

# Gevo And Jet Fuel

Overview with Sustainability

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## FORWARD LOOKING STATEMENTS

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Any statements in this presentation about our future expectations, plans, outlook and prospects, and other statements containing the words “believes,” “anticipates,” “plans,” “estimates,” “expects,” “intends,” “may” and similar expressions, constitute forward-looking statements within the meaning of The Private Securities Litigation Reform Act of 1995. Actual results may differ materially from those indicated by such forward-looking statements as a result of various important factors, including risks relating to the benefits and characteristics of our products, revenue projections and other factors discussed in the “Risk Factors” of our most recent Annual Report on Form 10-K for the fiscal year ended December 31, 2017 and in other filings that we periodically make with the SEC. In addition, the forward-looking statements included in this investor presentation represent our views as of the date of this investor presentation. Important factors could cause our actual results to differ materially from those indicated or implied by forward-looking statements, and as such we anticipate that subsequent events and developments will cause our views to change. However, while we may elect to update these forward-looking statements at some point in the future, we specifically disclaim any obligation to do so. These forward-looking statements should not be relied upon as representing our views as of any date subsequent to the date of this investor presentation.

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# GEVO ON A CRUSADE TO DECARBONIZE FOSSIL FUELS



## Raw Materials

Now



Enabled



Future



**Ethanol/Isobutanol Plant**



**Isobutanol to Jet Fuel and Isooctane Plant**

**Gevo produces & sells low-carbon, renewable, high-performance fuel products**



**High Performance Oxygenate Blendstocks for Gasoline (Ethanol and Isobutanol)**



**Fully Renewable Jet Fuel**

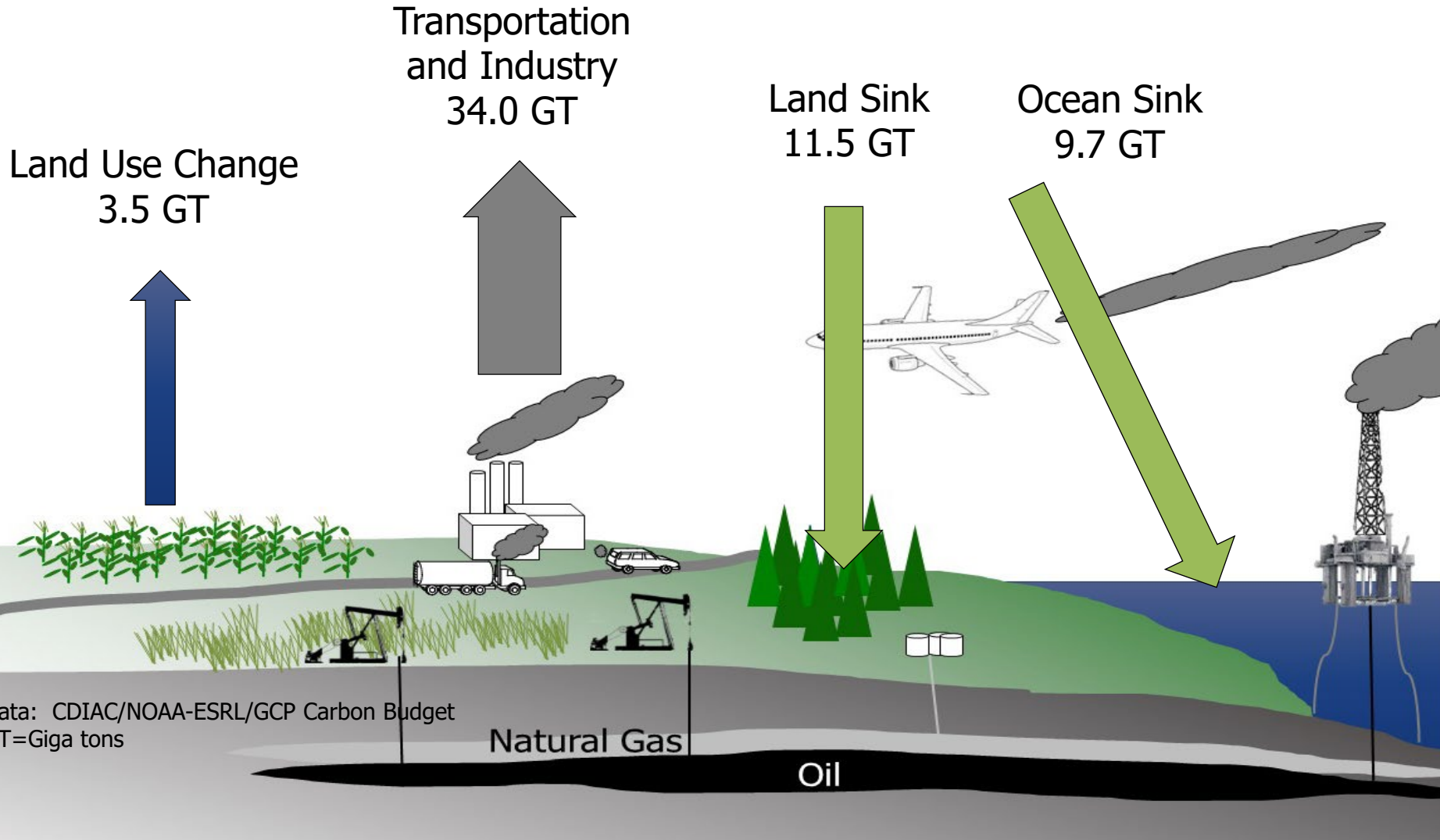


**Fully Renewable Isooctane for Gasoline**

# ATMOSPHERIC CO<sub>2</sub> HAS INCREASED BY ~16 GT FROM 2006 TO 2015 FROM FOSSIL CARBON USE

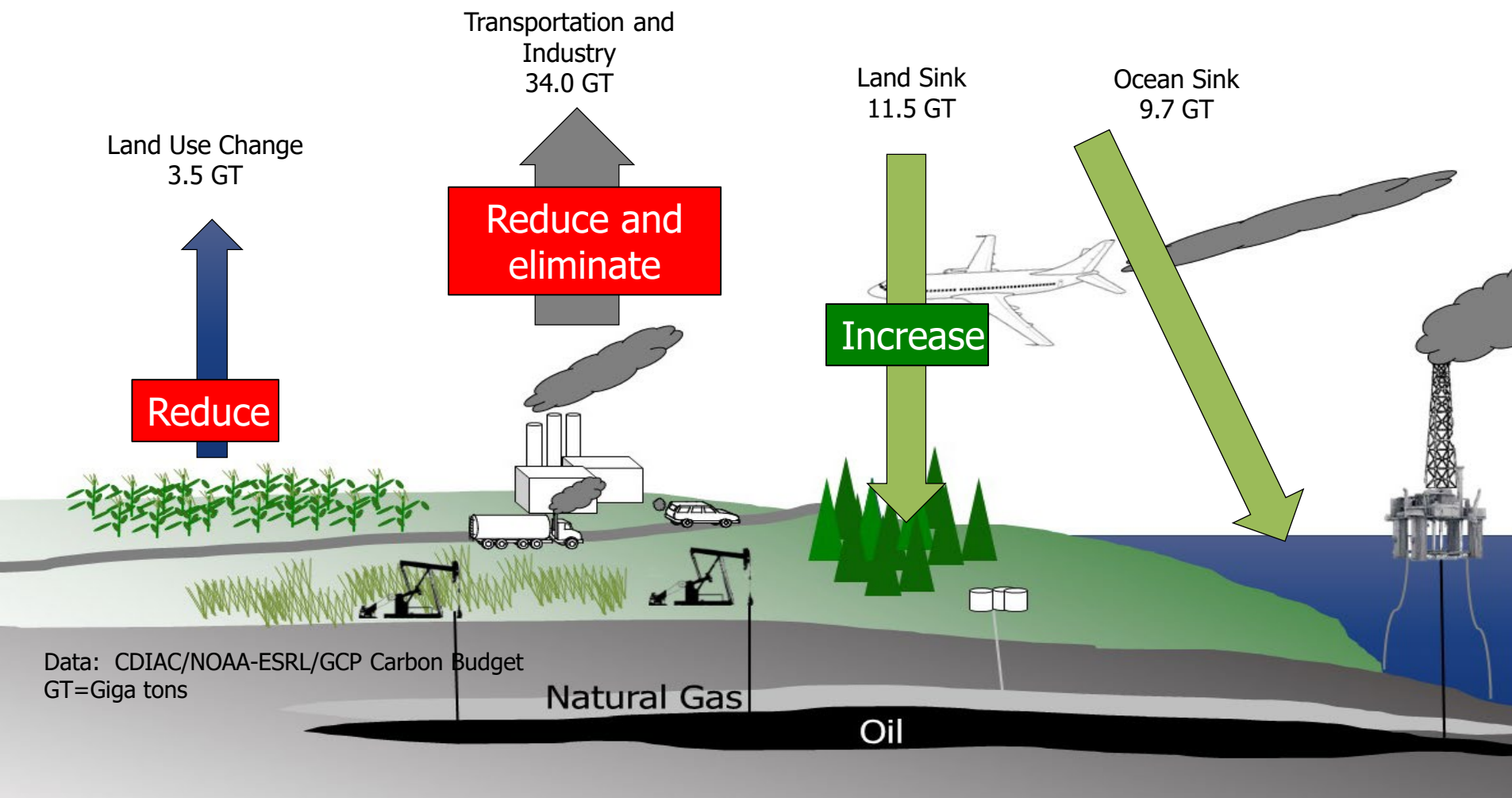


More Carbon Dioxide is being generated than the sinks can take up

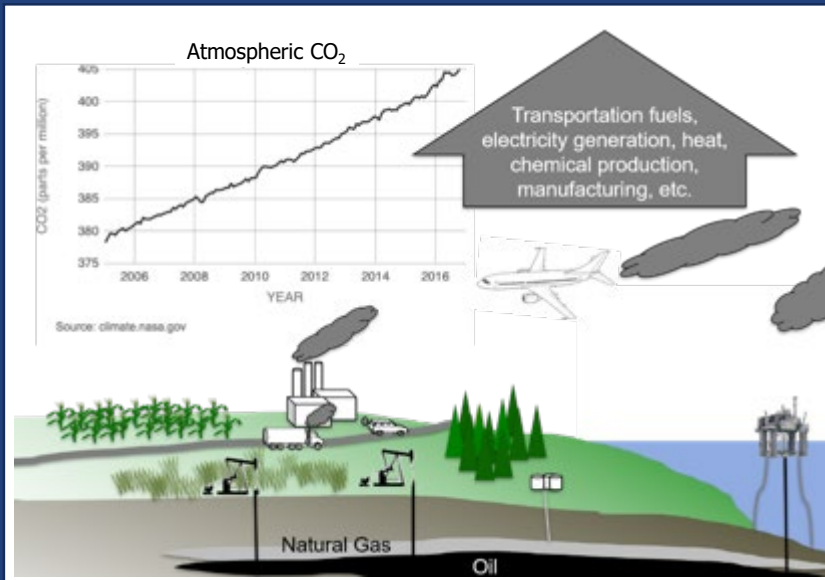


# WHAT DO WE NEED TO DO?

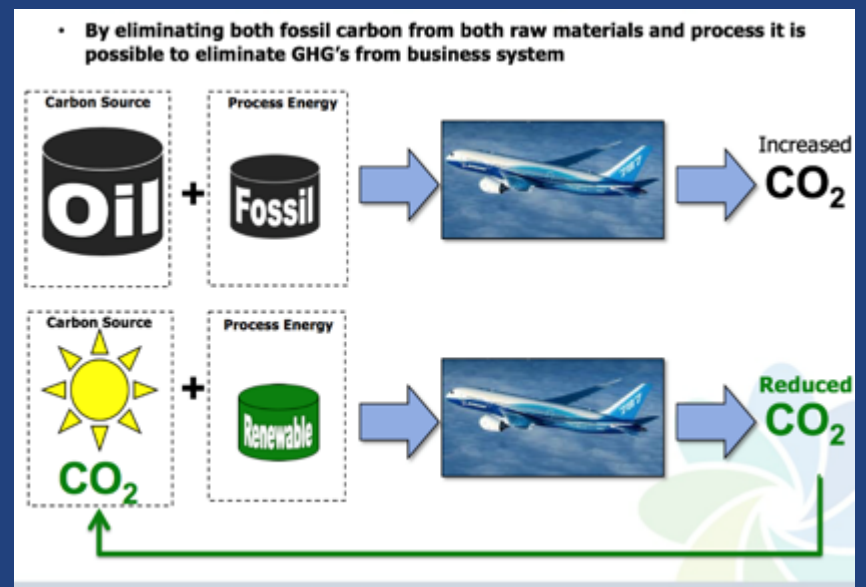
