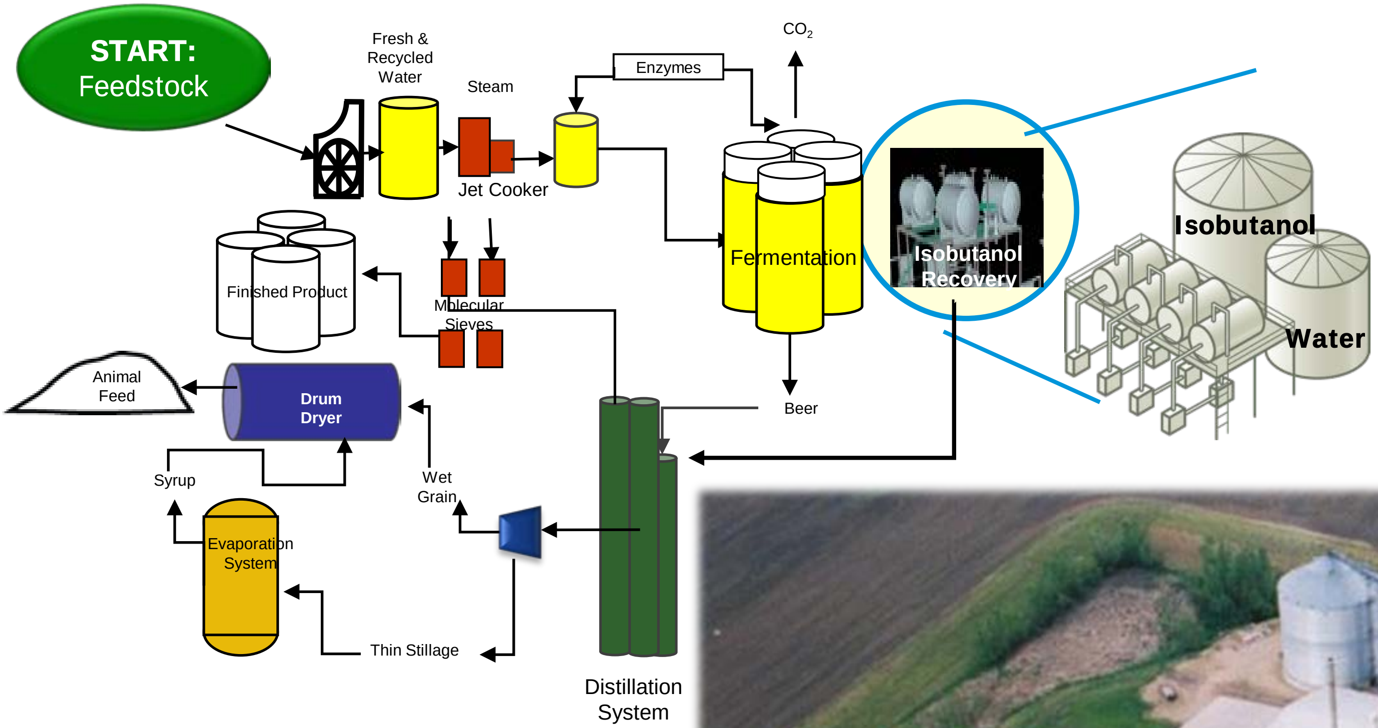
Certain statements within this presentation may constitute “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995. Such statements relate to a variety of matters, including but not limited to: the timing and costs associated with and the availability of capital for Gevo’s scheduled retrofits of existing ethanol production facilities, its future isobutanol production capacity, the timing associated with bringing such capacity online, the availability of additional production volumes to seed additional market opportunities, the expected applications of isobutanol, including its use to produce renewable paraxylene, PET, isobutanol-based fuel blends for use in small engines, and ATJ bio-jet, production costs and sensitivities, capital costs and sensitivities, tax credits and RIN pricing and availability, addressable markets, and market demand, Gevo’s ability to produce commercial quantities of isobutanol from cellulosic feedstocks, the suitability of Gevo’s iDGs™ for the animal feed market, the expected cost-competitiveness and relative performance attributes of isobutanol and the products derived from it, the strength of Gevo’s intellectual property position and other statements that are not purely statements of historical fact. These forward-looking statements are made on the basis of the current beliefs, expectations and assumptions of Gevo’s management and are subject to significant risks and uncertainty. All such forward-looking statements speak only as of the date they are made, and Gevo assumes no obligation to update or revise these statements, whether as a result of new information, future events or otherwise. Although Gevo believes that the expectations reflected in these forward-looking statements are reasonable, these statements involve many risks and uncertainties that may cause actual results to differ materially from what may be expressed or implied in these forward-looking statements. For a discussion of the risks and uncertainties that could cause actual results to differ from those expressed in these forward-looking statements, as well as risks relating to the business of the company in general, see the risk disclosures in Gevo’s Annual Report on Form 10-K for the year ended December 31, 2014, and in subsequent reports on Forms 10-Q and 8-K and other filings made with the Securities and Exchange Commission by Gevo.

