

# **RNG Status Update: Flash in the Pan, Flatlined or Fabulous Future?**

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Presented by: Brian Petermann, PE

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# **Review & Deeper Dive of Science and Drivers**

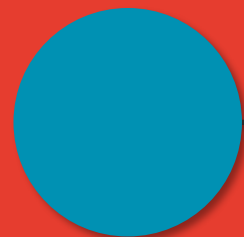
# It's All About Reducing CO<sub>2</sub>e Emissions



**Methane**  
1 pound



**Fugitive Methane**  
CO<sub>2</sub>e = 25 pounds

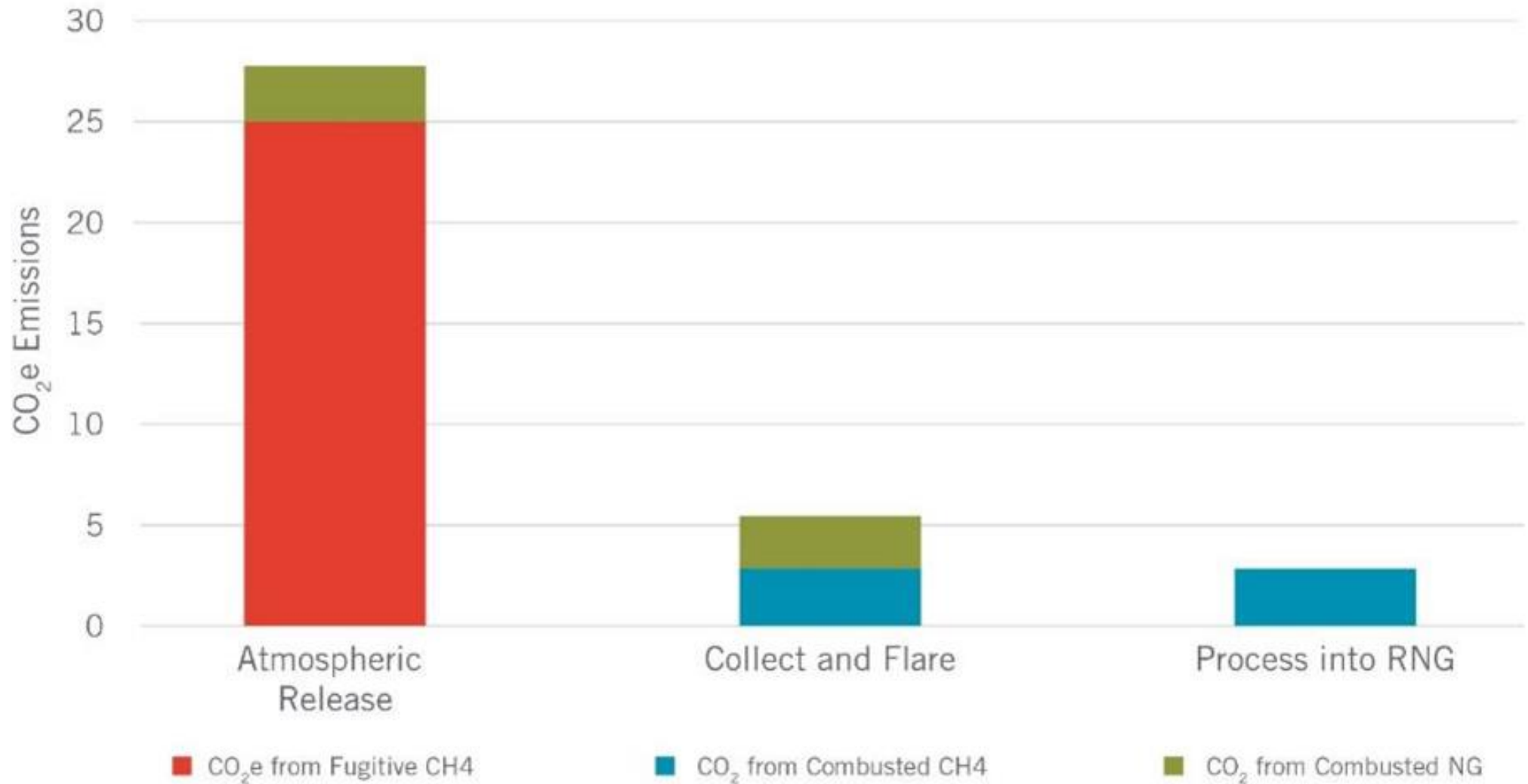


**Combusted Methane**  
CO<sub>2</sub>e = 2.75 pounds

# Renewable Natural Gas

Any pipeline-compatible gaseous fuel derived from biogenic or other renewable sources that has lower lifecycle CO<sub>2</sub>e than geological natural gas.

