Illinois Clean Fuels

Better Fuels for a Better Future

Municipal Solid Waste to Jet Fuel + Carbon Capture and Storage:

New Feedstocks Better Fuels Carbon Removal

The Enercom Oil & Gas Conference, August 17 2021

Forward Looking Statements

THIS DOCUMENT INCLUDES FORWARD LOOKING STATEMENTS AND OTHER INFORMATION BASED ON ASSUMPTIONS AS TO FUTURE EVENTS THAT ARE INHERENTLY UNCERTAIN.

THESE FORWARD LOOKING STATEMENTS ARE PREDICTIONS, NOT GUARANTEES, AND INVOLVE A NUMBER OF RISKS, UNCERTAINTIES, ASSUMPTIONS AND OTHER IMPORTANT FACTORS THAT MAY CAUSE THE COMPANY'S ACTUAL RESULTS OR PERFORMANCE TO BE MATERIALLY DIFFERENT FROM THOSE EXPRESSED OR IMPLIED BY THESE FORWARD LOOKING STATEMENTS.

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Illinois Clean Fuels Will Be A Low-Cost Producer of Climate-Beneficial Sustainable Aviation Fuel

Production Capacity:

- 30,000 BPD of jet fuel and naphtha (414,000,000 gallons per year)

Unsubsidized Breakeven Production Cost (ex LCFS, RFS, BTC):

- $49/bbl Brent Crude Equivalent

Asset Life:

- 40+ Years. **<u>NO DECLINE CURVE!</u>**

Lifecycle Carbon Intensity:

- Very far below zero
- -198% - -253% vs conventional jet A (depending on whether a landfill or incinerator is eliminated)
- Between (-86) and (-135) gCO_2e/MJ.
- 8.1 Million metric tons per year of CO_2 avoided.

Founding Vision

Produce drop-in replacements for conventional jet and diesel fuel, profitably, without reliance on subsidy

Optimize environmental/climate performance

Deploy the best available proven off the shelf technology
(We are project developers, not technology R&D)

The Imminent "New Normal":

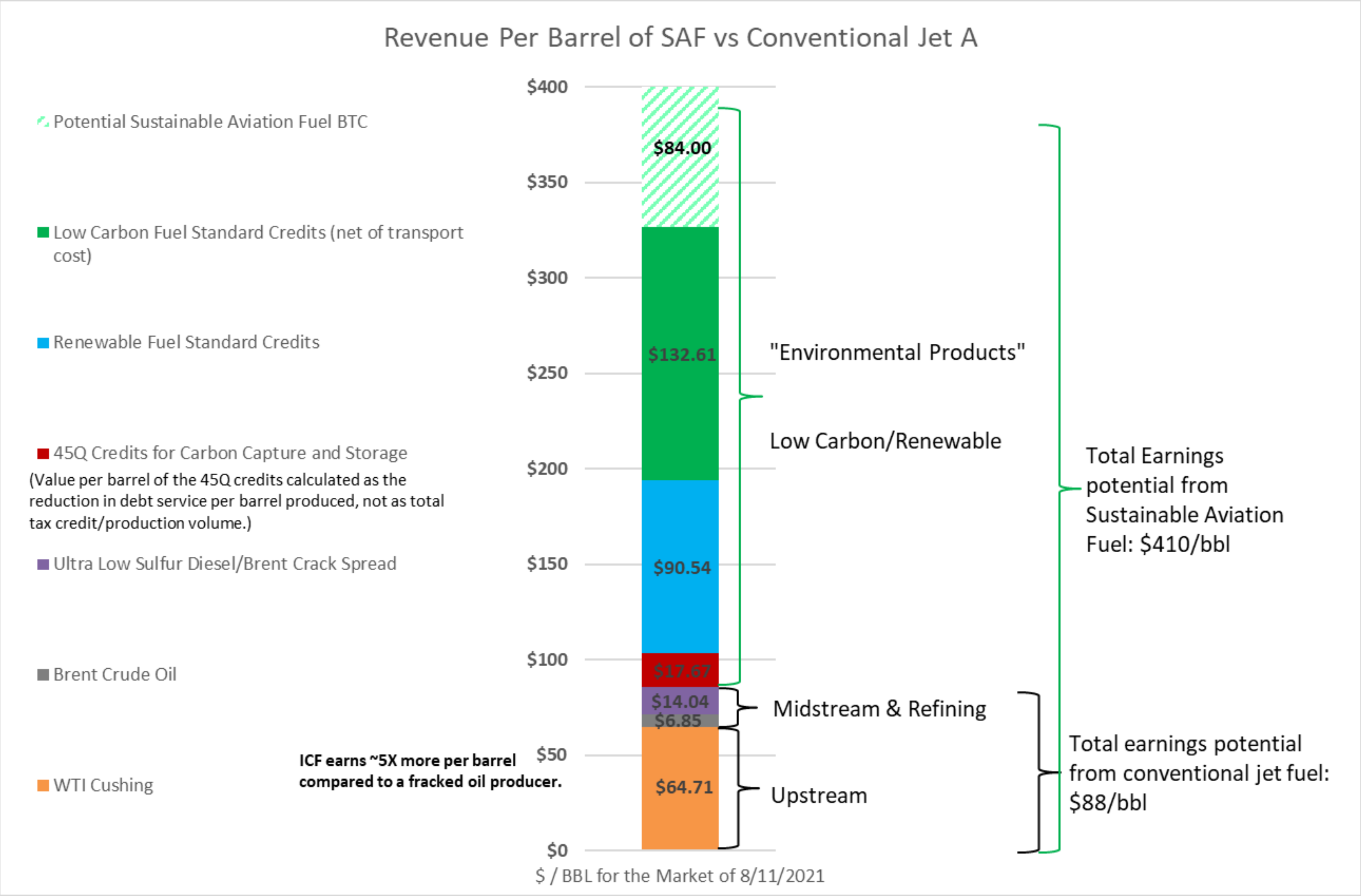
Climate impacts will no longer be an "externality"

In fuels, Carbon Intensity is going to become as important as sulfur content or API gravity in fuel pricing.

In MSW treatment, climate will become a key stakeholder requirement and (if not well managed) a major cost center.

Carbon-Negative Sustainable Aviation Fuel earns over 4x more per barrel more than Jet A

Why care about climate?



Jet A: $88/bbl

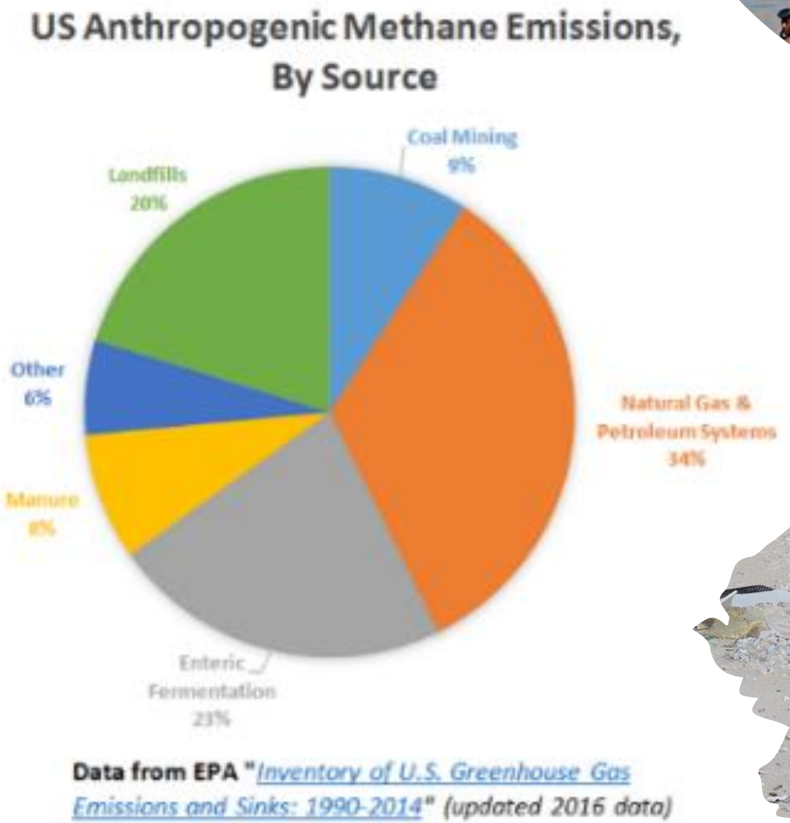
Ultra-low Carbon Intensity Sustainable Aviation Fuel: $410/bbl

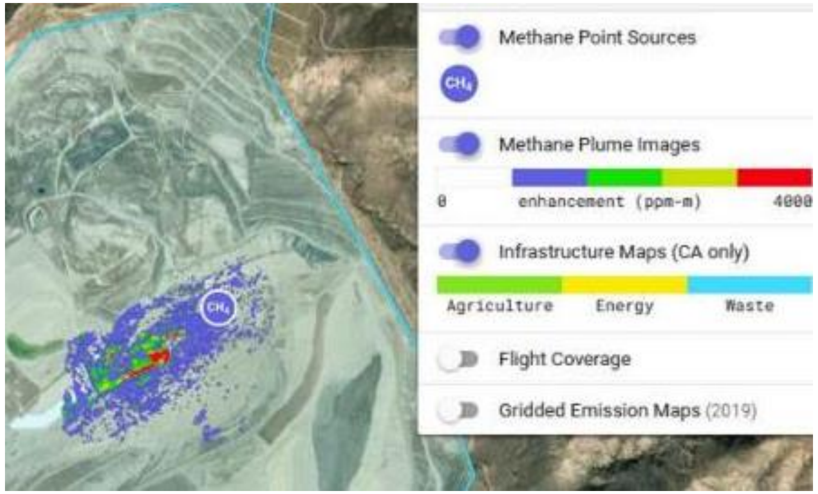
Tons of avoided lifecycle carbon are worth a lot of money!