This presentation has been prepared solely for informational purposes and is neither an offer to purchase nor a solicitation of an offer to sell securities.

Our Process

Alcohol to Hydrocarbons

How We Produce Isobutanol (GIFT®)



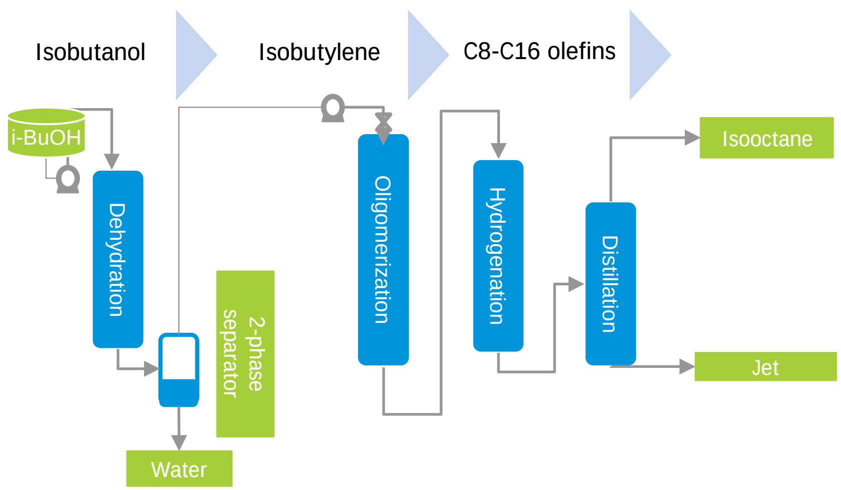
IBA to Hydrocarbons: Simple Economic Process