# Driver 1: Science - RNG Reduces CO<sub>2</sub>e by 90%



## **Driver 2: Profit**



### **Federal RFS:**

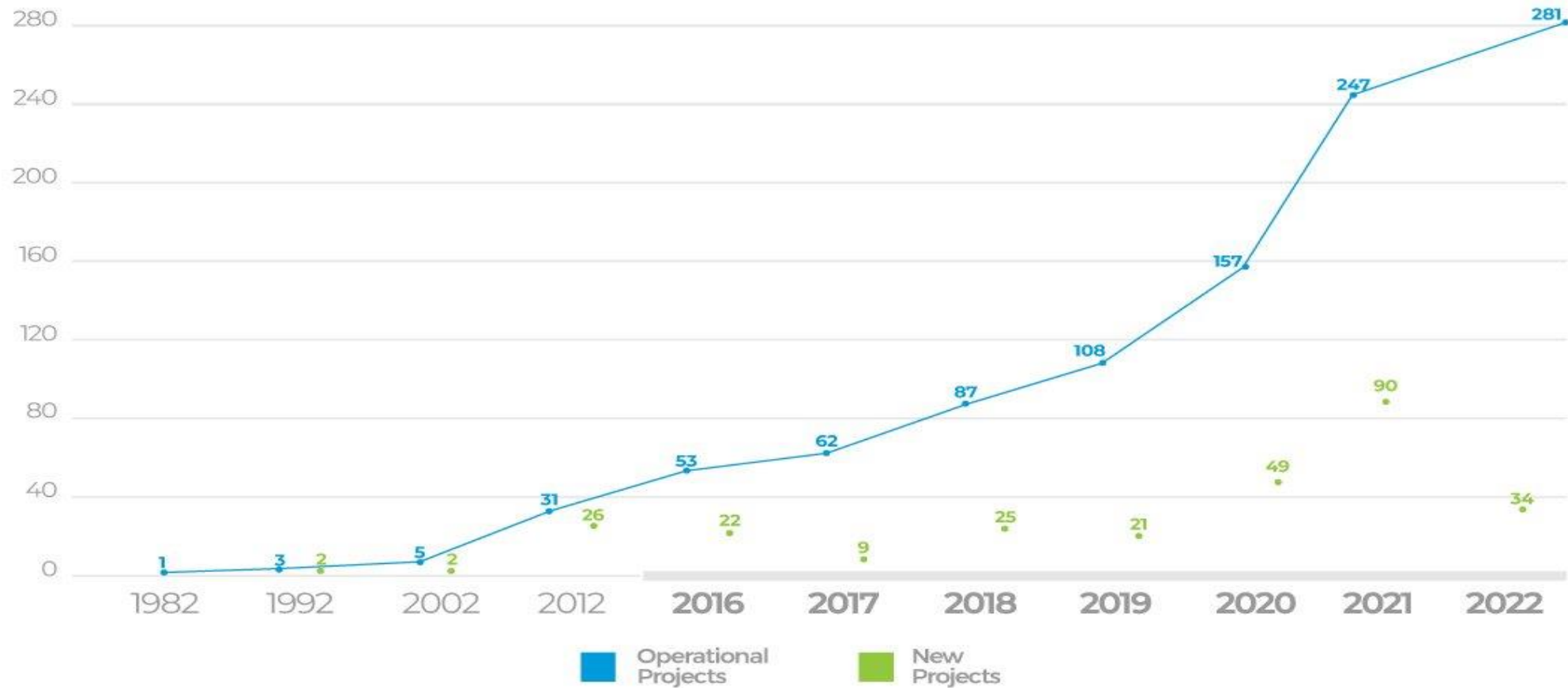
- **RIN: renewable identification number**
- **Worth money**
- **RNG included when used as transportation fuel**
- **LNG or CNG**

### **State-Based Marketplace:**

- **Low Carbon Fuel Standard (LCFS)**
- **RNG price based on its Carbon-Intensity (CI) score**