Improper Disposal of Waste Has Catastrophic Impacts on The Environment, Human Health, and Global Climate

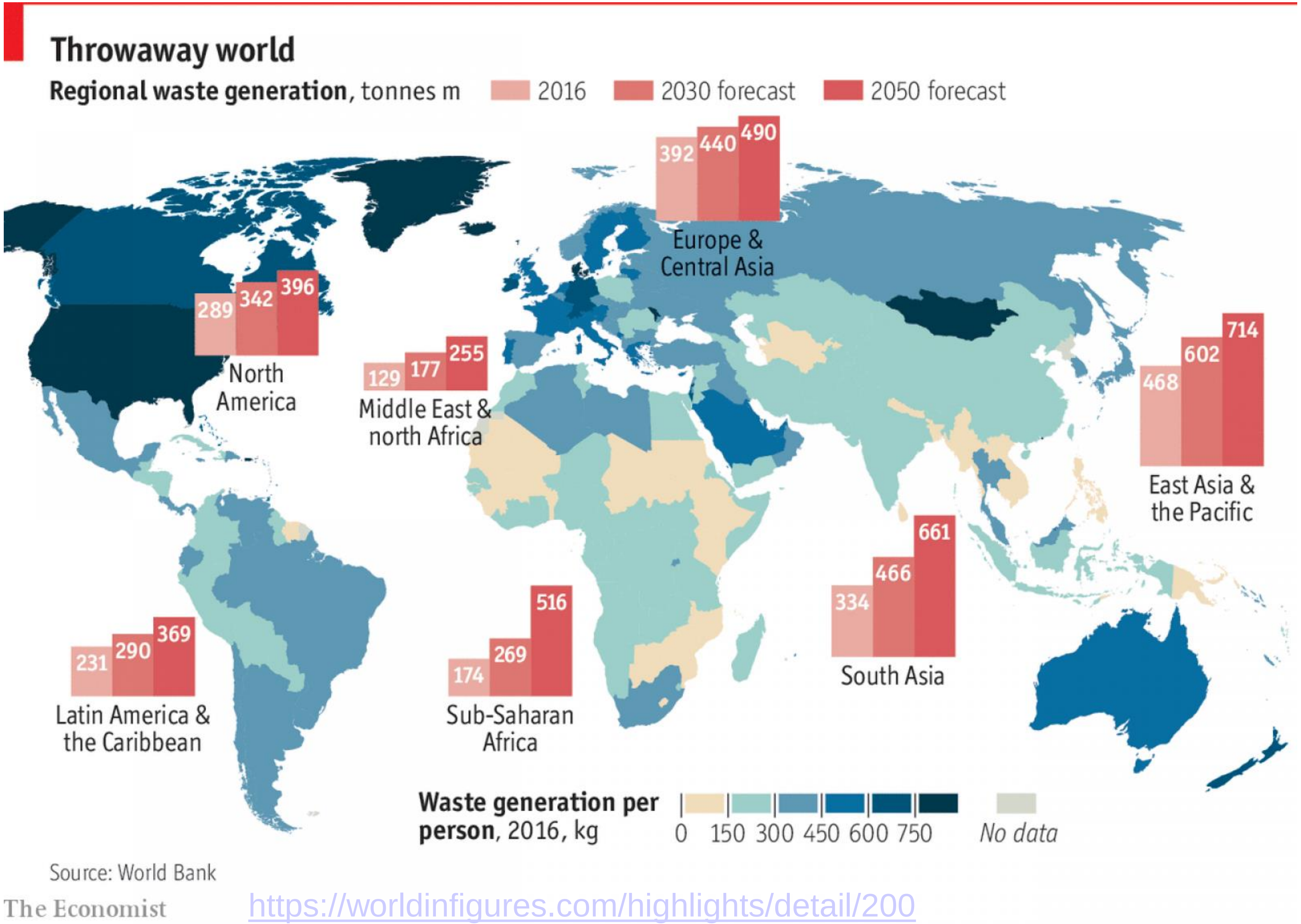
Landfills are third largest source of US methane emissions.

Methane is 87X more damaging than CO2 in climate impact.



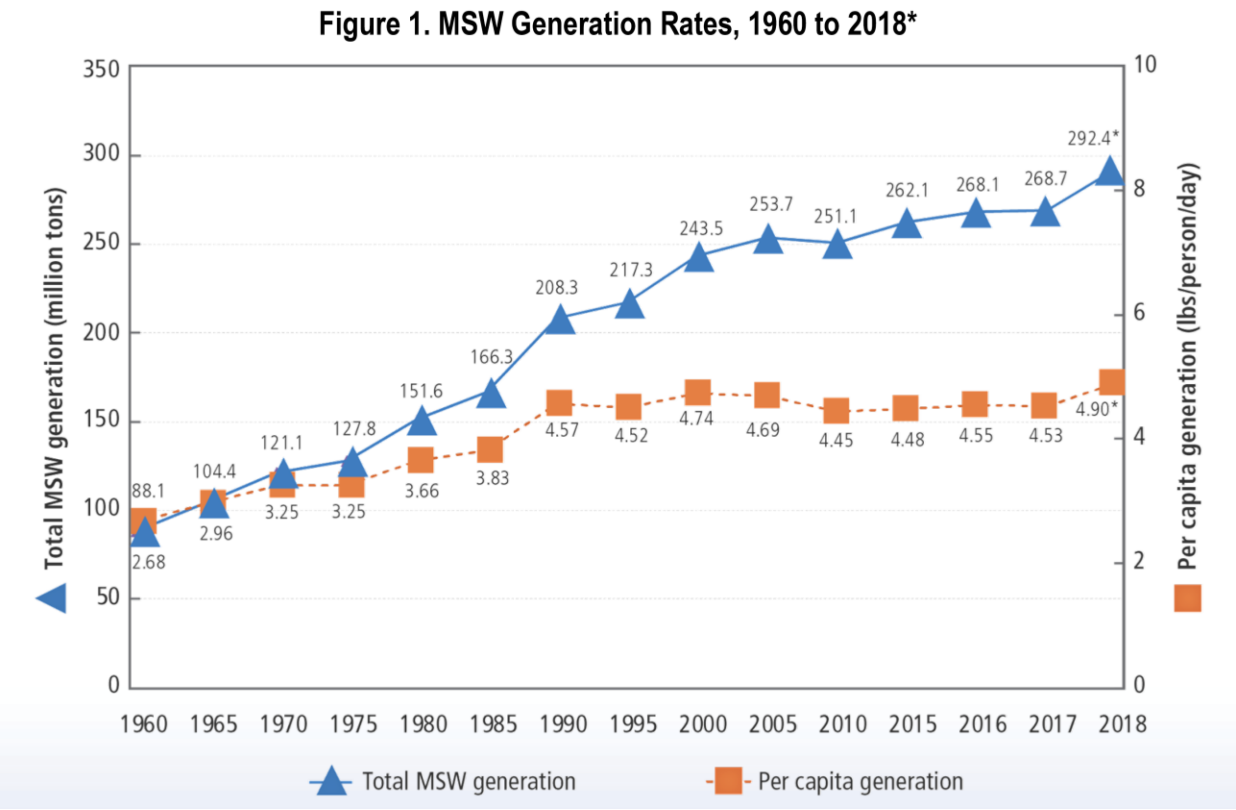


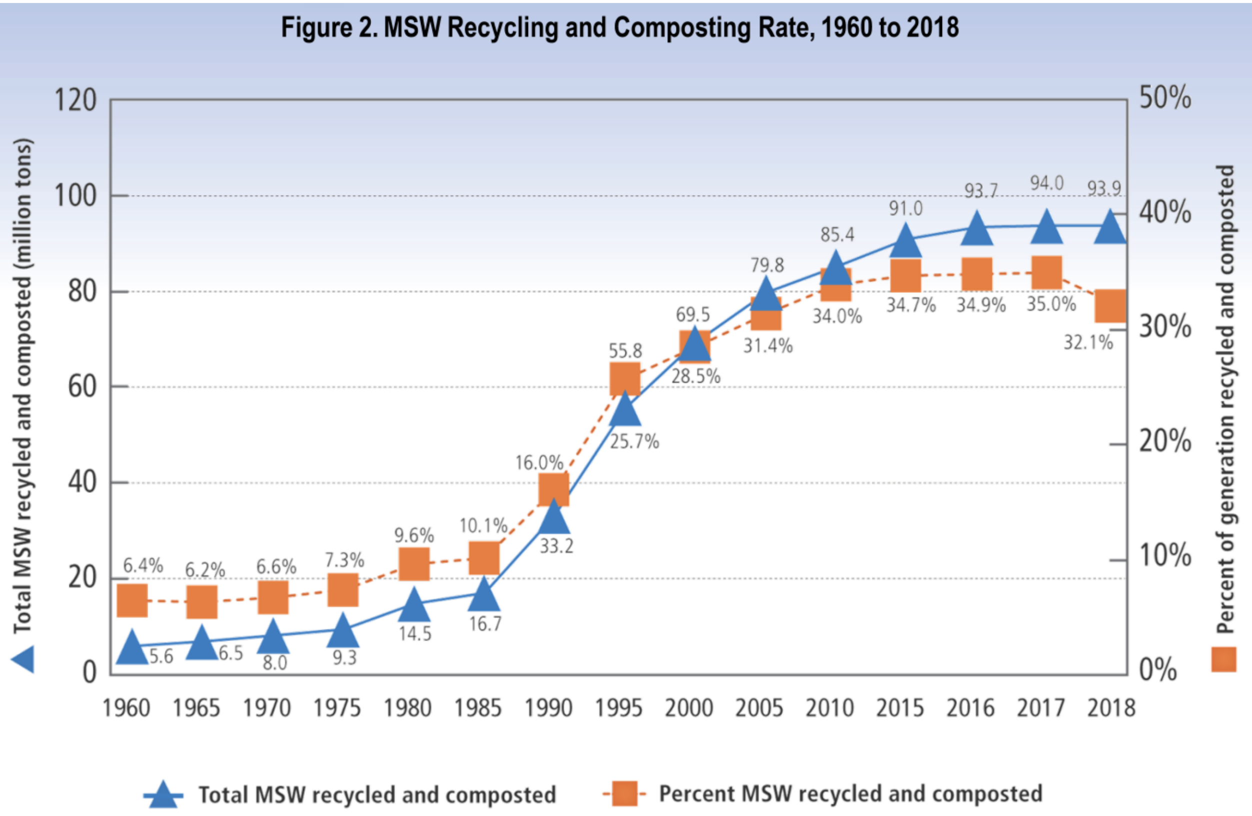
Waste is a Growing and Global Problem.
Worldwide Garbage Generation is Set to Double By 2050



https://worldinfigures.com/highlights/detail/200

The US Is Generating More Waste Than Ever Before.
4.9 Pounds Per Person Per Day.
And Our Recycling Rate is Falling.

