



# Gevo Overview

Large Scale Drop-Ins from Renewable Olefins

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# 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 ability of Gevo to enter into a definitive offtake agreement with Lufthansa; the ability of Gevo to build out the Luverne production facility to increase the production of isobutanol and/or hydrocarbon products; addressable markets, size of markets and market demand for isobutanol, ethanol and their derivatives; optimized isobutanol production costs and plantlevel economics, including achievable EBITDA margins; future market opportunities related to Gevo's alcohol-to-hydrocarbons technologies; Gevo's ability to successfully scale up its ethanol-to-olefins technology; Gevo's ability to obtain customer, licensing, investment and strategic partnership commitments and the timing of bringing such commitments online; Gevo's future isobutanol and ethanol production capacity and the timing associated with bringing such capacity online; estimates of the timing and costs of capital expenditures at the Luverne plant and the impact of such installations; Gevo's ability to sustain achievements in production capacity; the strength of Gevo's intellectual property position and its ability to successfully and profitably license its technology platform to third parties; the performance of Gevo's isobutanol yeast biocatalyst; 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, isooctane and ATJ bio-jet; the expected cost-competitiveness and relative performance attributes of isobutanol and the products derived from it; the receipt and timing of ASTM and MIL-SPEC certification; the future price volatility of isobutanol and its derivatives; any potential decreases in Gevo's expense levels, including as a result of the Butamax settlement, and anticipated EBITDA burn rates 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, 2015, as amended, and in subsequent reports on Forms 10-Q and 8-K and other filings made with the Securities and Exchange Commission by Gevo, including any prospectus supplements related to this offering.
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#### What Gevo is All About....

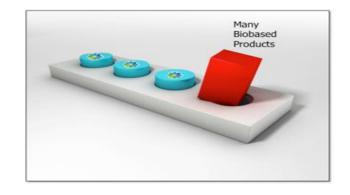


#### **Fuels**

#### **Chemicals**

















Jet Fuel (ATJ)

Renewable Gasoline (Isooctane)

Gasoline Blendstock (IBA)

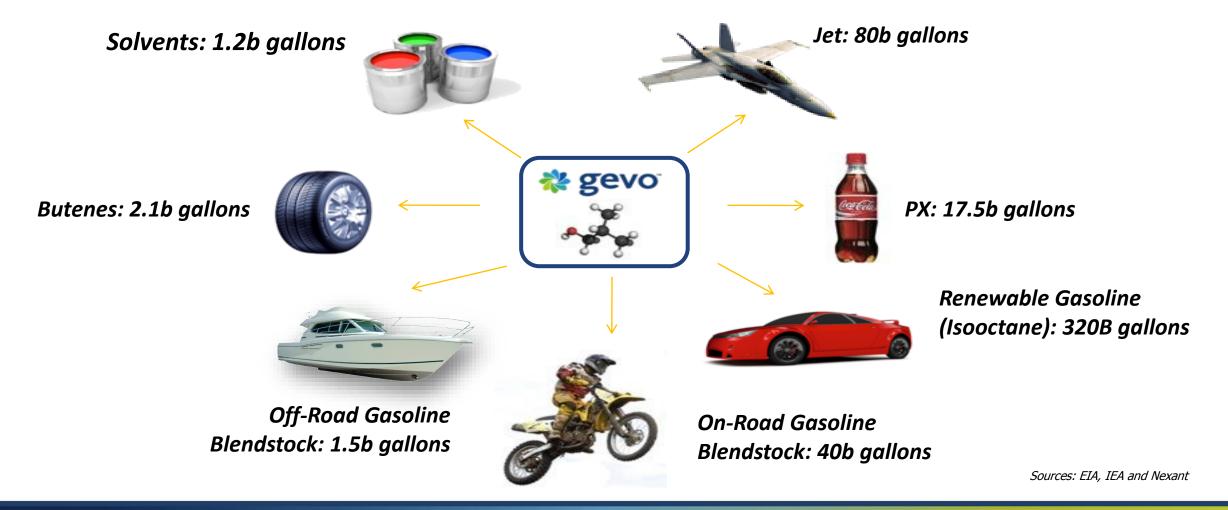
Chemicals and Solvents (IBA)

Opportunity to replace major fossil GHG sources, with technologies and products that have been demonstrated to work



