

National Biodiesel Board

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INDUSTRIALS

ETHANOL

BIODIESEL



Outline

Introduction to ADM

Policy

Biobased Chemicals

Key Criteria for advancement of
Biobased Chemicals

Summary



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ADM: A History of Innovation

27,000 employees
Operating in 60 countries
\$44 billion in revenue



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Connecting Crops to Growing Markets



Food



Feed



Fuels



Industrials



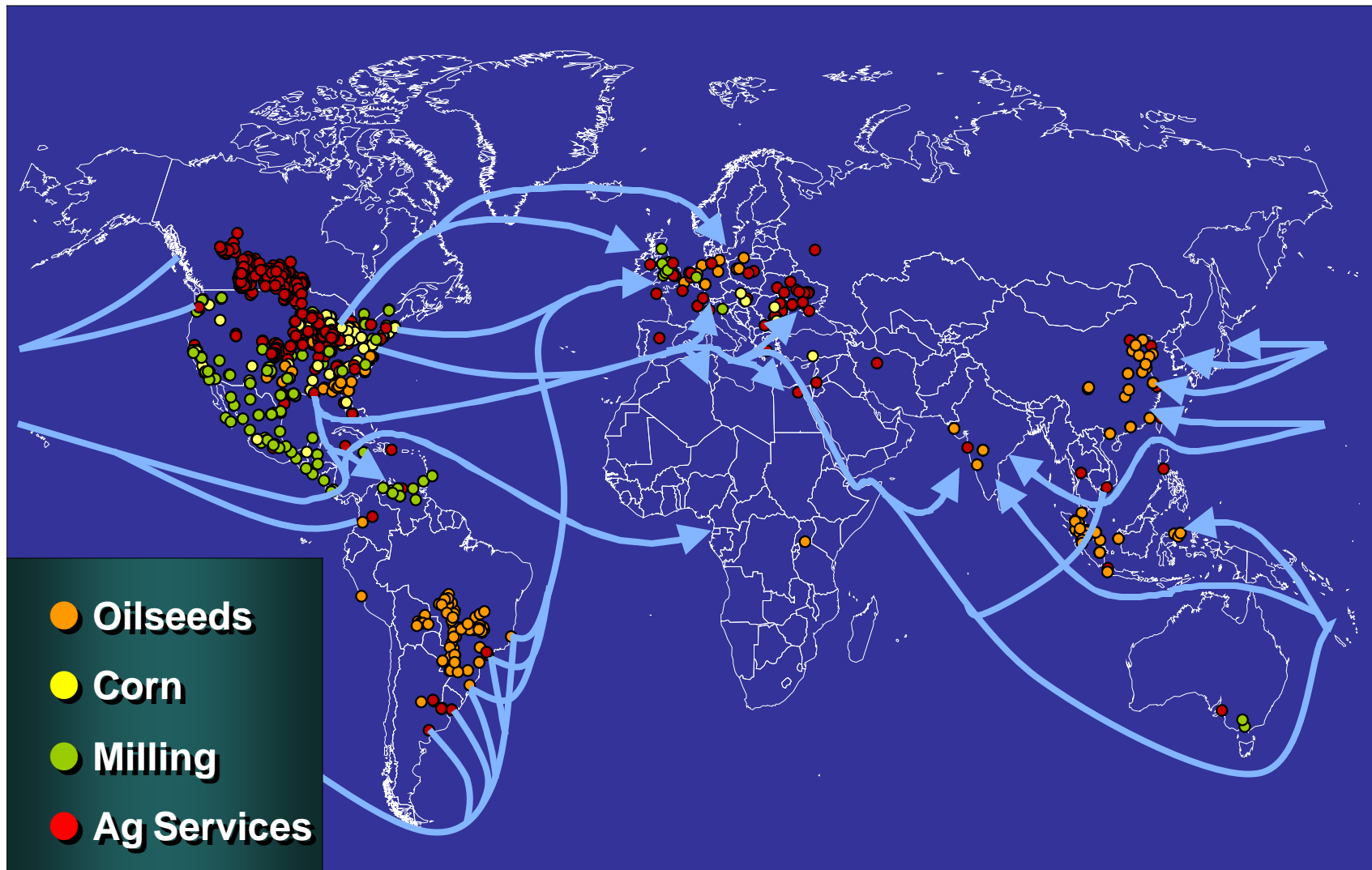
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Our Global Network