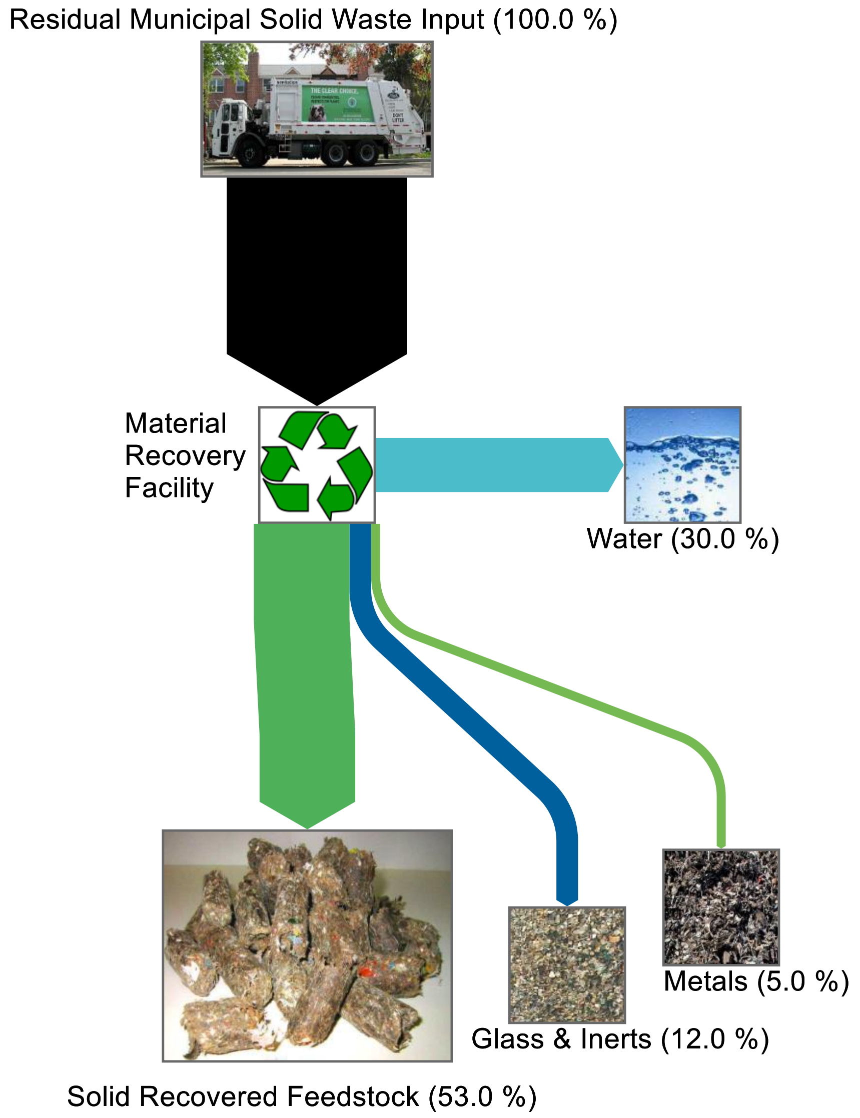




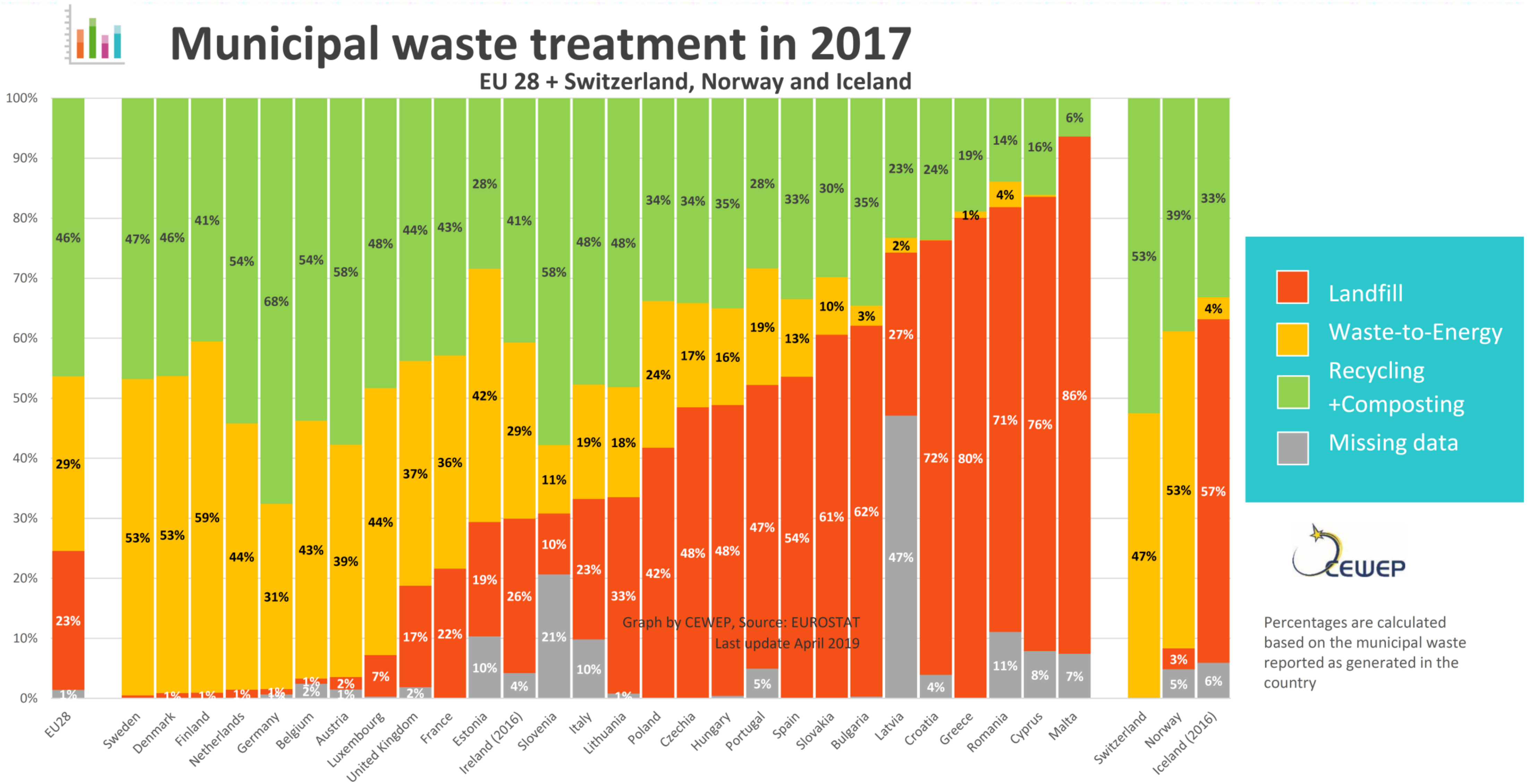
The USA is the Saudi Arabia of Garbage!

Feedstock

"Waste" is Simply Energy & Raw Materials That Have Not Been Properly Recovered



Achieving Zero Waste To Landfill Requires Use Of The Energy Fraction



Eliminating landfills without Waste To Energy conversion of the nonrecycleable residuals has never been done.

The Oil & Gas and Municipal Waste Industries Can Help Lead the Global Energy Transition

Size of The Opportunity by 2050:

North America

Waste volume supports 35 plants
1,050,000 BPD of fuel production

336 million TPY of CO2e emission reduction

Worldwide

Enough feedstock to support 306 plants worldwide,

9 million BPD+ of fuels
~ 3 gigatons CO2e per year of emissions reduction

Four Key Technologies:

- Material Recovery Facilities
- Efficient rail & barge logistics
- Synthetic fuel plants
- Carbon capture and storage

When integrated at correct scale

Form a new circular carbon economy.
Creating a highly profitable way to produce jet fuel while eliminating landfills, and capturing and storing CO2.

A better-than-zero climate impact solution for two of the most difficult-to-abate sectors of our economy.

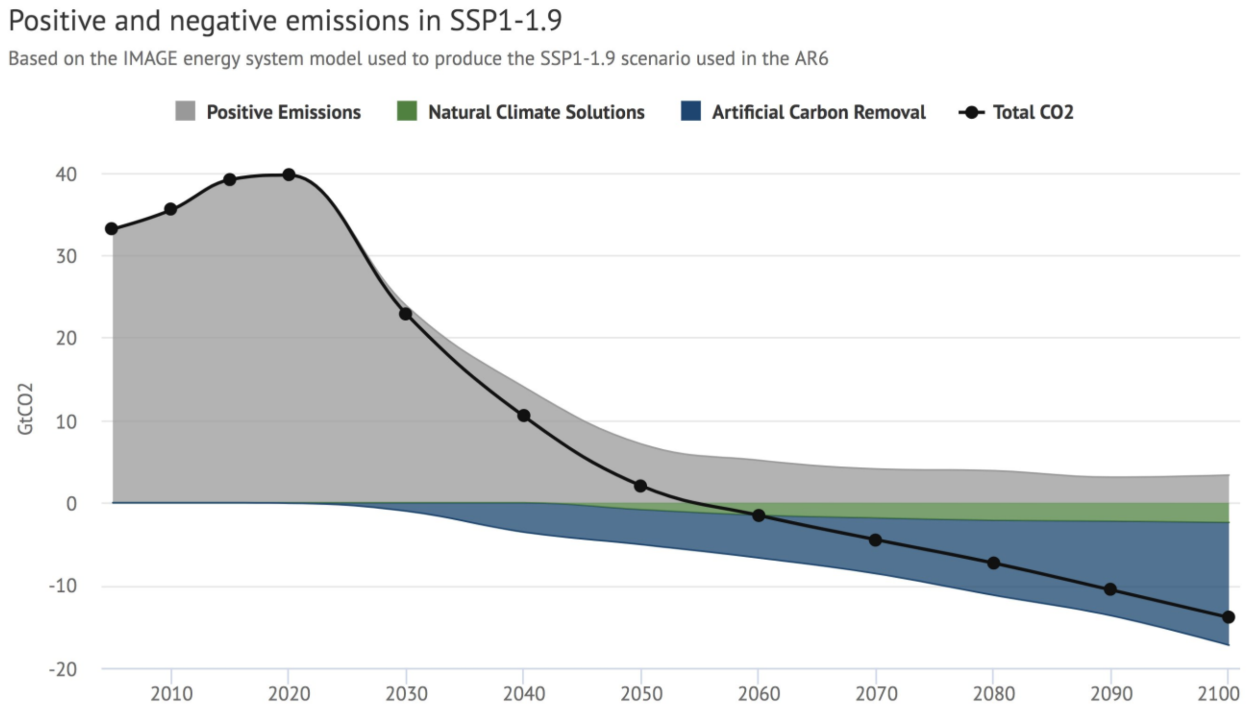
Key Drivers of Our Project

Oil is gradually becoming more difficult and costly to find and produce.

Achieving net zero carbon is a new global design imperative!

Including "difficult to decarbonize" sectors like aviation and municipal solid waste management.

Carbon pricing is coming to every sector of the economy.



"Reductions" are not good enough!
Negative emissions are vital to global climate stabilization

Key Executives

Stephen Johnson
President

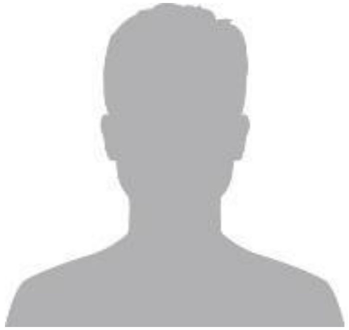
Hedge Fund Background, 15 years in US synthetic fuel project development