Confidential

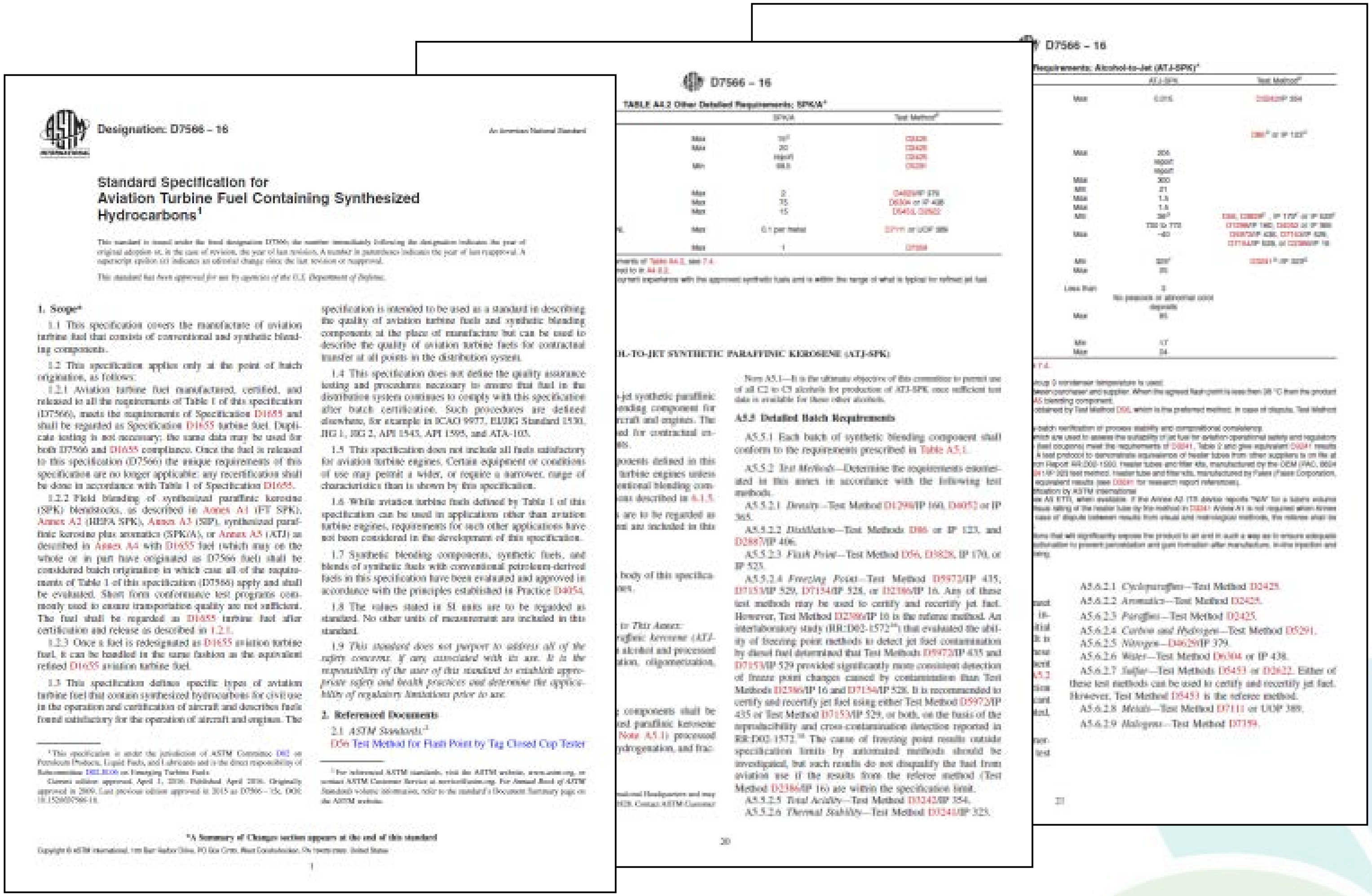
Technology overview

- Proprietary processing based on standard unit operations leads to high yields, with minimum of co-products.
- Gevo has been producing jet fuel and isooctane since 2011.
- Simple product mix of isooctane and jet, yields at 98% of theoretical.

Process Flow



ASTM D7566 Annex 5


Designation: D7566 – 16

An American National Standard

Standard Specification for
Aviation Turbine Fuel Containing Synthesized Hydrocarbons[1]