# **\*** gevo

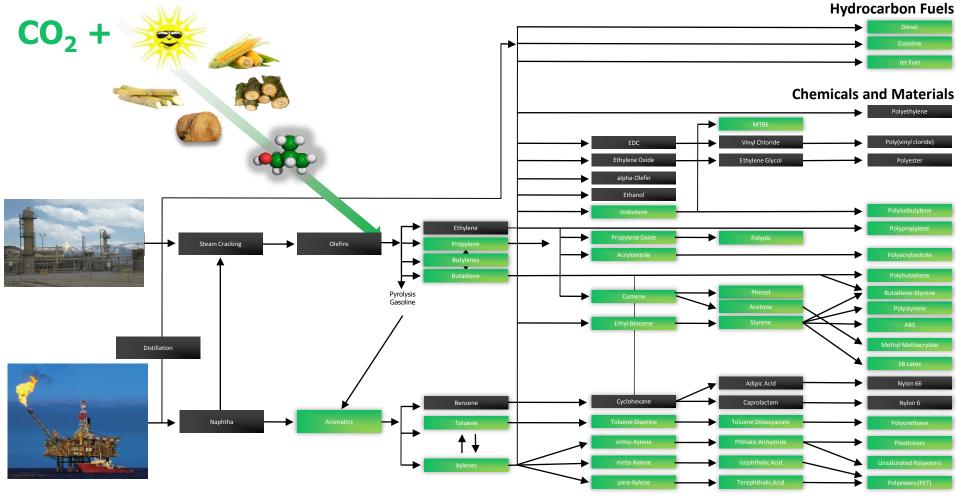
#### Gevo's Renewable Isobutanol is A Platform Molecule





#### Isobutanol Platform Leverages Existing Infrastructure





Source: Adapted from Nexant

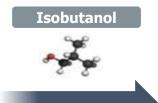
Note: Chemicals shaded green denote those which can be made from isobutanol-derived building blocks.





#### **Gevo Production Facilities**

# Isobutanol Production – Side-by-Side with Ethanol Luverne, MN 15 MGPY Ethanol 1.5 MGPY Isobutanol\*





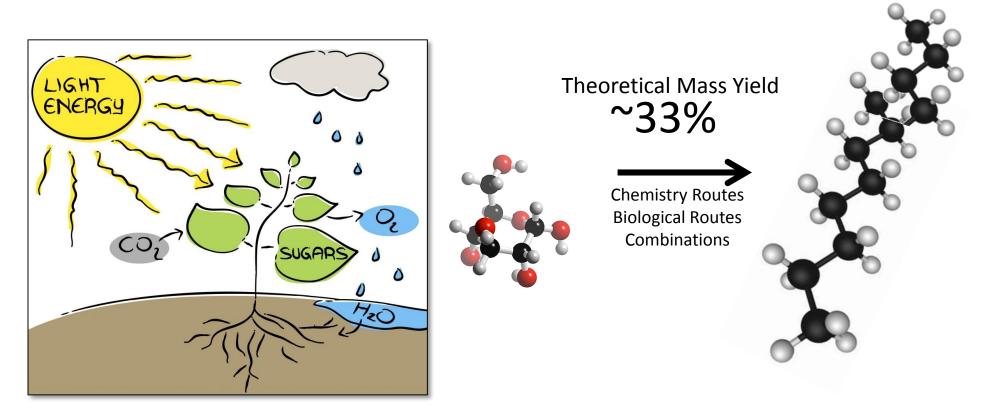


Renewable Hydrocarbons



# Gevo's Route to Renewable Hydrocarbons is Efficient





Current technology >80% of theoretical yield



# Potential Product mix at Luverne Production Plant (Expansion Scenario)





~94 Million lbs per year of animal feed



~3 Million lbs per year corn oil



~10 million lbs per year Isobutanol



~8 MGPY Jet



~2 MGPY Isooctane



# Coproducts Are Critical to Low Cost Sugars















#### **Jet Fuel**

- Lower Carbon
- Non-petroleum feedstock
- Higher energy density, cleaner burning

**TAM: 89 BGPY** 











#### **Renewable Gasoline** (Isooctane)

- High octane performance fuel
- Lower carbon



#### **Gasoline Blendstock**

- High octane performance fuel
- Advanced RIN potential



#### **Solvents & Chemical Applications**

**Existing Market** 

**TAM: 320 BGPY** 









**TAM: 43 BGPY** 







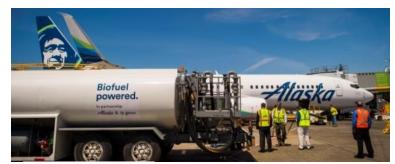
**TAM: 1.2 BGPY** 







# 'Alcohol-to-Jet' (ATJ) Renewable Jet Fuel



Biofuel powered.