Dymah Paige
Chief Financial Officer

Infrastructure PE, Oil and Gas, and Municipal Solid Waste Background

Synfuel Plant Engineering Team

(Name Withheld Due to Current Employment Constraints)
Synfuels Project Director



Gasification & Synthetic fuels, Engineering project management and development

Adrian Popescu
Project Engineering Team

Gasification & Synthetic Fuels Plant Engineering

Waste Feedstock Procurement

John Lamanna
Waste Feedstock Team Lead

40 year top executive background in municipal solid waste

Victor Storelli / Storelli Recycling
Waste Feedstock Team

Pioneer in the US Recycling Industry

Carbon Storage

Scott Marsteller
Carbon Storage Team Lead

Developed ADM Decatur Carbon Storage project for Schlumberger

Government Affairs/Permitting

Sanford Stein
Permitting Counsel and Legislative Affairs

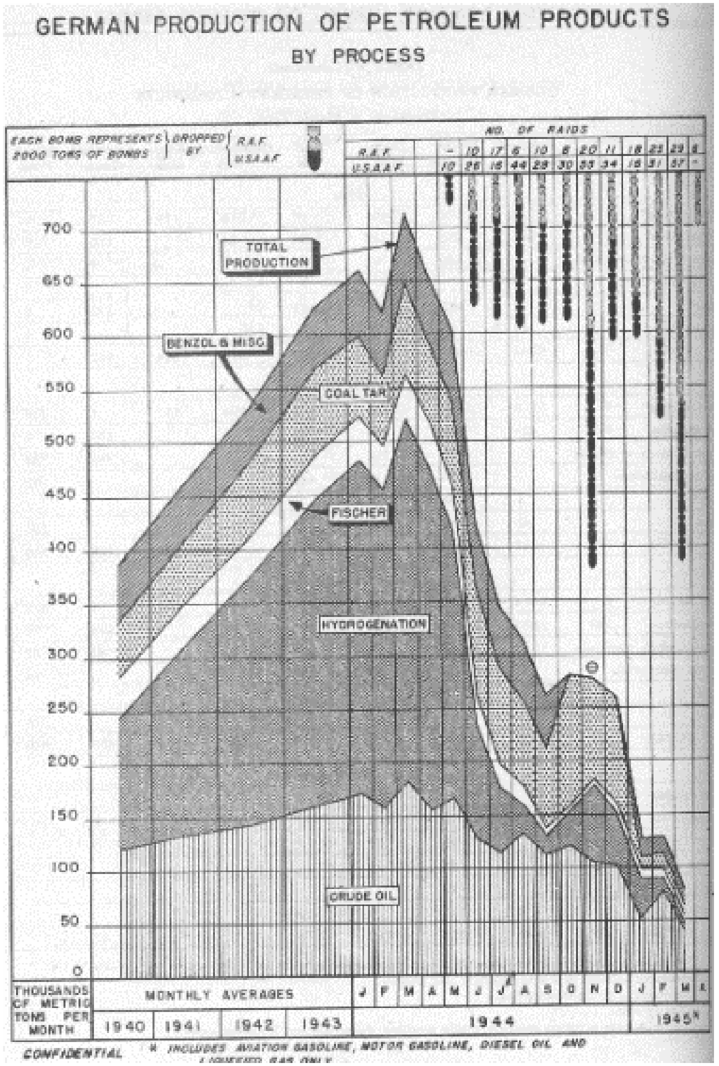
35 years or environmental law/permitting in Illinois

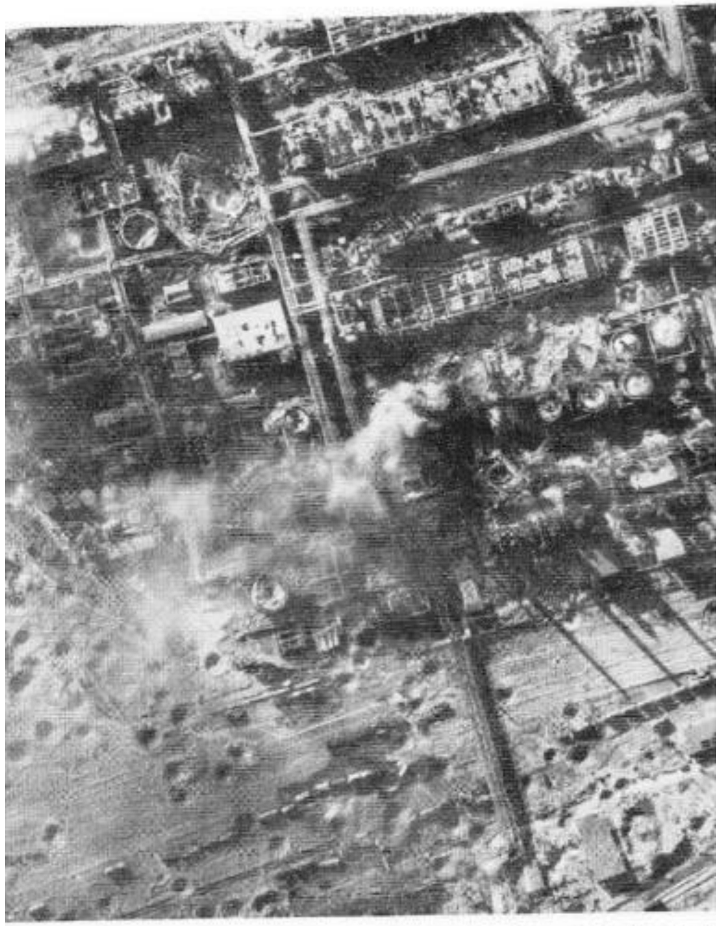
Transport / Logistics

Donald Skelton
Director Transportation and Logistics

40 year top executive career with the class 1 railroads

Synthetic Fuels are Not A New Concept!





A SYNTHETIC OIL PLANT AT BOHLEN
after Bomber Command's attack on 21/22nd March, 194

Synthetic Fuel Technologies Date to Before WW2, and Were Proven At Scale in the 1930s

The Tech Has Since Been Improved and Further Scaled Up. Here Are A Few Examples:

700,000+ Barrels Per Day From 10+ Existing Plants

South Africa: 2 plants, 190,000 BPD

The head of our technology team ran this facility's chemical division for 8 years.

China: 616,000 BPD across several plants planned by 2020. 4 active, others under construction.

Malaysia: 1 plant, 14,700 BPD

Nigeria: 1 plant, 34,000 BPD

Qatar: 2 plants, 170,000 BPD

Process

Proven Technology

Competitive Unsubsidized

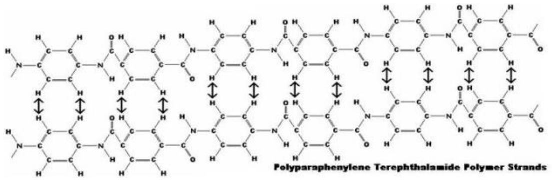
Synthetic Fuel Technologies Convert Hydrogen and Carbon to Diesel and Jet Fuel

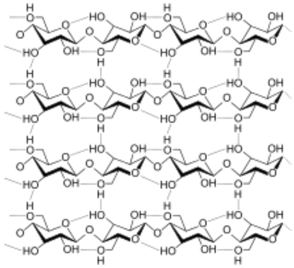
(Regardless of Where That Hydrogen And Carbon Came From)

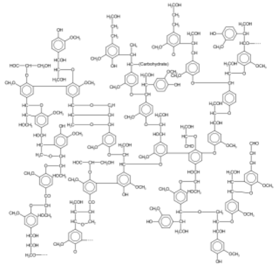
Waste/Biomass

Coal

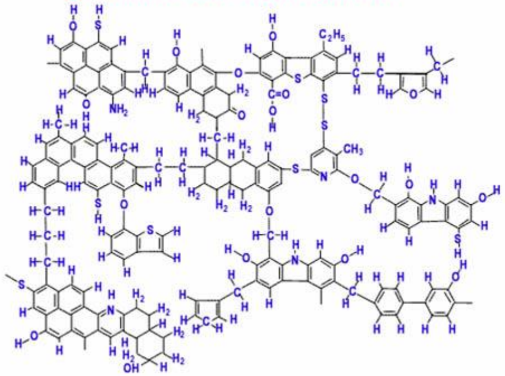
Natural Gas

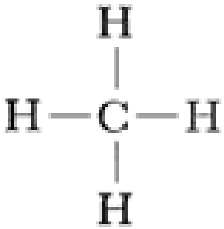






Bituminous Coal Representation





methane

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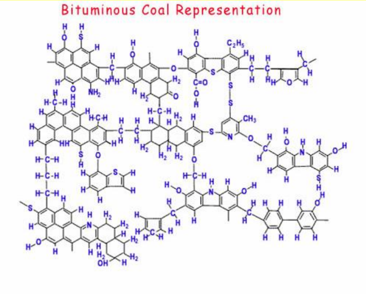
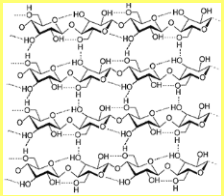
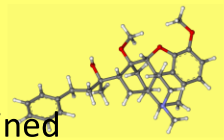
Synthetic Fuel Plants Break The Solids Down Into Hydrogen and Carbon, Then Use Those Building Blocks to Assemble Refined Fuels and Products

Chemistry

Inputs: Coal and Biomass from Garbage
(Biomass with Some Synthetics Mixed In)

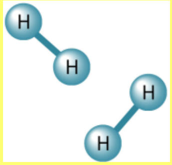


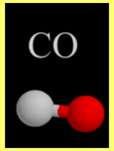




A Chemical Soup of Combined Hydrogen and Carbon

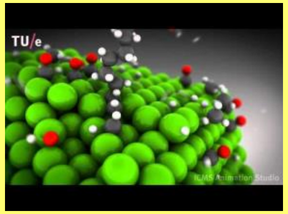
Raw Materials



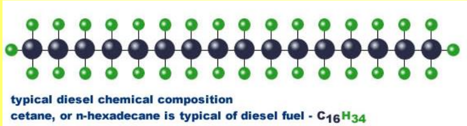


Syngas: Our chemical building blocks
(Hydrogen and carbon in a specific ratio)

Fuel Assembly with a Catalyst



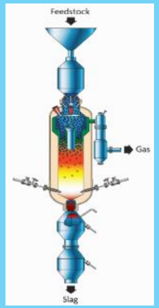
Finished Product



Process

Offsite Municipal Waste Collection & Preparation

Petroleum Coke From Oil Refining

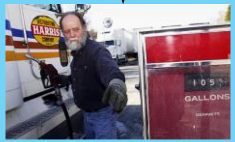


Gasification
(Disassembles solids into raw materials)

Fuel Synthesis
(Fischer Tropsch Conversion)