D7566 – 16

TABLE A4.2 Other Detailed Requirements: SPK/A

D7566 – 16

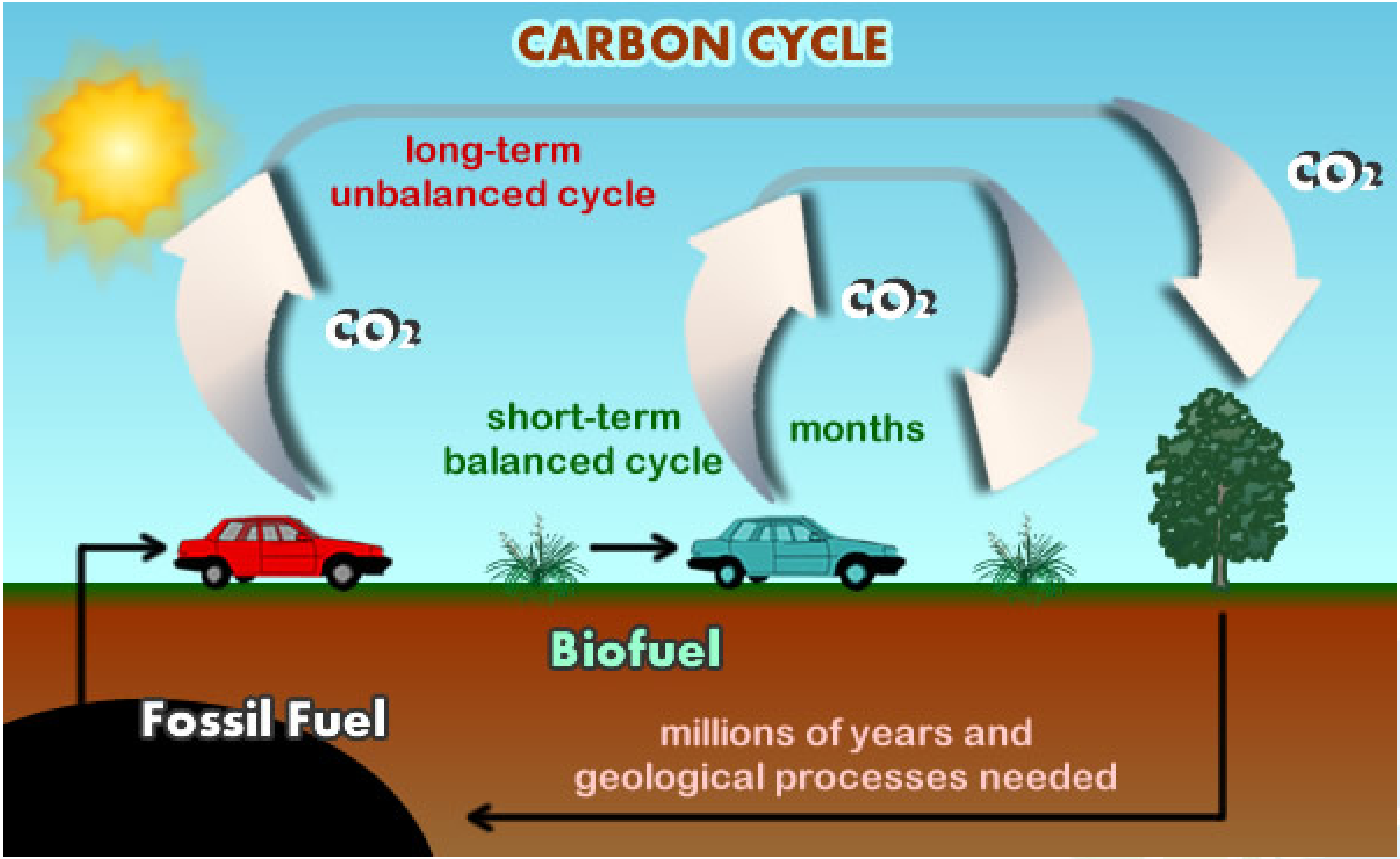
Requirements: Alcohol-to-Jet (ATJ-SPK)

Renewable Jet from Cellulosic Sugars is in Development

NARA – Northwest Advanced Renewables Alliance (Gevo is the technology supplier for fermentation and Renewable Jet) has been conducting a demonstration project to convert wood waste to jet fuel.