Reduce fossil fuels for transportation and energy generation with low carbon alternative carbon sources. **Reduce land use change by increasing yield and productivity. Increase the amount of carbon being put into the ground by utilizing good farming practices.**



# THE PROBLEM AND SOLUTION



**THE PROBLEM:**  
Burning of Fossil Carbon Sources  
Generates Increased GHGs



**THE SOLUTION:**  
Decarbonization

# AVIATION INDUSTRY HAS AN OPPORTUNITY AND A PROBLEM

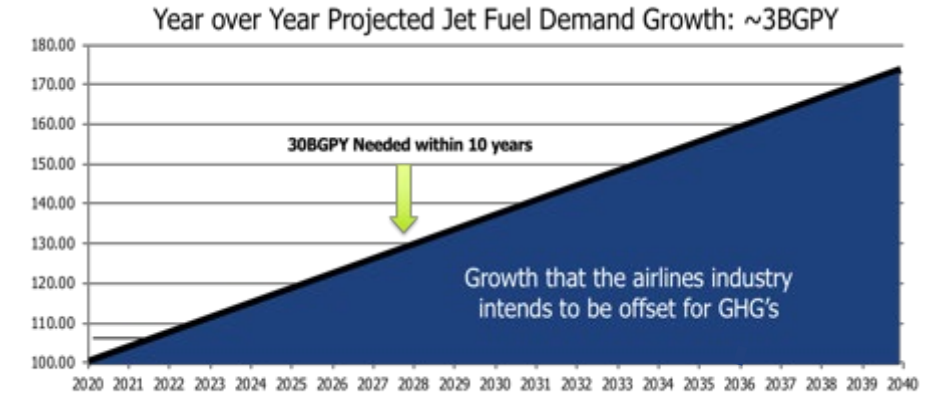


## They are expecting to experience strong growth....

- The Aviation Industry is expected to double in passengers over the 20 years to 2034
- The Aviation Industry accounts for 2% of GHG emissions (about the same as all of Germany), but it is expected to grow to 3% by 2050

## But, they have promised to hold GHG emissions Flat from 2020 onward

## World Jet Fuel Demand

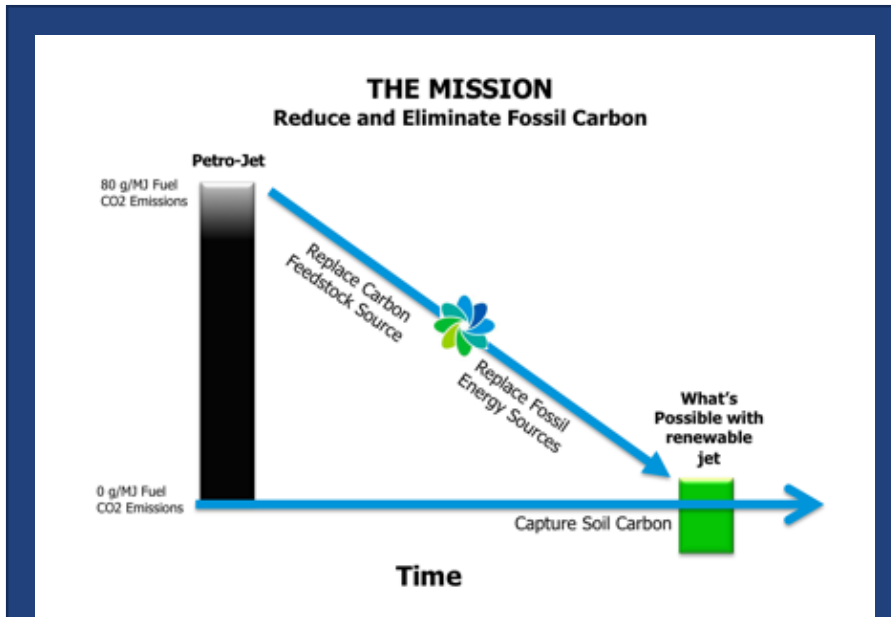


Sources: International Air Transport Association (IATA); EIA 2016 Annual Energy Outlook



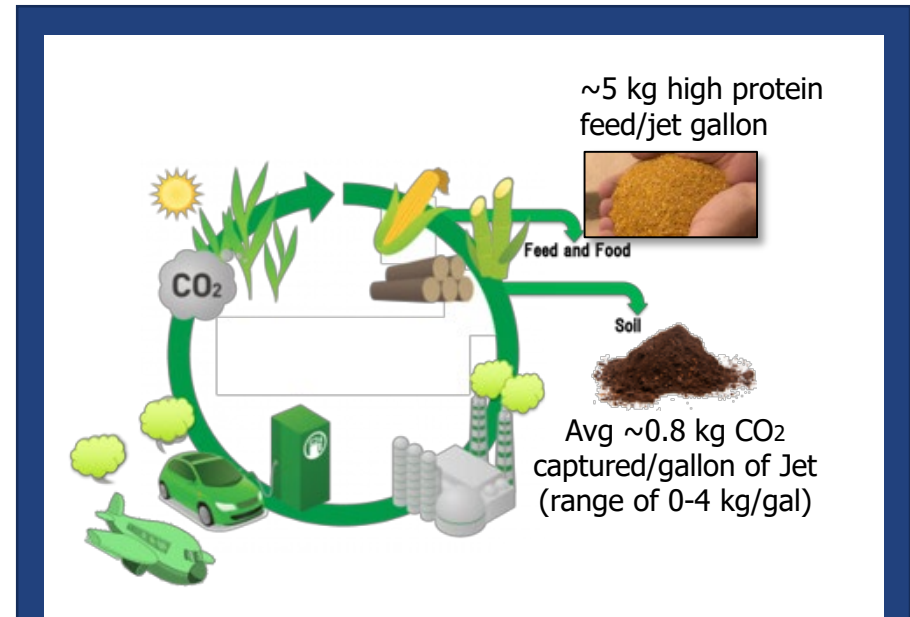
# "DECARBONIZE" TO CAPTURE ADDED VALUE

Produce & sell fuels, chemicals, protein - with Gevo Technology, while **lowering "carbon score" or "carbon index"**. The lower the score, the higher the price that Gevo can charge in certain markets