Product Storage & Distribution

Pipeline Distribution



Diesel Fuel Product

Jet Fuel Product

Carbon Capture, Transport, and Storage

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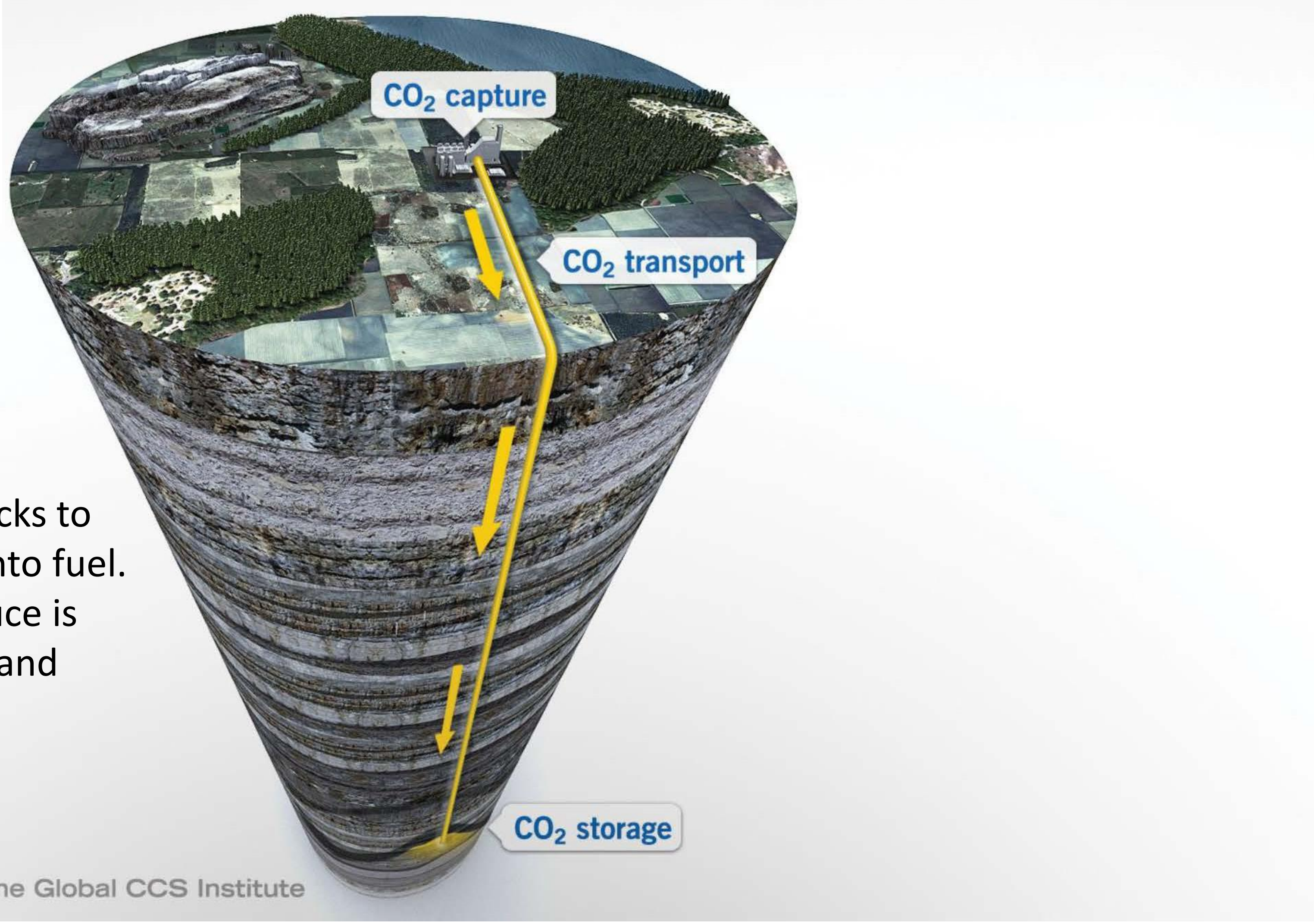
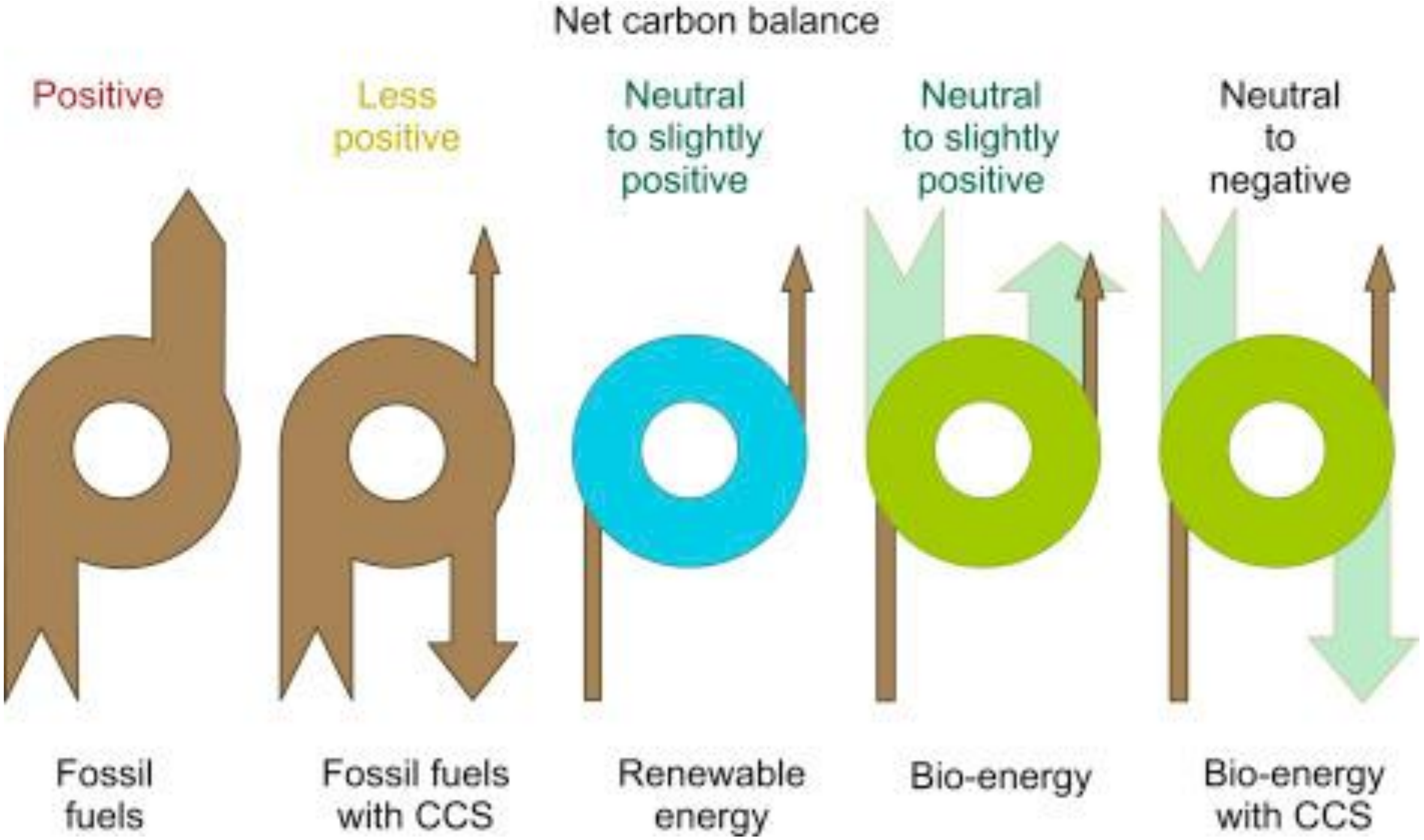


There is not enough hydrogen available in the waste feedstocks to convert all the CO2 in waste into fuel. The excess CO2 that we produce is captured and stored securely and permanently in deep geologic reservoirs.

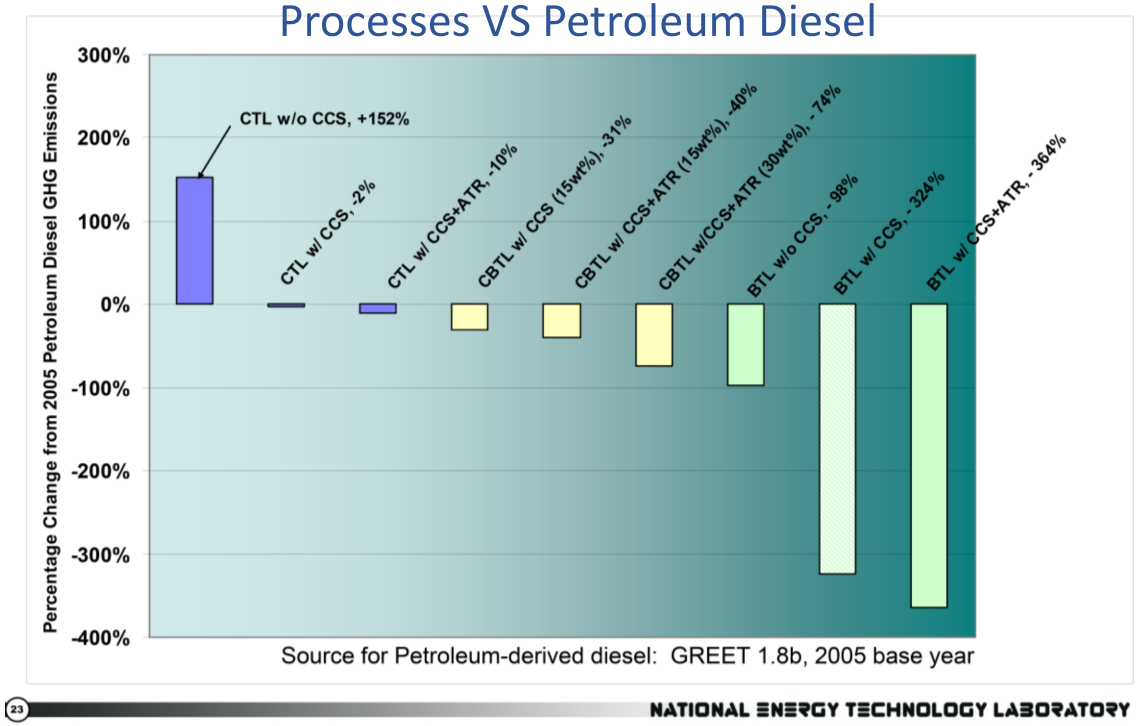
Getting to Zero Or Better: A Circular Carbon Lifecycle Requires The Integration Of Carbon Capture and Storage