In partnership

Alaska & se gevo

**Alaska Airlines** 

Commercial Flights

Lufthansa

Supply HOA

June 7, 2016 Flight on Gevo's ATJ

Alaska Airlines To Fly on Gevo's Renewable Alcohol to Jet Fuel

Flights from Seattle to SFO and DCA Demonstrate Alaska Airlines' Sustainability Leadership

ENGLEWOOD, Colo., June 07, 2016 (GLOBE NEWSWIRE) -- Gevo, Inc. (NASDAQ:GEVO), announced that the first two commercial flights using Gevo's

Nov 14, 2016 Flight on Gevo's Cellulosic ATJ

Alaska Airlines to Fly Today on Gevo's Cellulosic Renewable Alcohol to Jet Fuel

Gevo's Fuel to Power Alaska Airlines Flight #4 from Seattle to DCA ENGLEWOOD, Colo., Nov. 14, 2016 (GLOBE NEWSWIRE) -- Gevo, Inc. (NASDAQ:GEVO), announced that the first commercial flight using Gevo's cellulosic renewable alcohol to jet fuel (ATJ) is expected to take place today originating in Seattle





### ASTM Certified ATJ is a True Drop in, but with Improved Properties

- Lower freezing point
- Very low sulfur means lower SOx
- Higher Energy Density
- No Aromatics = Lower Particulate Emissions



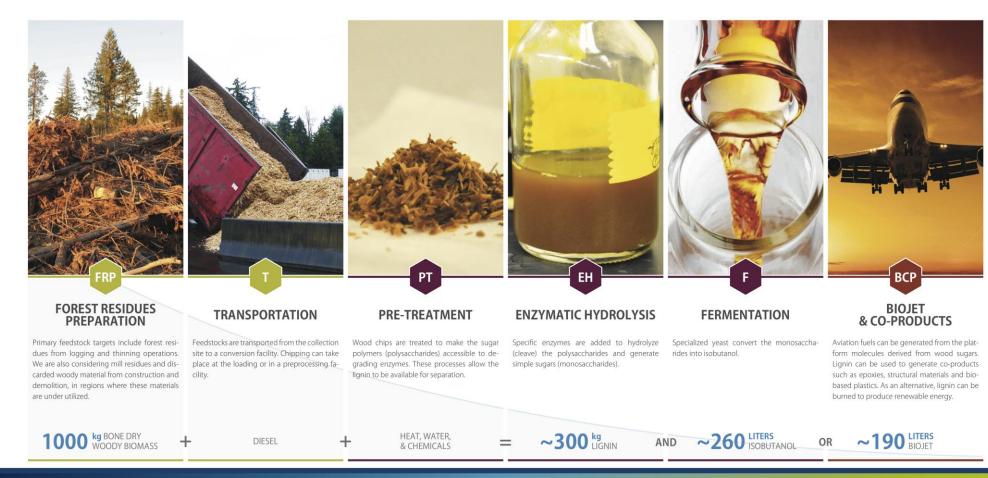
Property (Test Method)	ASTM D1655 Specification (Jet A/Jet A-1)	Typical Jet A-1 (CRC 647)	ATJ-SPK
Freezing Point (ASTM D2386)	-40°C max Jet A -47°C max Jet A-1	- 50°C	<-80°C
Flash Point (ASTM D3828)	38°C min	48°C	48°C
Energy Density (Net Heat of Combustion) (ASTM D3338)	42.8 MJ/kg min	42.9 MJ/kg	43.2 MJ/kg
Thermal Oxidation Stability (JFTOT) (ASTM D3241)	pass	pass	pass
Total Sulfur Content (ASTM D2622)	0.3% max	0.05%	<0.01%





#### Northwest Advanced Renewables Alliance

USDA Funded Consortium 5 year project successfully completed in 2016 with Gevo cellulosic jet used in commercial flight





# Renewable Isooctane – High Performance, Low Carbon, Renewable Gasoline







Total Supplying Formula 1(R) Racing Fuel Containing Gevo's Renewable Isooctane

Multiple Victories Achieved by the Infiniti Red Bull Racing Team With the Total Fuel

ENGLEWOOD, Colo., Oct. 21, 2014 (GLOBE NEWSWIRE) -- Gevo, Inc. (Nasdaq:GEVO), the world's only commercial producer of renewable isobutanol, announced that it is



# Isobutanol to p-Xylene Could Enable 100% Renewable PET



- Isobutanol to isooctene to p-Xylene demonstrated at demo scale
- >90% Selectivity to PX
- Hydrogen Coproduct









Toray to Convert Gevo's Para-Xylene to Bio-Polyester (PET)

ENGLEWOOD, Colo., May 29, 2014 (GLOBE NEWSWIRE) -- Gevo, Inc. (Nasdaq:GEVO) announced that it is selling para-xylene (PX) derived from its renewable isobutanol to Toray, one of the world's leading producers of fibers, plastics, films, and chemicals. PX is a primary raw material for the manufacture of bio-polyester (PET). PET has the



# Isobutanol Gasoline Blendstock Market- Now At the Pump



Differentiation: "High octane, RFS compliant, High RIN value, Ethanol Free Fuels"





#### **Key Partners**































#### **FACT SHEET**

# EMISSIONS AND OPERABILITY OF GASOLINE, ETHANOL, AND BUTANOL BLENDS IN RECREATIONAL MARINE APPLICATIONS

"Biobutanol is **particularly interesting to the marine industry** as it is significantly **more resistant to phase separation** than ethanol. It is also **less corrosive** to fuel system component materials such as fuel tanks, fuel hoses, primer bulbs, gaskets and o-rings when compared to ethanol<sup>2</sup>."