## HOW TO REDUCE CARBON IN HYDROCARBONS

Replacing fossil based products with renewables, and capturing value from the carbon reduction

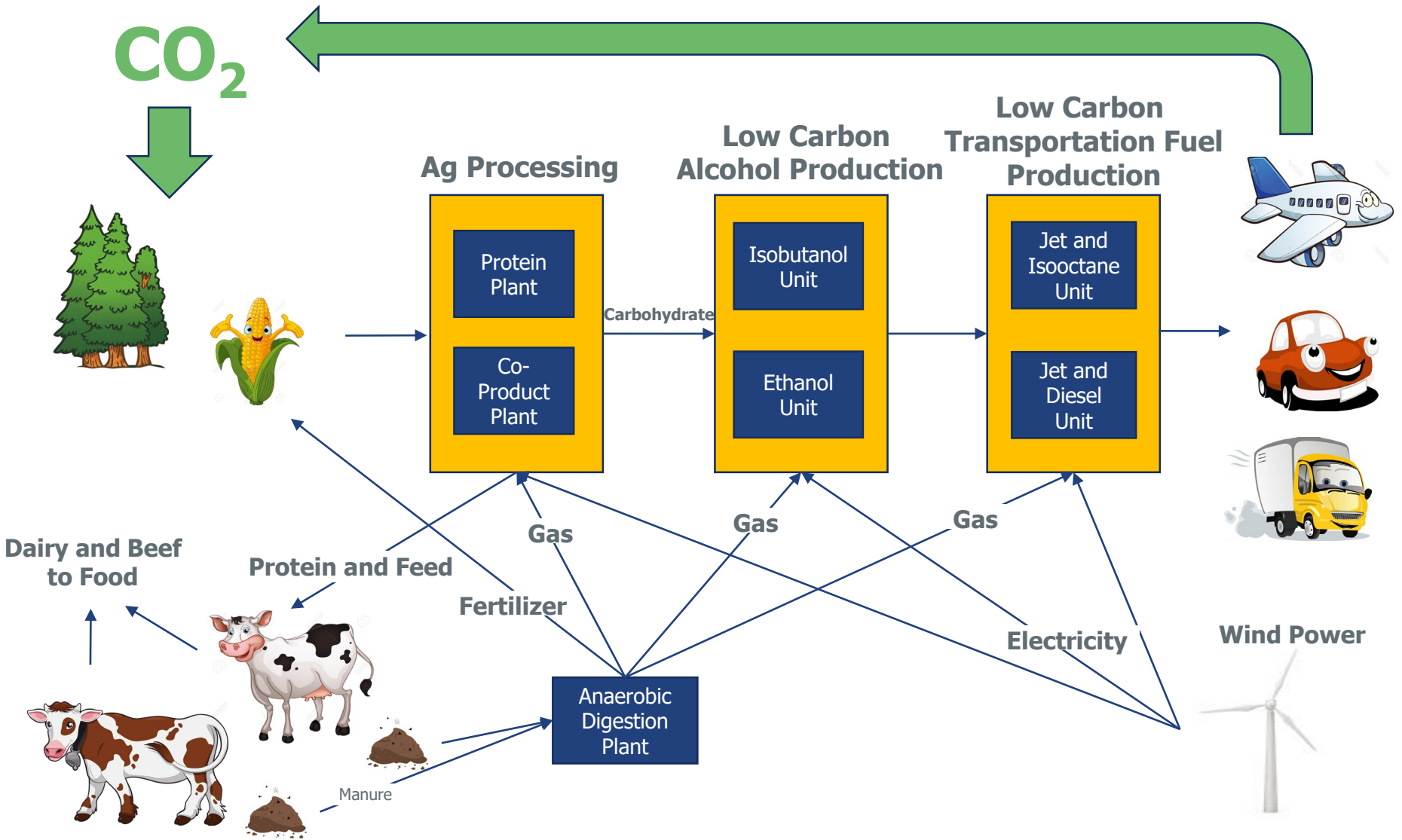


## A BETTER CARBON CYCLE For every 1BGPY of fuel:

- 5 Million MT of protein/feed could be produced
- 800 Kt to 4 million MT of carbon could be captured in soil



# BUILDING OUT THE LOW CARBON CYCLE



# OUR SUPPLIERS ARE ALREADY VERY GOOD, AND WILL BE BETTER

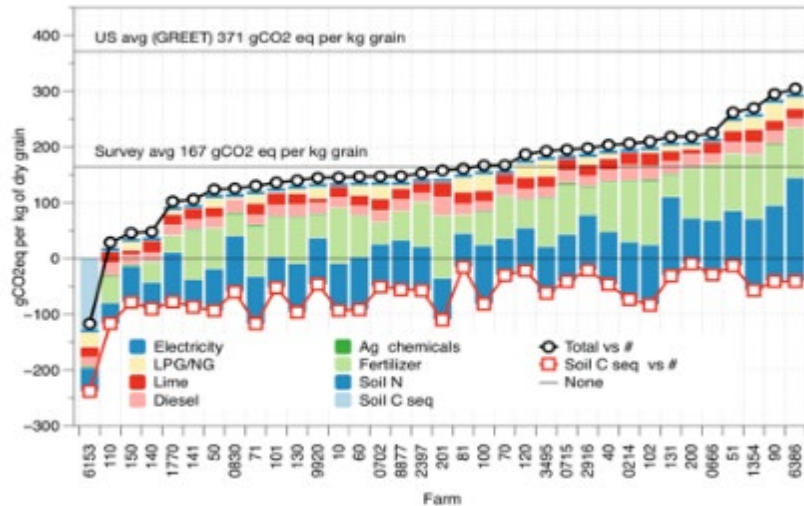


Figure 30. Grading on a curve—individual farm performance in terms of carbon footprint