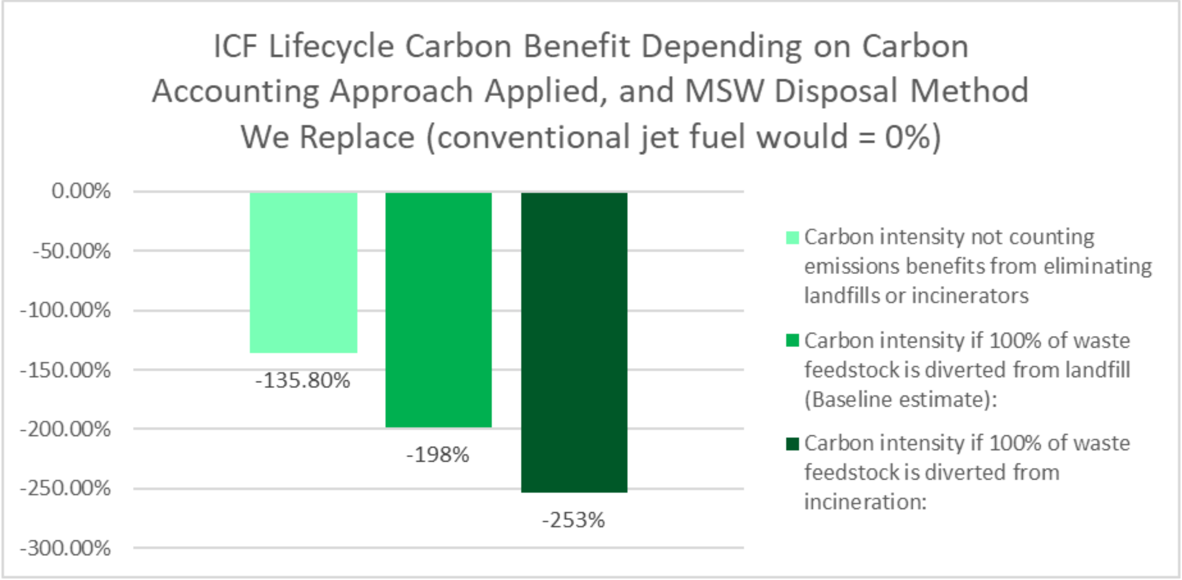


Feedstock

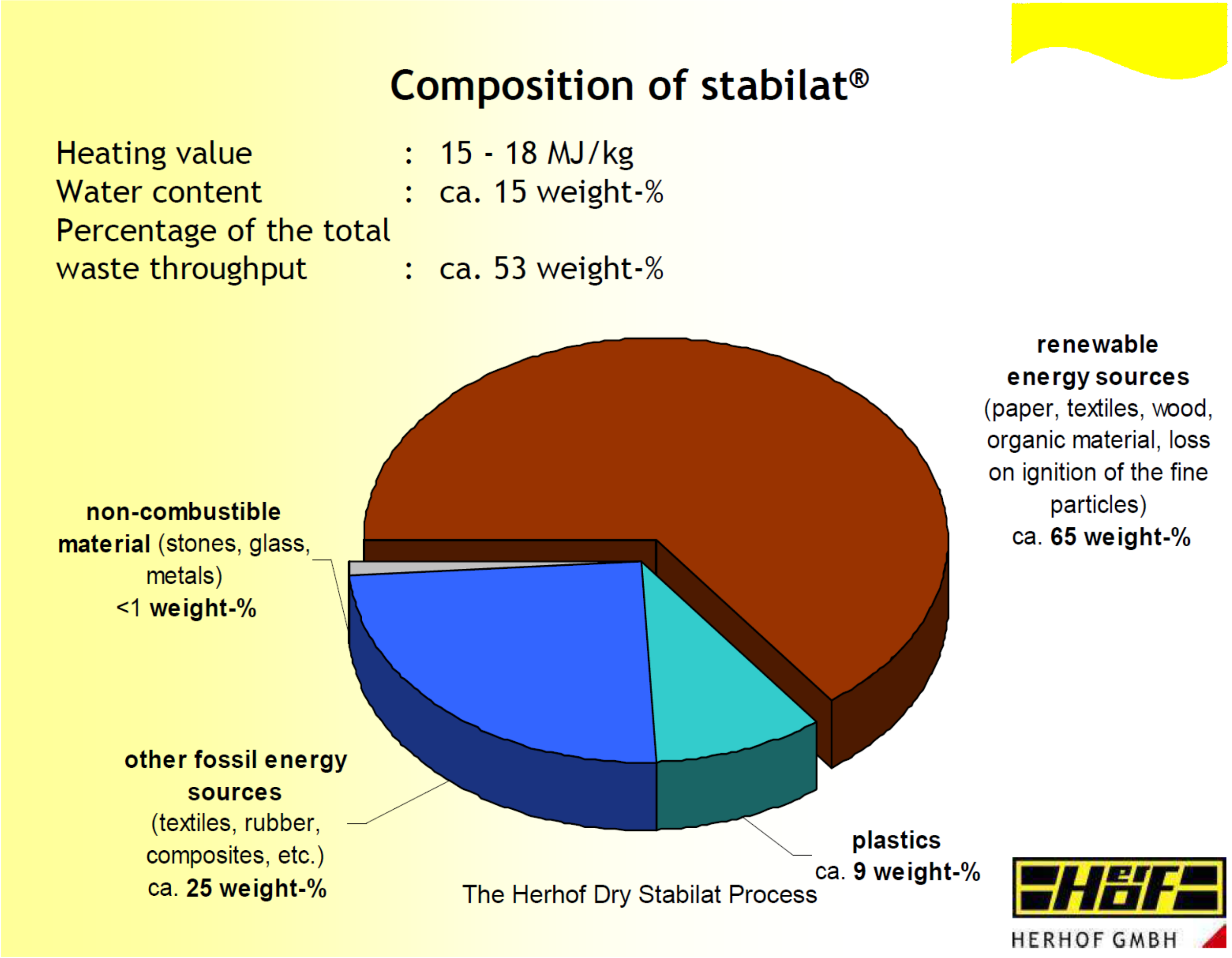
Synthetic fuels: Either climate hero, or climate villain, depending on feedstock and process design

Lifecycle Climate Footprint of Various Synthetic Fuel Processes VS Petroleum Diesel

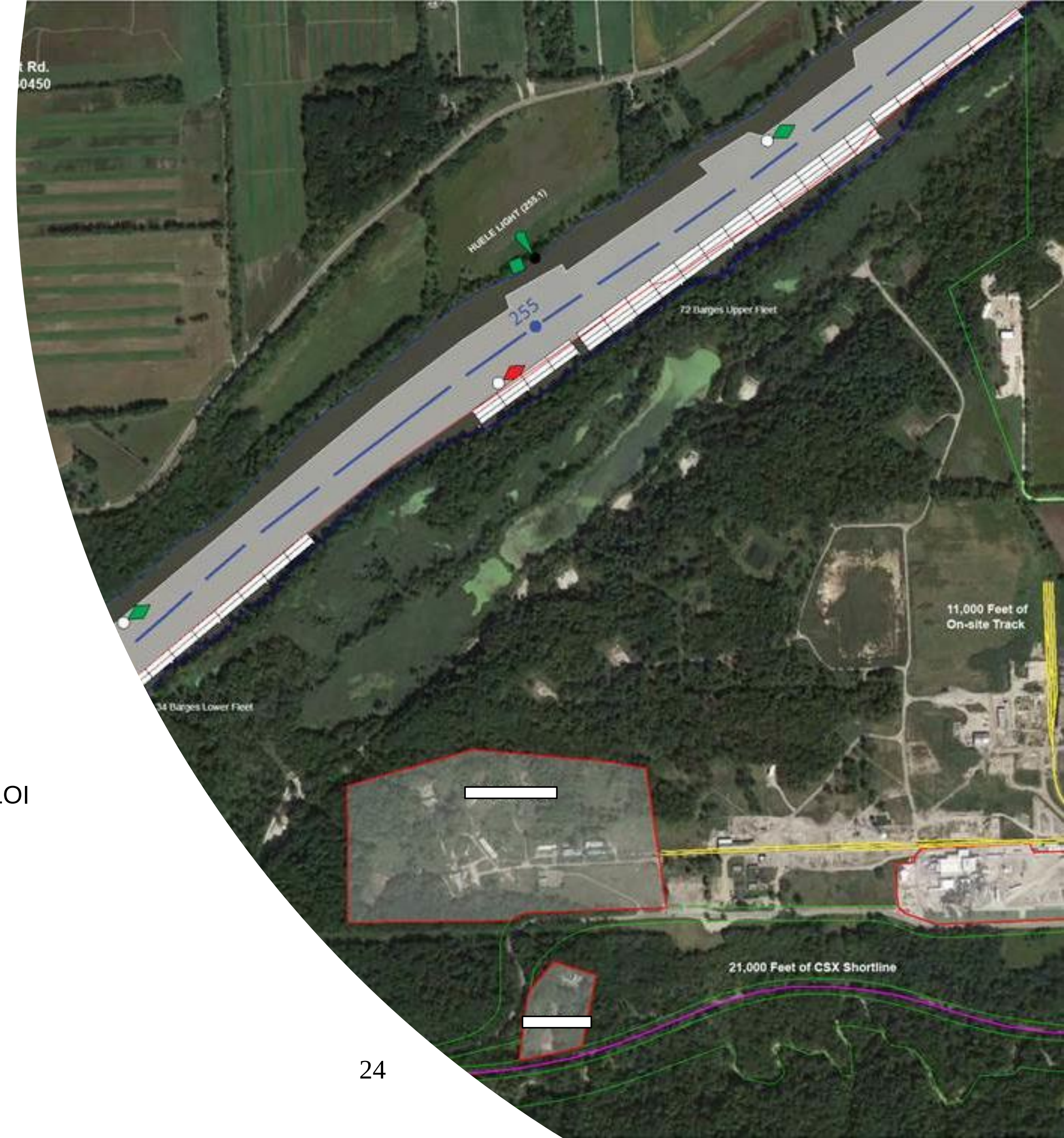




Waste is 65% Biogenic Carbon!



ICF Project Development Status



Site

Identified

Terms Agreed

Bankable Offtake

Agreement with oil major for first 7500 BPD

Feedstock

50% of phase 1 requirements under LOI

Why ICF?

- Scale / Low Production Cost
- CCS Integration / Ultra-Low Carbon Intensity
- Use of MSW as an abundant and low-cost biogenic feedstock
- Efficient design eliminates problematic byproducts like tars or fly ash

The Challenges / Tradeoffs

Low production cost requires scale

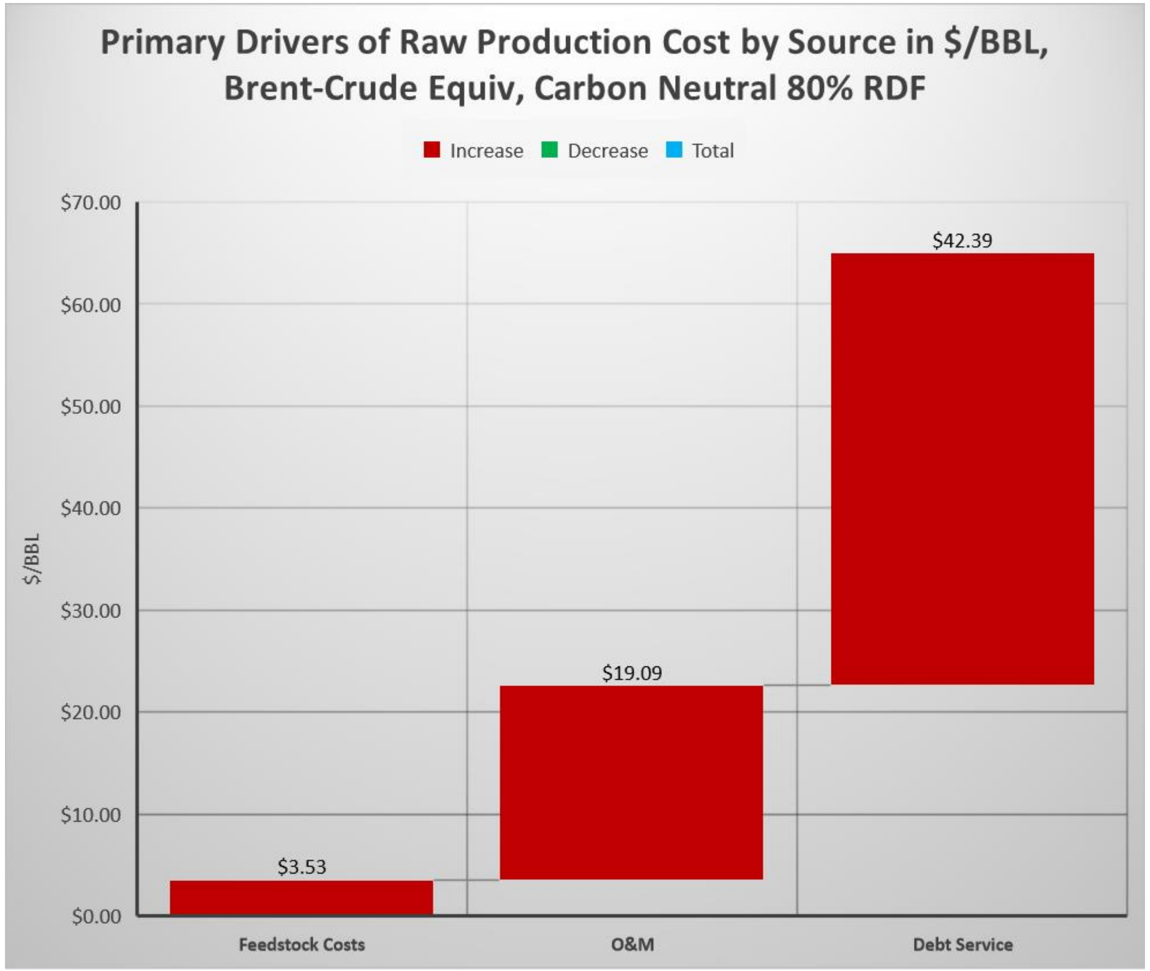
Scale requires large volumes of feedstock. More than can be sourced from a single city.