<sup>1</sup>DOE Annual Progress Reports - Emissions and Operability of Gasoline, Ethanol, and Butanol Blends in Recreational Marine Applications - marinebiobutanol.net

<sup>2</sup>Kass, M., Theiss, T., Janke, C., Pawel, S., et al "Compatibility Study for Plastic, Elastomeric, and Metallic Fueling Infrastructure Materials Exposed to Aggressive Formulations of Isobutanol-blended Gasoline" Oak Ridge National Laboratory, 2014

<sup>a</sup>Wasil, J., McKnight, J., Kolb, R., Munz, D. et al., "In-Use Performance Testing of Butanol-Extended Fuel in Recreational Marine Engines and Vessels," SAE Technical Paper 2012-23-0011,2012, doi:10.4271/2012-32-0011.





# Partnership with Praj for Sugar/Molasses Based Isobutanol Process



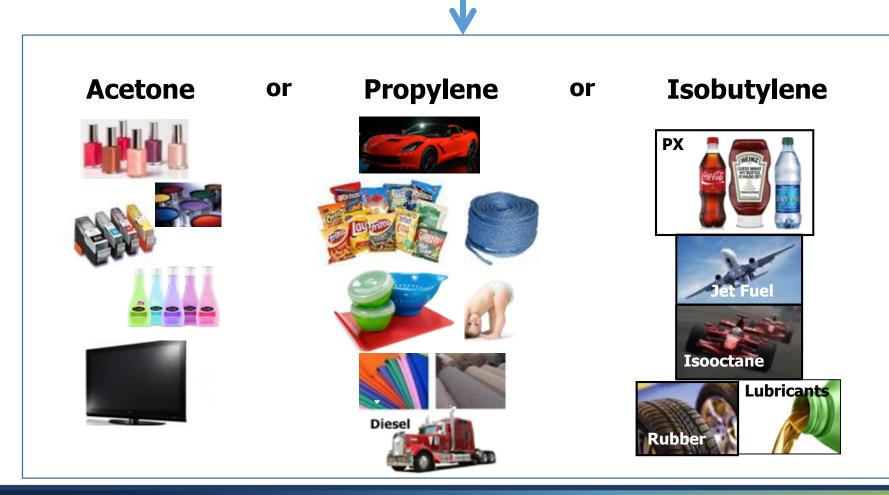


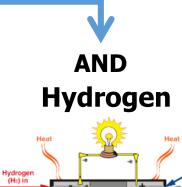
# **ETO Technology**





Catalytic Conversion







**FUEL CELL** 





#### **Fuel Grade Ethanol**

Proprietary Catalytic Conversion



#### **Propylene (84% Molar Yield)**

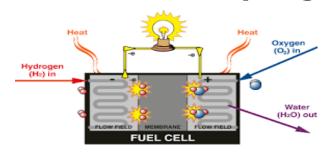
















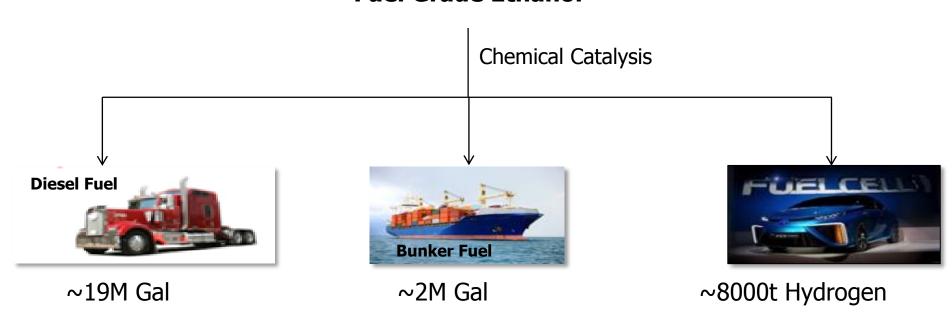


Diese



#### Potential for a Low Cost Route to Renewable Diesel

# **50 Million Gallons Fuel Grade Ethanol**



Illustrative examples, based on lab results and economic modeling





# Thank You