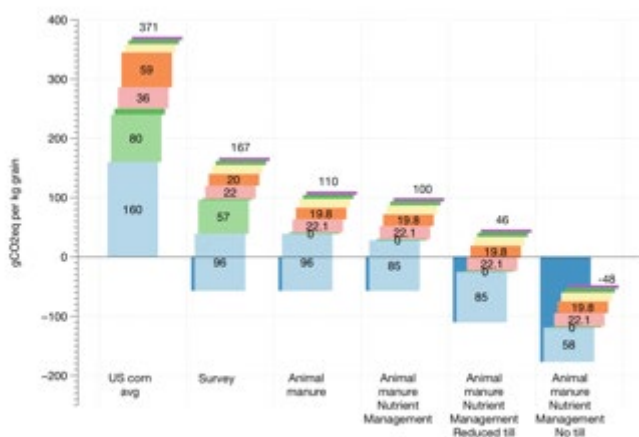


Figure ES 9. Greenhouse gas footprint for US corn, average survey results and four farm management scenarios

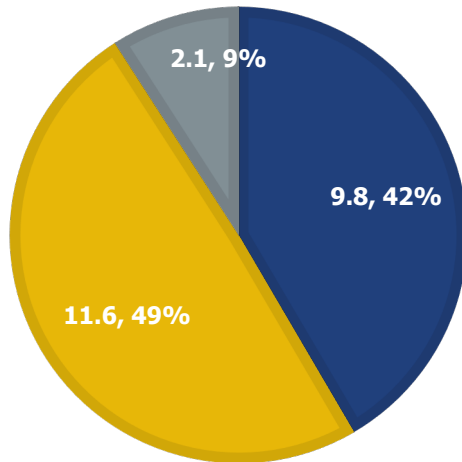
- Farmers who supply Gevo typically have 50% lower GHG emissions than average US farmer
- Some are much better, **even negative in GHG's**

- Combinations of improvement method could lead to significant reduction in GHG's
- We are establishing a system where improvements are rewarded!**

# 72% REDUCTION IN CURRENT RED AND 75% REDUCTION IN REDII FOR BIOJET FUEL (SUSTAINABLE CORN FEEDSTOCK)



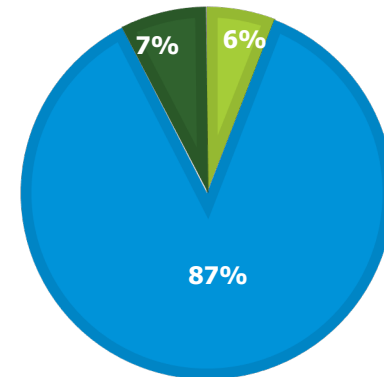
Gevo's side-by-side biofuel plant configuration utilizing sustainable corn as a feedstock and biogas produced from local manure should achieve approximately a 75% reduction in GHG emissions as compared to fossil-based conventional jet fuel using the REDII baseline for fossil fuel (94 gCO<sub>2e</sub>/ MJ)



- Emissions from the extraction or cultivation of raw materials (e ec); Emission saving from soil carbon accumulation via improved agricultural management (e sca)
- Emissions from processing (e p)
- Emissions from transport and distribution (e t&d)

## PROCESS SPECIFIC EMISSIONS

- Electricity consumption from grid
- Natural gas
- Biogas



Source: Gevo estimates based in part on calculations obtained from third party consultant

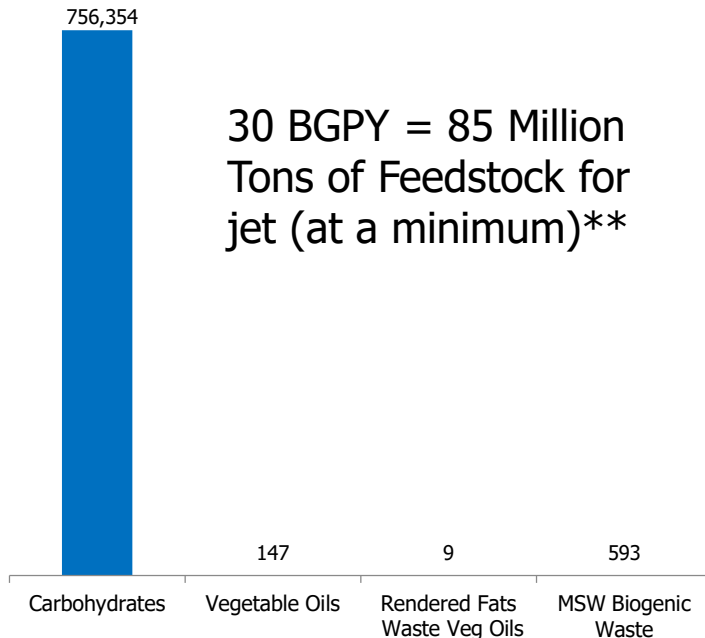
**Even greater savings are possible with the use of wind to offset the emissions due to electricity from the grid**

# PUTTING THE NEED FOR FEEDSTOCKS INTO PERSPECTIVE

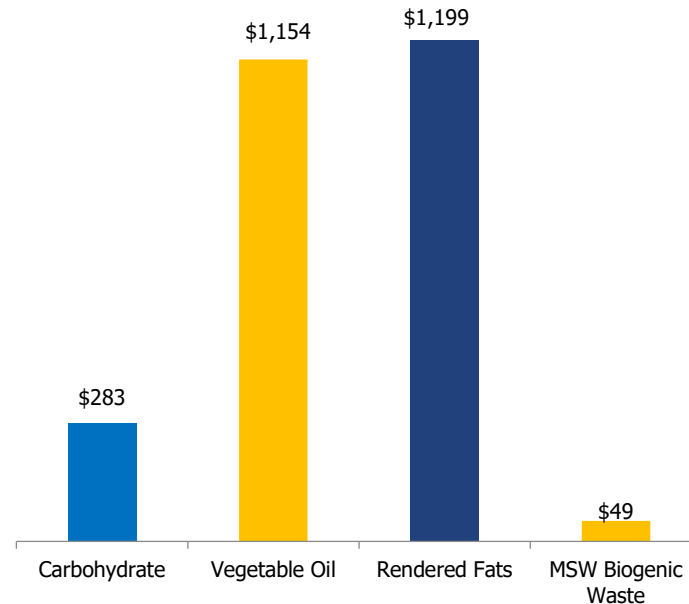


If CO<sub>2</sub> is the carbon source we will have to grow raw materials (directly or indirectly)!!!