Carbon storage requires specific geology, limiting site options

Efficient intermodal logistics is key!

The Three Primary Drivers of Synthetic Fuel Production Cost

- Feedstock Costs
  (very low because the money upstream MRFs are paid to take waste offsets processing and transport costs of feedstock procurement)
- Operation & Maint. Costs
- Capital Costs
  Capital Costs are by far the largest contributor, reflected as debt service costs!



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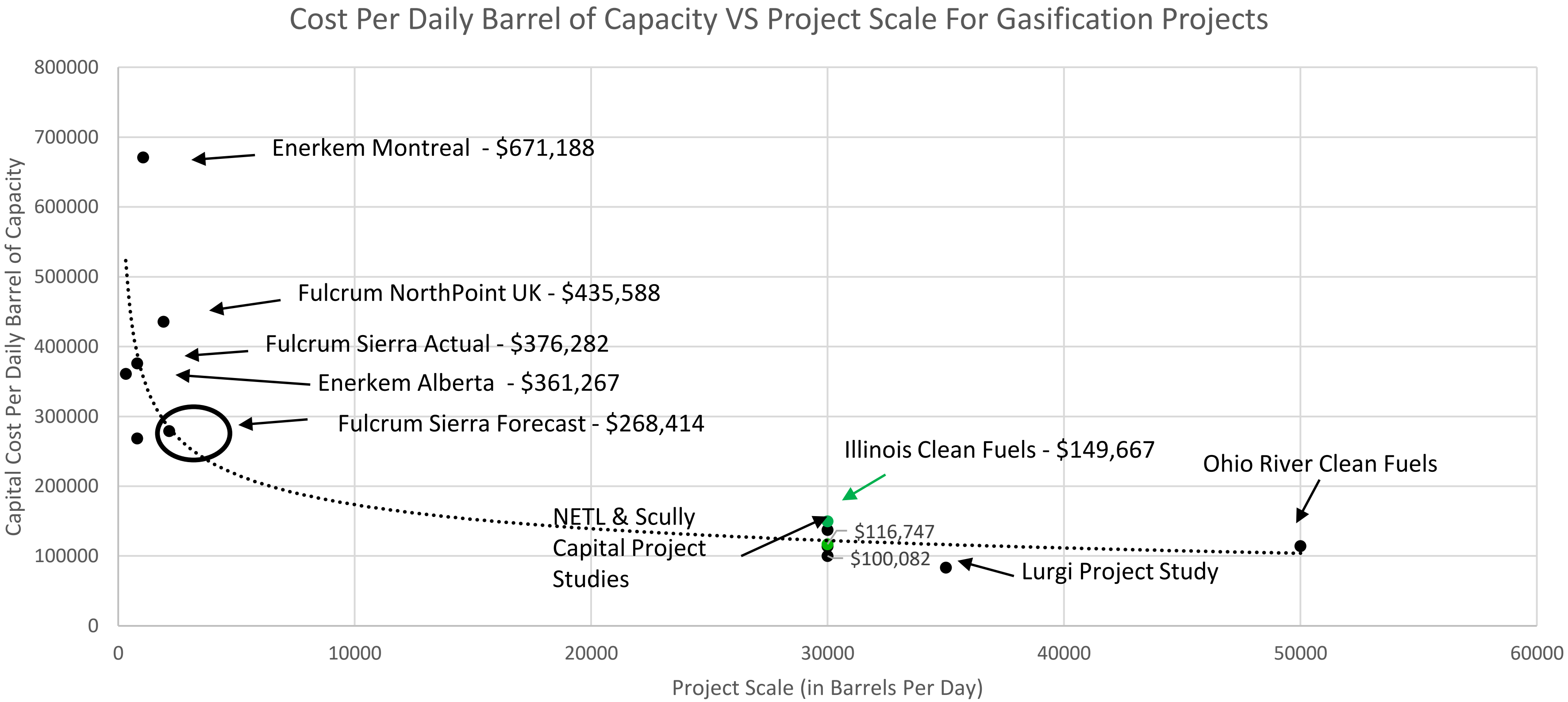
Big for a reason: Synfuel plants do not scale down gracefully!

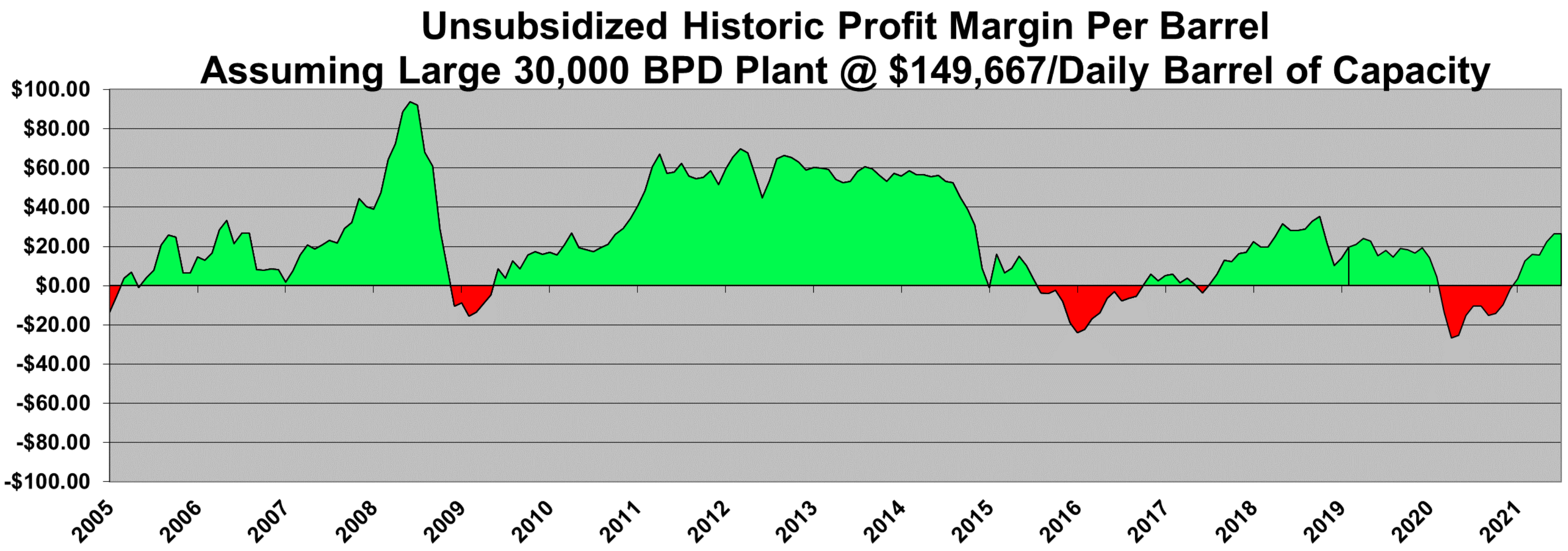


Cost per daily barrel (all-in)	Debt Service Costs/BBL (diesel)
$300,000	$111.12
$266,667	$98.78
$233,333	$86.43
$216,667	$80.26
$200,000	$74.08
$183,333	$67.91
$166,667	$61.73
$149,667	$55.44
$133,333	$49.39
$116,747	$43.24

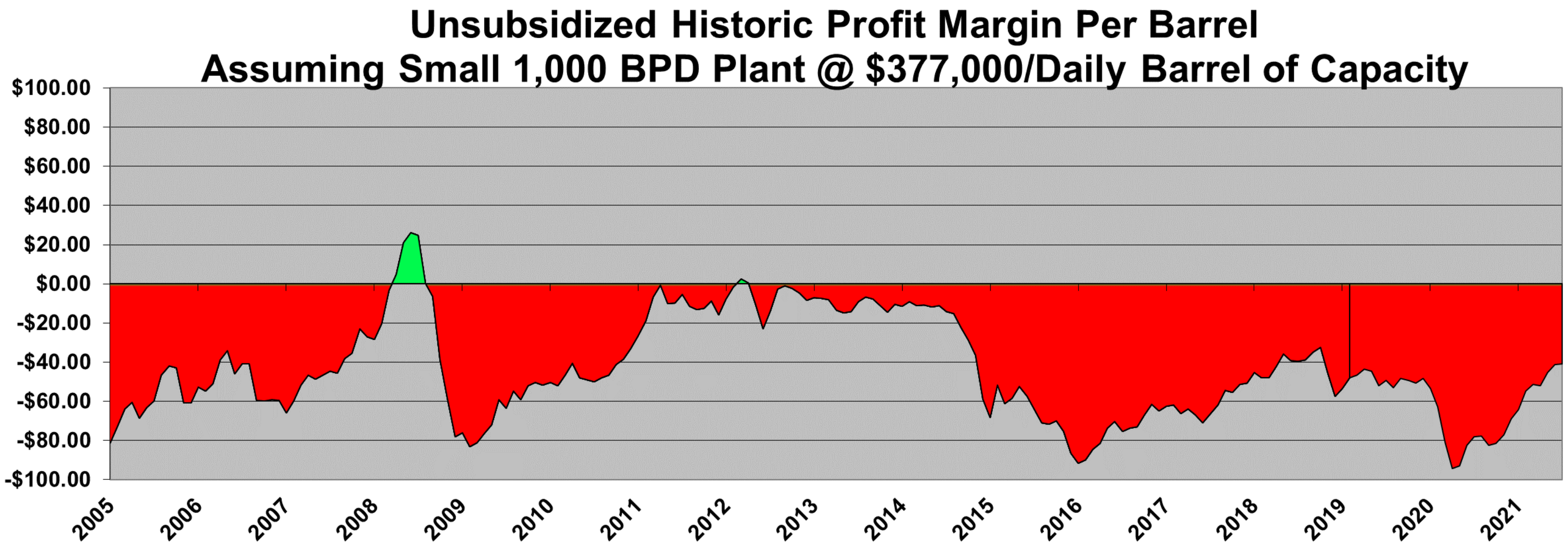
Capital costs are by far the largest contributor to the cost of producing a barrel of synthetic fuel.

An attempt to build a small plant more than doubles the contribution of capital costs to the overall production cost per barrel (reflected as debt service in the previous slide).

Why Scale Matters: Unsubsidized profit margins for 1000 BPD vs 30,000 BPD



Small scale plants are existentially dependent upon carbon pricing, subsidies, or both.