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ADM

Related Recent Highlights

Announcement of Research Center In Hamburg
Germany

Aggressive capital investments in Bio fuels
expansion (Ethanol & Biodiesel)

PHA Joint venture with Metabolix in Clinton IA
50,000 mt capacity

Propylene Glycol Facility in Decatur IL 100,00 mt
capacity

Co2 Sequestration Decatur IL

Research Forum with COP on Biomass



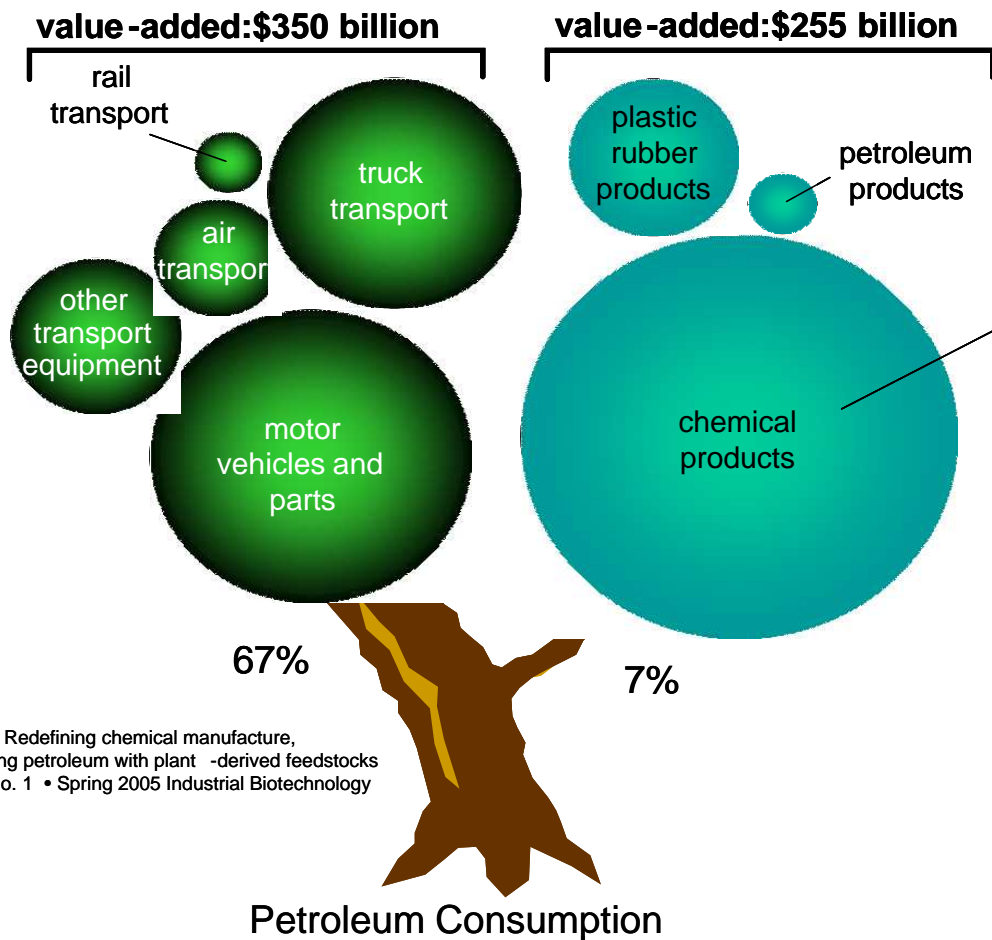
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POLICY



Source: Redefining chemical manufacture,
 Replacing petroleum with plant -derived feedstocks
 Vol. 1 No. 1 • Spring 2005 Industrial Biotechnology