**Feedstock Availability (MMT)**



**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  
\*\*Assumes 33% yield from raw materials which is an overly optimistic. A realistic amount likely would be several times higher,*

*Source: 2010/2011 USDA Foreign Agriculture Service (FAS), NRA 2015, USDA ERS Oil Crop Yearbook 2015/16, World Bank Global Review of Solid Waste Management 2012*

# PRODUCING FUELS AND HELPING THE FOOD SUPPLY CHAIN



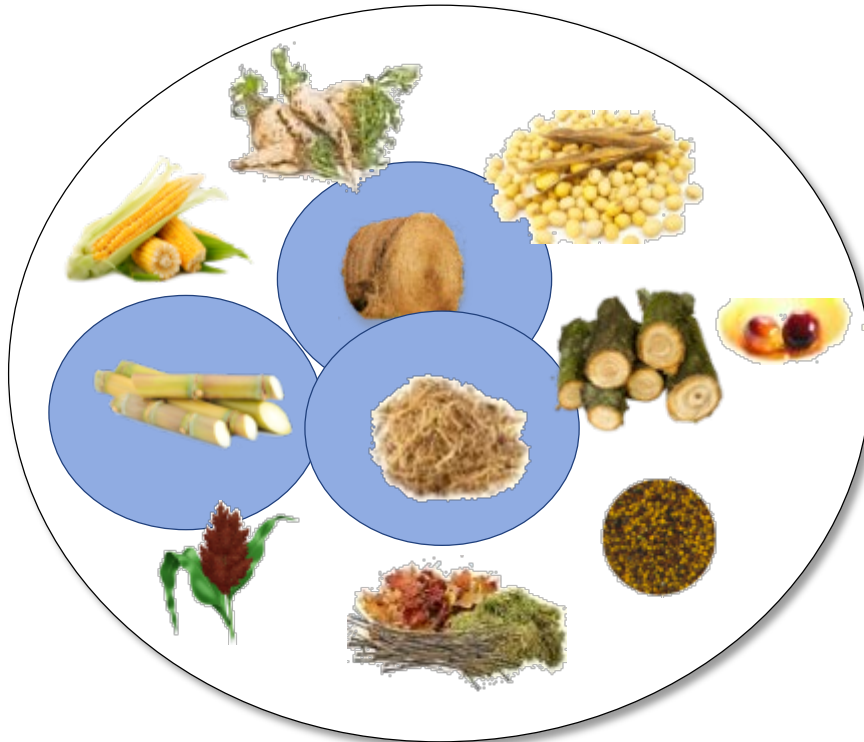
Which of these feedstocks contribute to protein in the food chain?



**Corn: ~5 KG of Animal Feed and Protein Produced for Every Gallon of Jet Fuel or Isooctane**

# CANE, MOLASSES, BAGASSE, AND STRAW

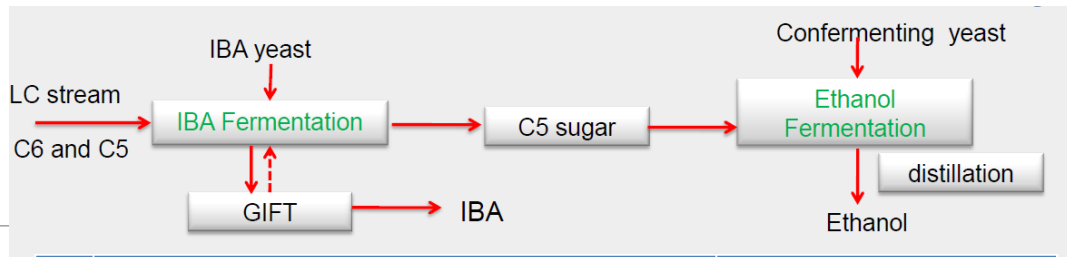
Praj has adapted our technology to broaden the available feedstocks



Praj has developed the process technology for using molasses and or sugar. Together Gevo and Praj are ready to license the technology

The process for using bagasse or straw is still in development and looks very promising

Partner for anything we do in India



# CELLULOSIC FEEDSTOCKS ENABLE GREATER BIOFUEL PRODUCTION



Partnership with Renmatix expected to enable cellulosic feedstocks, increase diversity of feedstocks, and global reach



Future utilization of **sustainable cellulosic** feedstocks allow Gevo to further develop the biofuel market on a global scale

## FACTS ON GEVO'S SUSTAINABLE AVIATION FUEL

- Gevo's Alcohol to Jet Synthesized Paraffinic Kerosene (ATJ-SPK) pathway was approved by ASTM in April 2016
  - Drop-in fuel, with a blend limit of 50%
  - No Sulfur, no particulates, and an undetectable freezing point
  - Higher energy density
  - Up to 70% GHG reduction per gallon
- First carbohydrate based ATJ commercialized
- Gevo has demonstrated the use of 50/50 ATJ on an F/A -18 "Hornet" in supersonic flight in 2014, as well as all US fighters and helicopter platforms
- First flight ever utilize cellulosic feedstock for ATJ with Alaska Airlines
- Many companies, and the military, have used Gevo ATJ