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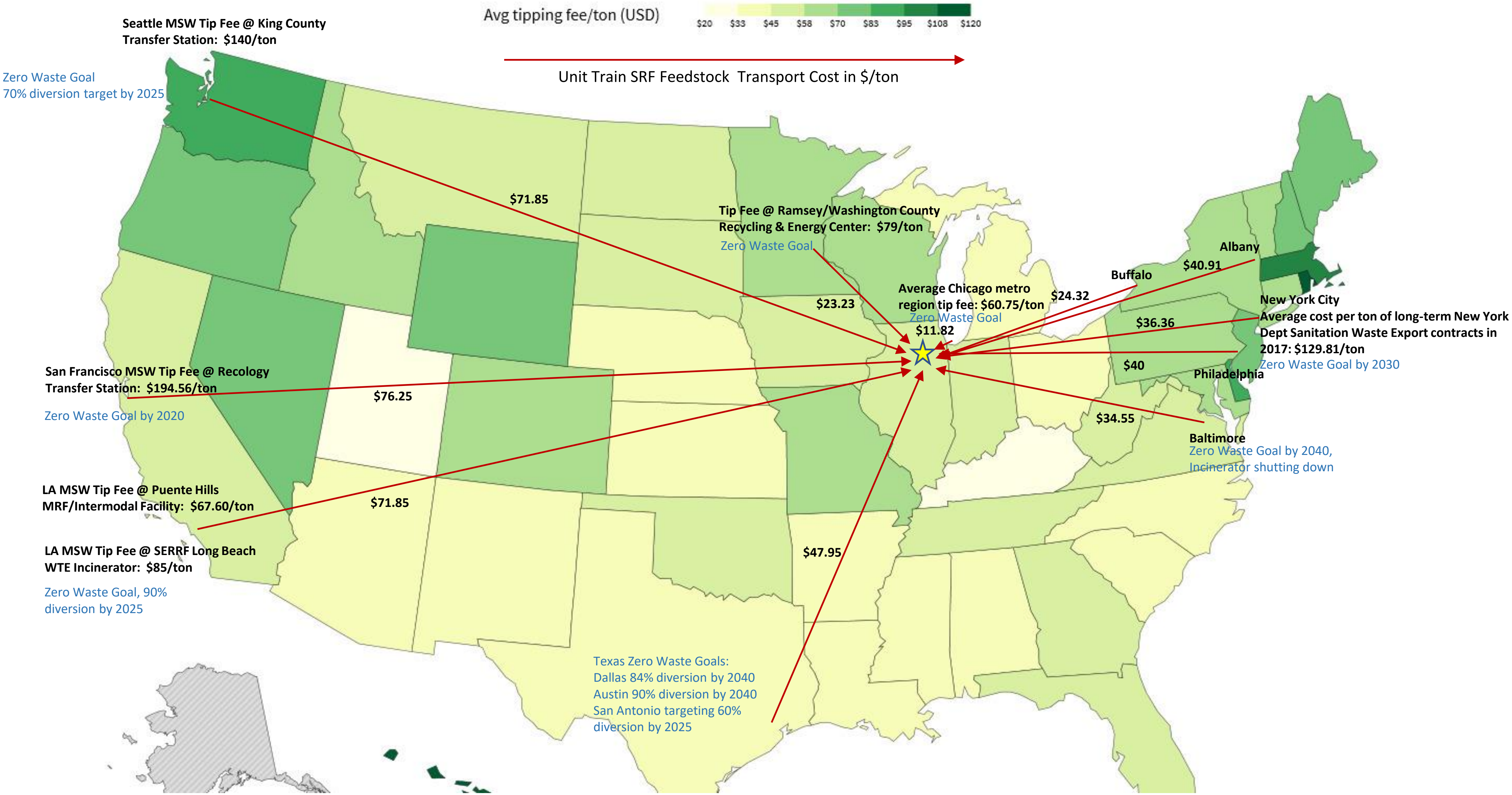
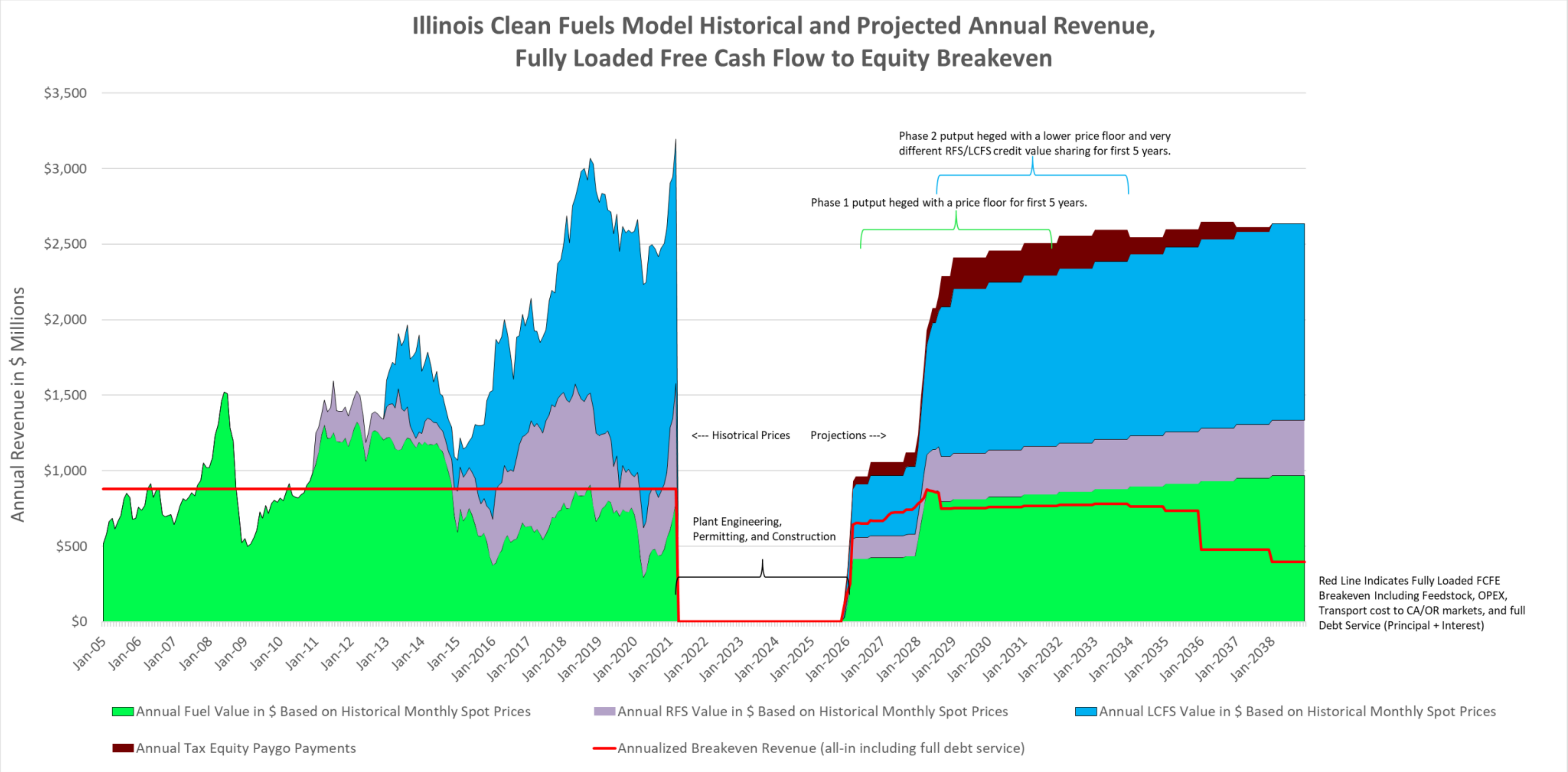
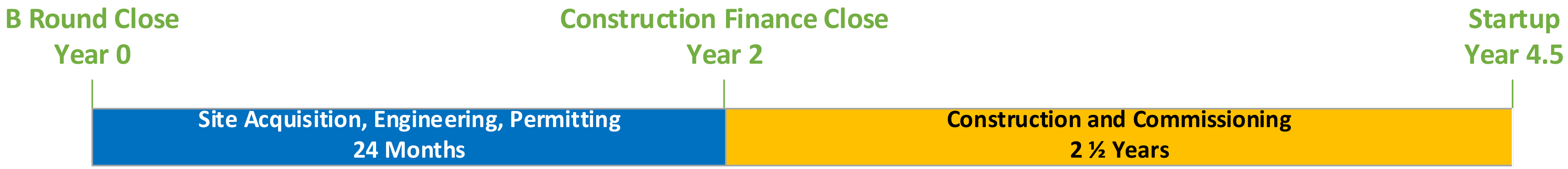
Logistics Costs & State Average Tip Fees



Environmental Products are worth more than fuel, and provide extra revenue during lean oil prices.



Project Development Timeline To First Production:
4.5 Years to Phase 1 Completion (First 15,000 BPD)



The project is executed in three main steps:

Design (backed by the angel round)

Development (Funded by our B round), which includes site acquisition, engineering, and permitting, and will take 2 years.

Construction, Construction finance closes upon completion of the final development tasks, and construction and commissioning will take approximately 2 ½ years.

We anticipate a liquidity event shortly after project startup either by going public into a yieldco structure, or through an acquisition by a strategic or large private equity group.

Our timeline, what's next

Development Phase (~24 months) *~$120 million, funded through an all-equity B round*, required to take the project to a fully permitted and "shovel ready" state – beginning with site acquisition, geological surveys, FEL2 project planning engineering

Construction Phase (Phase 1 ~30 months & Phase 2 ~24 months)

Liquidity is expected to be provided through an IPO or sale after completion of Phase 1 Construction

Amounts in $B	Phase 1	Phase 2	Total
Equity	0.9		**0.9**
Upfront tax equity	0.5	0.6	**1.1**
Debt	1.8	0.6	**2.4**
Total	3.2	1.2	**4.4**

Uses of B Round Funds in Development Phase

Site Acquisition

- Finalizing site acquisition and continuing to acquire pore space required for carbon storage

FEL 2 Engineering: Planning

- Finalizing Process Design with strategic partners/vendors
- Refining permitting related details including Emissions Quantities
- Finalizing process design selections, including
  - Optimizing size decisions of key equipment and transportation/trains
  - By-product handling and water treatment
  - Preliminary Equipment Layout & Rendering
- Refining project CAPEX and OPEX estimates

Permitting

- Utilize FEL 2 emissions values to draft required permit application and engage in active stakeholder public outreach and communications

Carbon Storage Site Development

- Gather 2D seismic data
- Select site to drill characterization well
- Secure options for storage site acquisition and pore space rights
- Drill characterization well, and obtain and analyze core, log data, and fluid samples.
- Develop geological model
- Design injection well layout
- Design CO_2 pipeline and option/acquire rights of way
- Develop Monitoring, Verification, and Accounting Plan
- Develop, file, and support UIC class VI CO_2 injection and storage license application
- Undertake Area of Review corrective action, if any

FEL 3 Engineering: Project Definition

- Refined Mass & Energy Balances
- Finalized Utility Flow Diagrams
- Detailed Piping & Instrumentation Diagrams
- Equipment specifications & Lists
- Preliminary instrument specifications and lists
- Basic electrical line drawings
- Pre-design hazop analysis
- Layouts & site plans
- Final Cost estimate ~+-10%
- Project Execution Plan
- Detailed EPC Project Schedule
- Commissioning and Startup Plans

Feedstock Supply Chain Development

- Develop feedstock supply option agreements to source the required feedstock volumes in time for project startup
- If necessary to accelerate development of these, capitalize a subsidiary company to develop and permit MRFs

Would you like to learn more?

Join us in the breakout session!

Room Lawrence A

Or send me an e-mail at stephen@icfuels.com