First Commercial Volume Cellulosic Renewable Jet Fuel

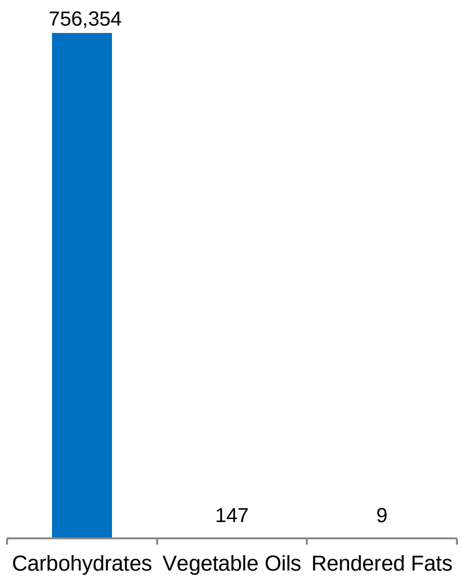
Sustainability – Short Term Carbon Cycle



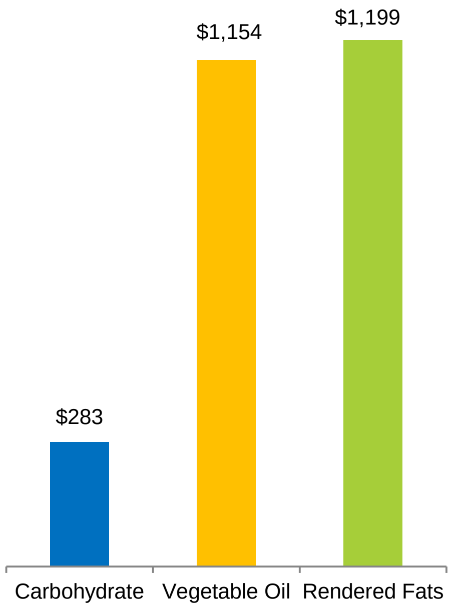
....Utilizing Abundant, Low Cost Renewable Feedstock

- The large size of the jet fuel market means large scale feedstocks are important
- Carbohydrates are significantly more abundant and cost less to obtain than other feedstocks used

Feedstock Availability (000's MT)



Feedstock Cost per Ton ($/MT)



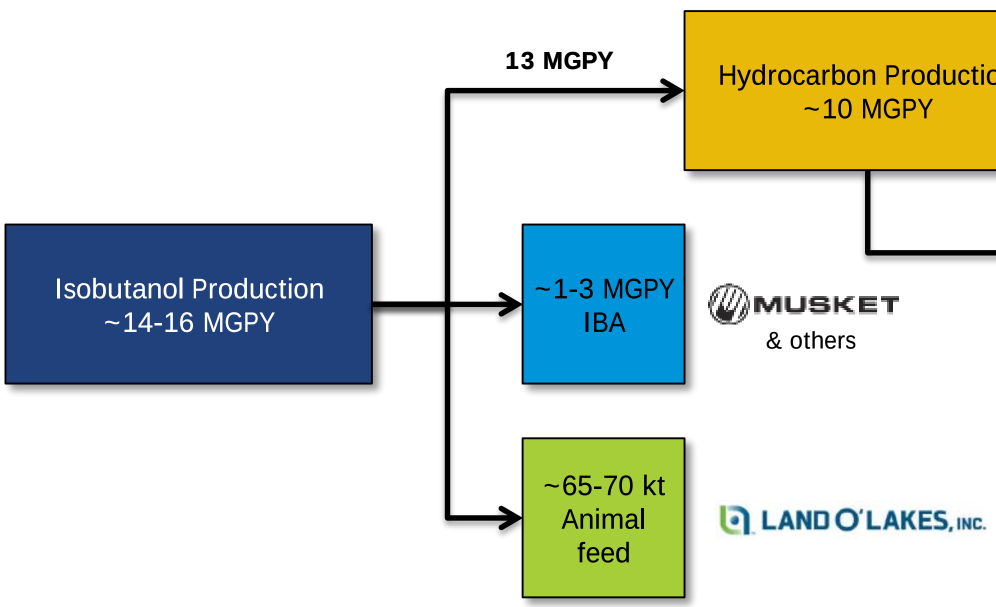
**Based on updated Nexant Models and engineering projections*
Assumed $3.60/bu corn, average tallow/grease price from NRA market report