Paints and Coatings



Fibers



Bulk Chemicals



Specialty Chemicals



Packaging



Adhesives



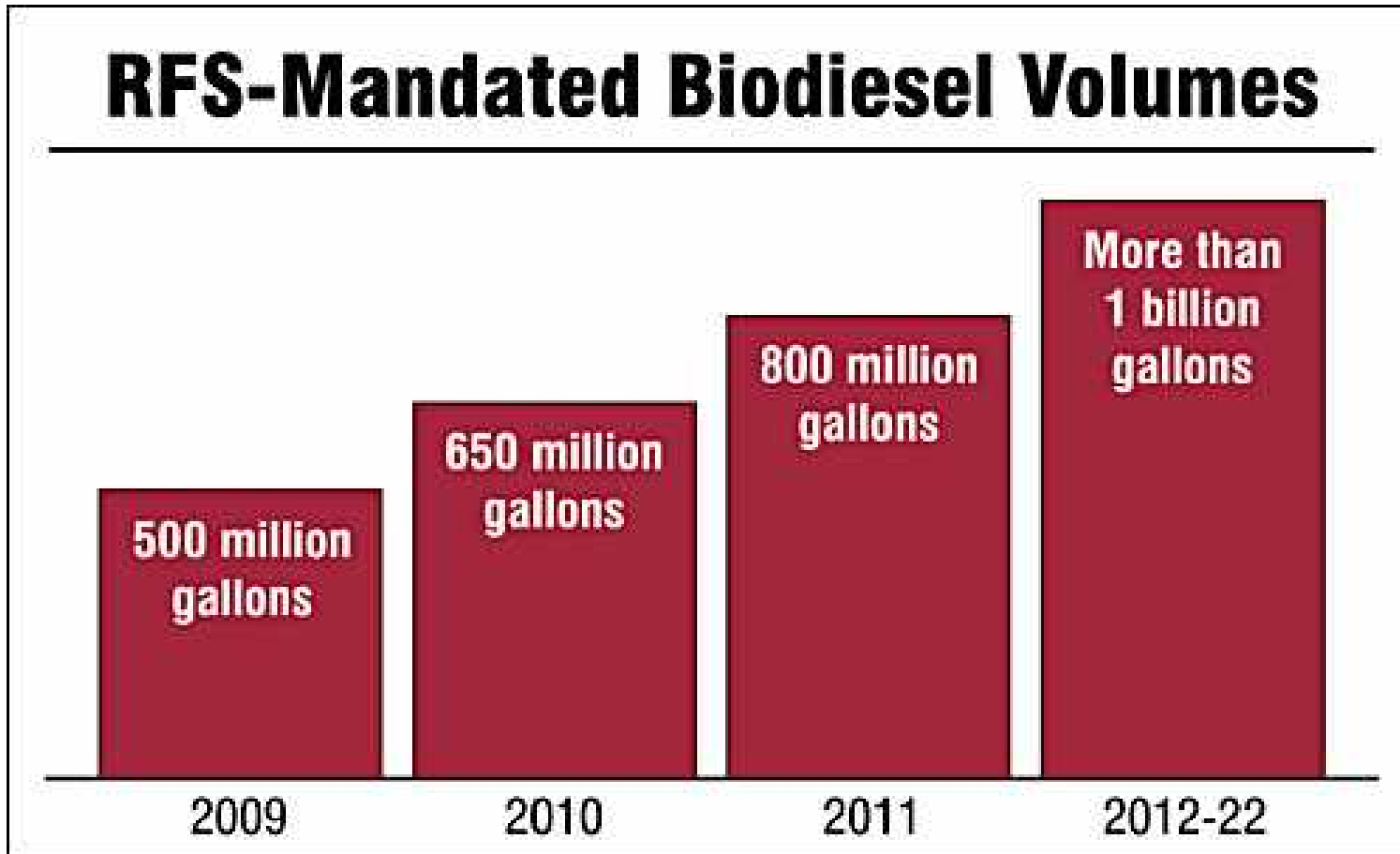
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Related Policy



Based on Energy Independence and Security Act of 2007



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EU & South America Policy

Targets are set for 2020

- 10 % liquid fuel
- 20% Energy / heat / Electricity
- Sustainability
 - Assignment of rules for greenhouse gas impact on various biofuels
 - Environmentally sensitive land

Argentina

- 5% by 2010

Brazil

- 2% current
- 5% by 2010



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Global Trends



- World's largest energy consumer
- Advanced Energy Initiative
- Bio-friendly investment
- Growing demand for bio-based

- RFS discussions

- Bio-friendly Energy Policies
- World's largest biodiesel consumer
- Sustainability

- Geopolitical Challenges
- Petrochemical investment

- Increasing protein consumption
- World's largest population
- Fastest growing energy consumer
- Chinese renewable energy policy

- NAFTA Tariff Ruling
- MTBE replacement

- Kyoto Standards

- Arable land for bioenergy crops

- World's fastest growing population
- Increasing energy needs

- Expanding agricultural acreage
- World's largest fuel alcohol user
- Biodiesel policy



Biobased Chemicals

What traditional chemicals have Biobased alternatives currently?