# GEVO'S FLY GREEN DAY AT O'HARE

- First time renewable jet was supplied to O'Hare using on & off airport infrastructure
- Proved that the blending, pipelines, certification were economical and practical
- Eight airlines and FedEx participated and flew the renewable fuel



- Demonstrated and set the precedent that commercial supply logistics is possible



# GEVO AND VIRGIN AUSTRALIA FLY GREEN DAY IN BRISBANE



- Initial portion of a 12-18mo project
- Partnership between Virgin Australia, Gevo, Queensland Gov't, Caltex, & Brisbane Airport
- First time renewable jet was supplied in Australia using the general fuel supply system
- Biojet has now been used to fuel 195 domestic and international flights out of Brisbane



## GEVO'S AND AVFUEL FLY GREEN DAY AT VAN NUYS

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- Business Jets Fuel Green: A Step Toward Sustainability
  - Van Nuys is one of the worlds busiest general aviation airports
- Renewable jet fuel has a market outside airlines
  - Demand in general aviation and business travel
- A fully collaborative effort between:
  - Gevo
  - Avfuel Corporation
  - Bombardier Business Aircraft
  - Phillips 66
  - World Fuel Services
  - General Aviation Manufactures Association, International Business Aviation Council, Van Nuys Airport Association, National Air Transportation Association, National Business Aviation Association
- Demonstrates the general aviation industries commitment to emissions reduction and aim for carbon neutrality from 2020 forward

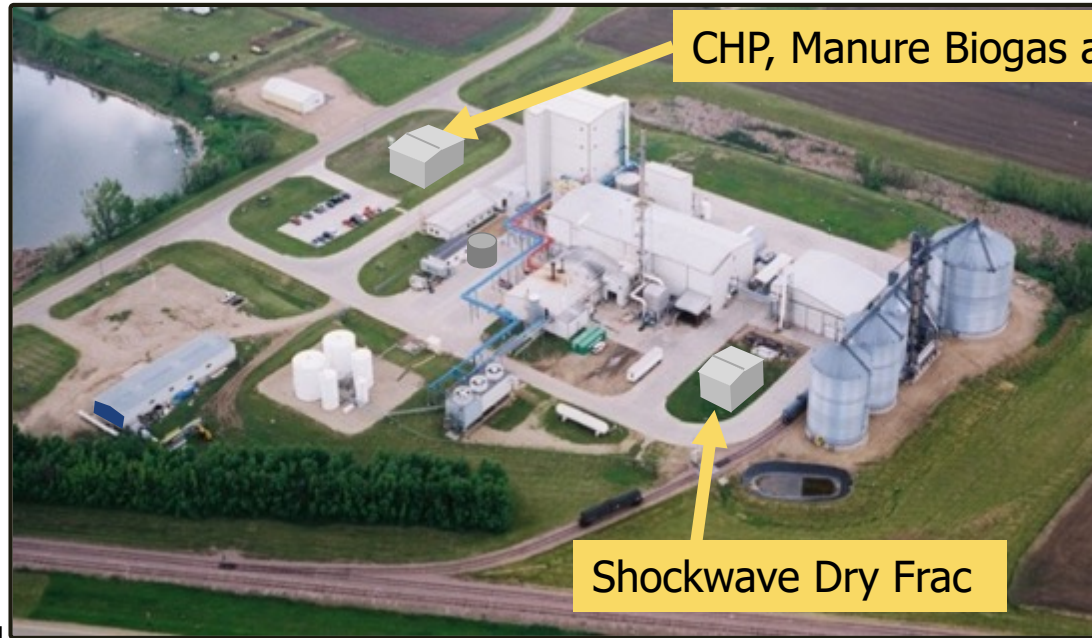


# Production

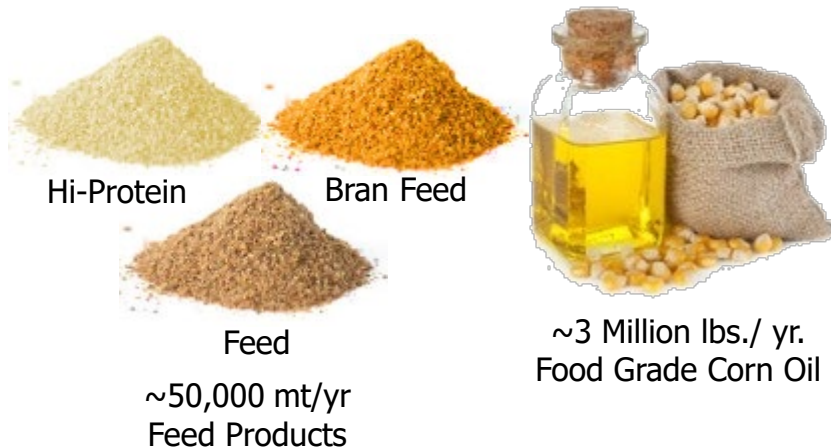
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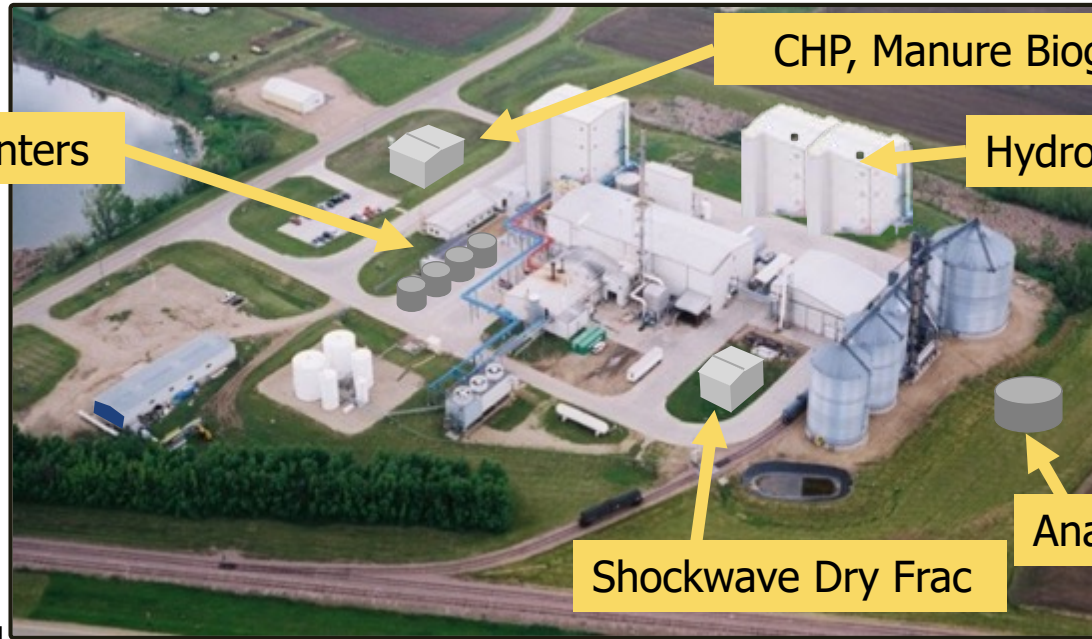
# STEP 1- ROAD MAP TO SCALE: SETTING UP LUVERNE FOR LOW CARBON AND ENHANCED PROTEIN PRODUCTS