Source: 2010/2011 USDA Foreign Agriculture Service (FAS), NRA 2015

Building Out Luverne

- Strategy: Leverage installed assets at Luverne and adding the capability to produce 7-10 MGPY of hydrocarbons.
- Luverne is a proving ground for products and supply chain development.
- Currently completing FEL2 (Front-end loading) engineering for construction which includes robust planning and design.

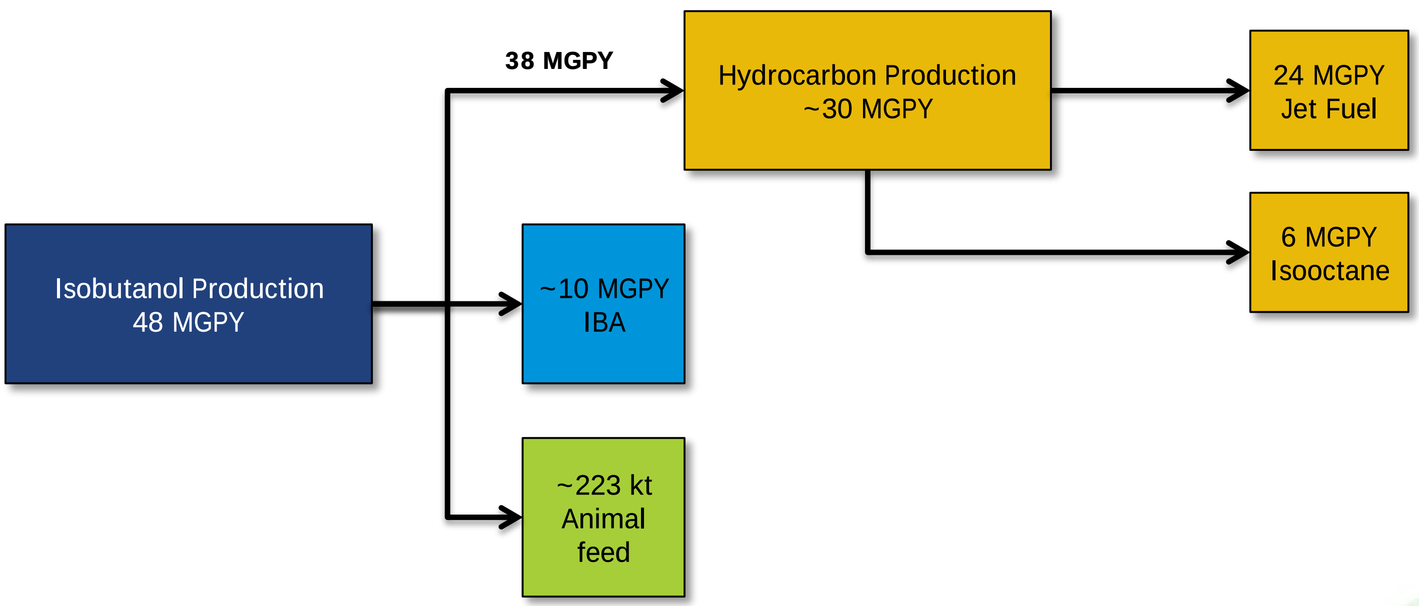
Potential Buildout Overview



Building Out – Plant 2 and beyond

- Link term sheets of Luverne build-out to commercial build-out
- Those participating at Luverne will be advantaged for future volumes

Commercial Buildout Overview (Beyond Luverne)



Thank you

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