- Industrial grade Ethanol
- Glycerine
- Lactic Acid
- 1,3 Propanediol

Near Term Future

- Propylene Glycol
- Epichlorohydrin



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Biobased Announcements

ADM		100,000 mt
• Propylene Glycol - Glycerine / Sorbitol		Decatur IL
Dow Chemical Company		unknown
• Propylene Glycol - Glycerine		Houston
Huntsman Corporation		unknown
• Propylene Glycol - Glycerine		Texas
Dow Chemical Company		150,000 mt
• Epichlorohydrin - Glycerine		China
Solvay		100,000 mt
• Epichlorohydrin - Glycerine		Thailand
Cargill / Ashland		65,000 mt
• Propylene Glycol - Glycerine		Europe



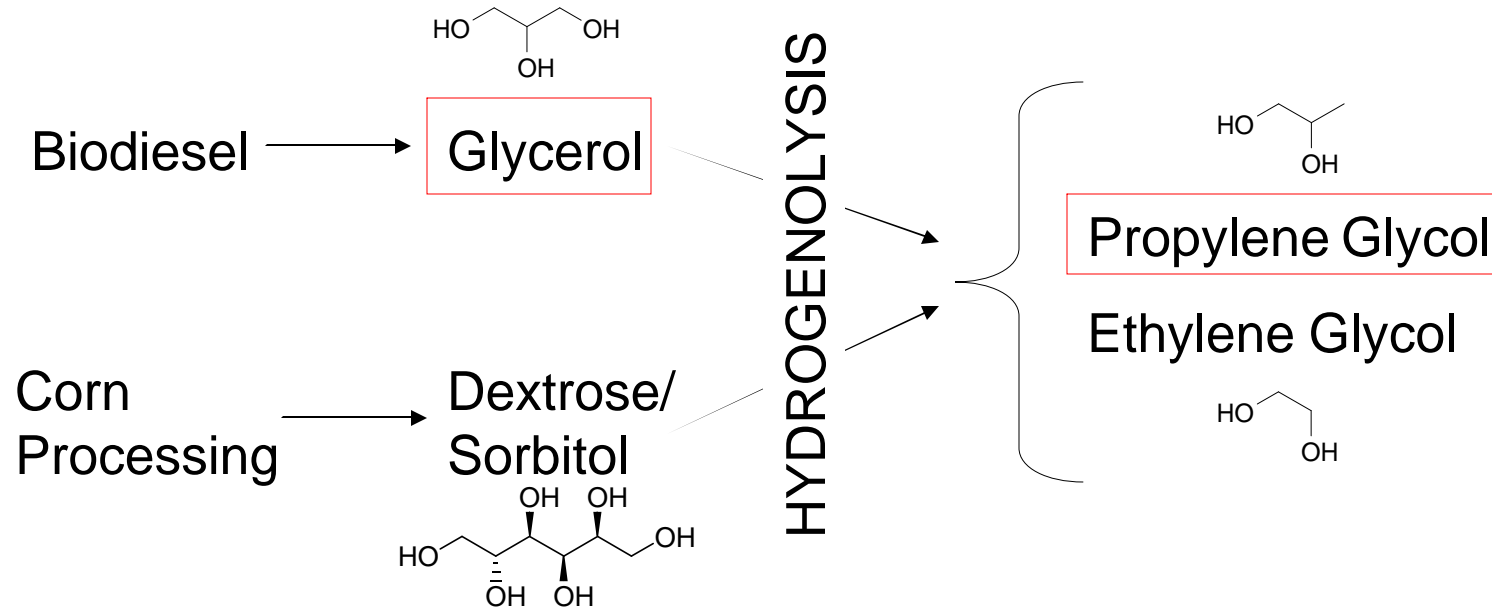
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New Glycerol Markets



Use glycerol co-product from Biodiesel

Flexible feedstock – Corn or Oilseeds

USP and industrial grades

100% biobased – use to formulate products



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Propylene Glycol and C-3

Current U.S. Propylene glycol production is >1B lbs/yr and growing

Propylene glycol derived from propylene

Major end applications

- Fiberglass resin
- Personal care, cosmetics, food, pharma
- Liquid laundry detergents
- Deicers and antifreeze

What else can be made from glycerol as a C-3 feedstock?