## Products Sold



# STEP 2- ROAD MAP TO SCALE: BUILD OUT IBA AND HYDROCARBONS (JET AND ISOCTANE)



New IBA Fermenters

CHP, Manure Biogas and/or Wind

Hydrocarbon Plant

Shockwave Dry Frac

Anaerobic Digestion

## Products Sold



**~100,000 tons/yr  
Feed and related products**



**~6 Million lbs./ yr.  
Food Grade Corn Oil**



**~1-3 MGPY  
IBA**

**~8 MGPY  
Jet Fuel**

**~2 MGPY  
Isooctane**

**~20-26 MGPY  
EtOH**

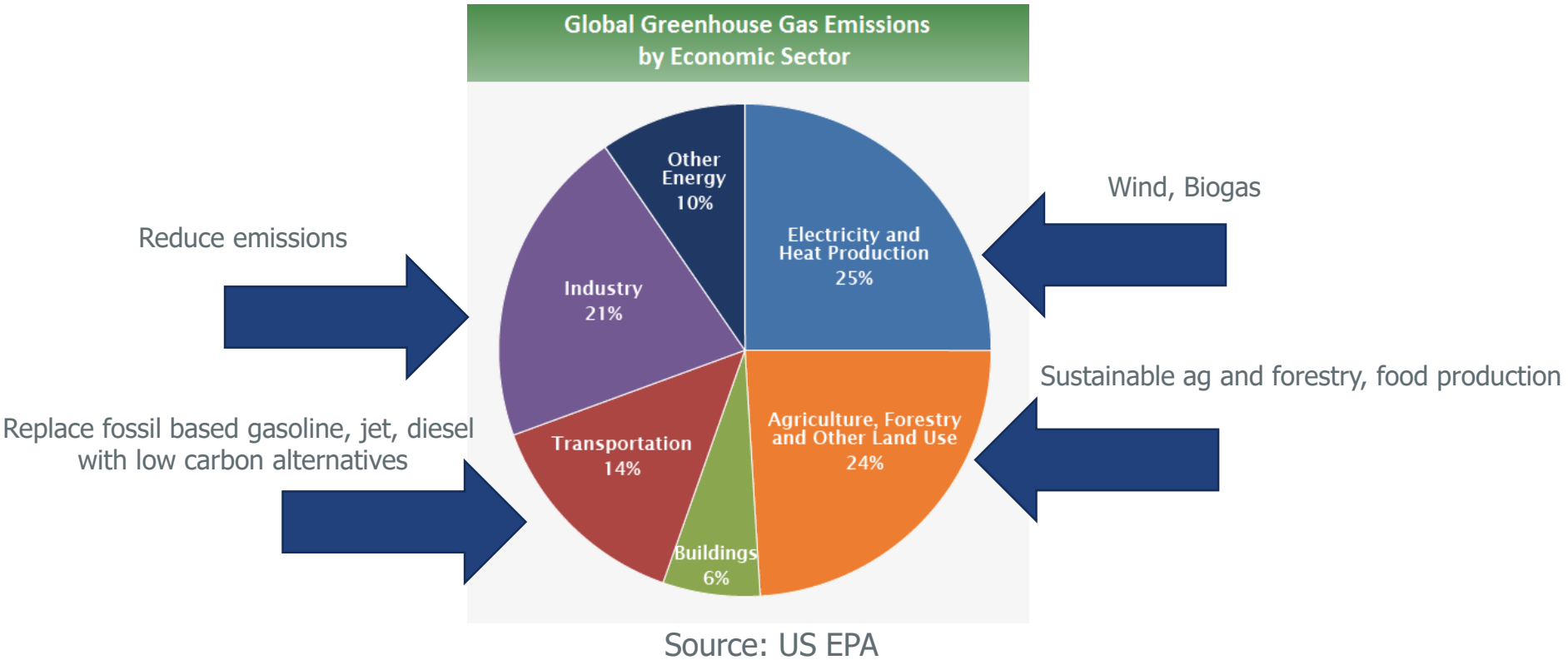
# IF WE ARE GOING TO PRODUCE VERY LARGE QUANTITIES OF SUSTAINABLE LOW CARBON JET FUEL...

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- **Land is needed to generate the carbon for fuels, so “sustainable practices” must be required**
  - Growing and harvesting
  - Carbon capture in soil
  - Ground water and run off protection
  - Cover crops where practical
  - Incentives for more yield per unit of land
  - Other?
  
- **The value chain must be constructive to food chain where possible, and never detrimental**
  
- **The products must work**
  - ✓ Must meet performance requirements
  - ✓ Must be proven to work in existing infrastructure
  - ✓ Must be made from renewable carbon and have a GHG benefit
  - ✓ Must be economical
    - ✓ Able to obtain RINS
    - ✓ Able to obtain other carbon credits
  - ✓ Must use a scalable, de-risked technology

# WE CAN DRIVE GHG REDUCTION IN MULTIPLE SECTORS



**By establishing business systems that reward sustainability, we can drive change.**



Thank You

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**PAST**  
**FUTURE**