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Glycerine Molecule Opportunities

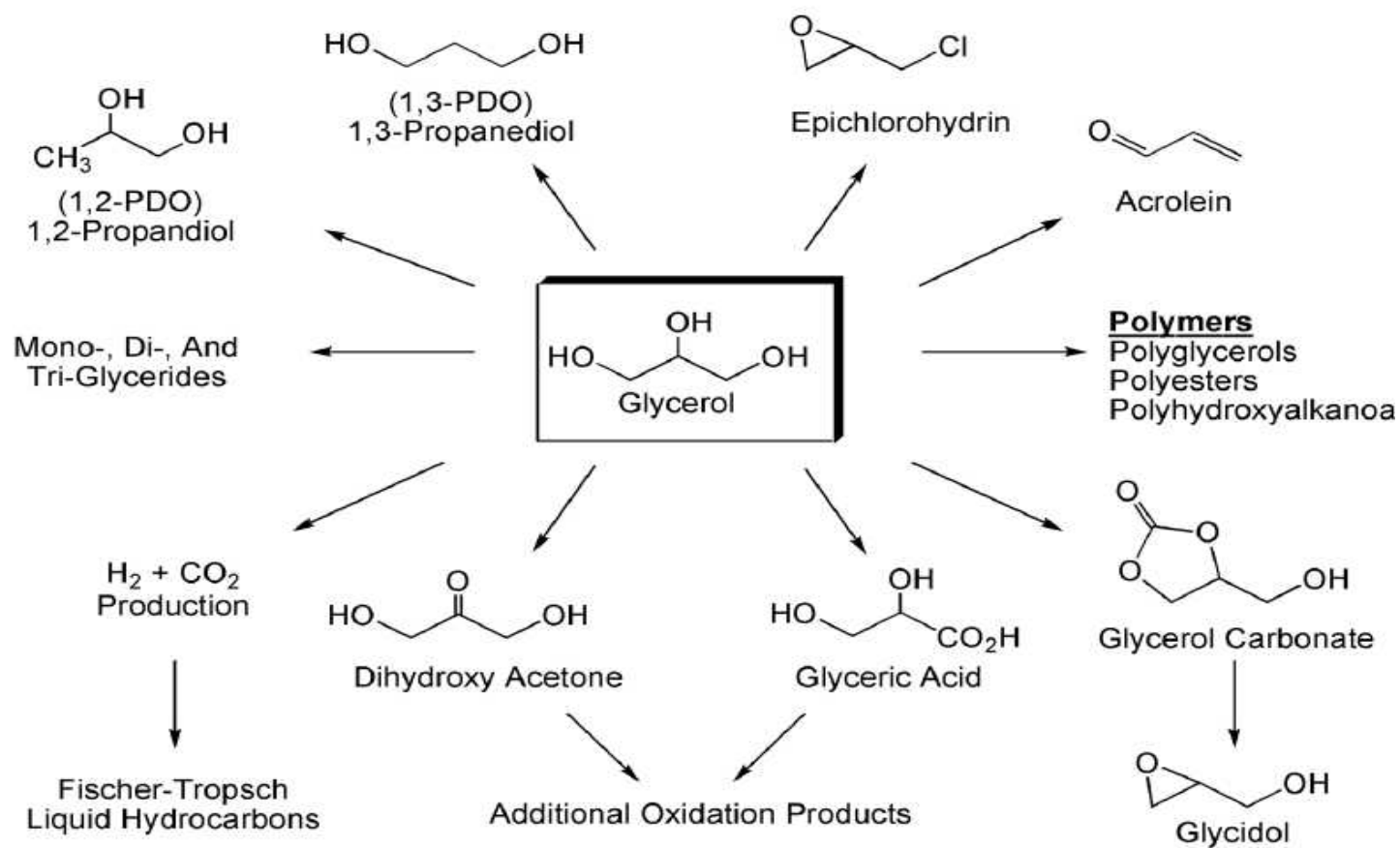


Figure 2. Platform chemicals derived from glycerol.

USDA Nov 2007



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Biobased Chemicals

Key Drivers

Economics (efficient conversions)

Feedstock availability

Utilities

Transportation network

Distribution network

Capitol resources

Scale of economics

Ability to develop/ source/ partner on technology

Global footprint

Replacement chemical or enhanced properties



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Why ADM- Biobased Chemicals

Reduce petroleum Imports

Global supply of glycerine from global Biodiesel operations

Flexible feedstock operations

Technology

- Conversion (catalyst / enzymes / fermentation)
- Separation
- Purification

Competitive utilities / shared services

Companion operation to renewable energy processing



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Summary

Expanded biobased energy and chemical Production

Chemical industry built on platform chemicals – Biobased emergence in infant stages

Market place

Policy and regulations

Investment - innovation / engineering partnership manufacturing



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