# **Status and Trends**

# RNG Facilities are Growing in North America







**US Natural Gas:  
30 million MMCF Is**

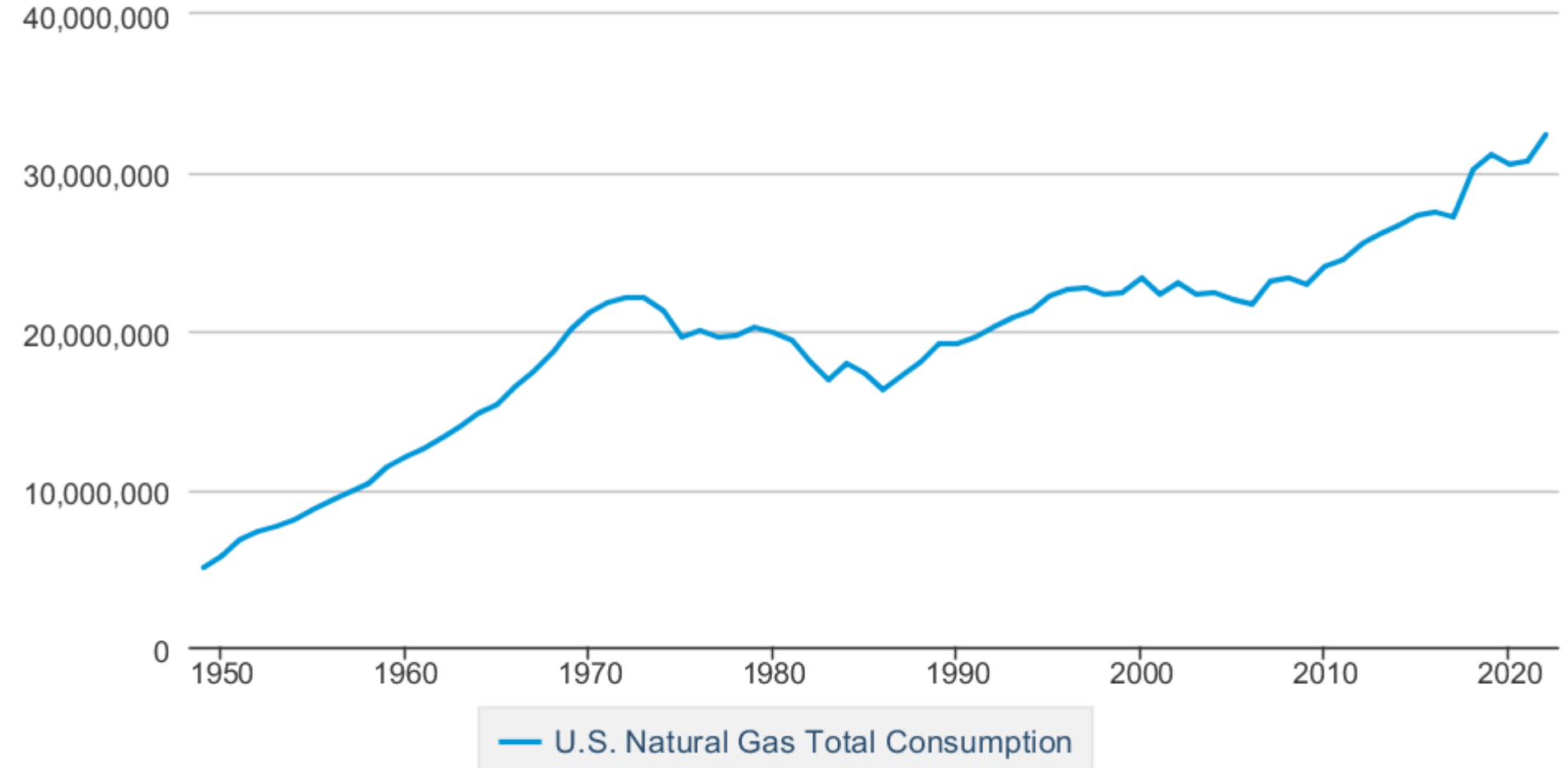
**30,000 bcf**

**US RNG:  
87 bcf (2021)**

**0.29 percent**

## U.S. Natural Gas Total Consumption

Million Cubic Feet



Data source: U.S. Energy Information Administration

# RNG Global Production Growth

IEA Net Zero by 2050 Scenario



By **2030**,  
RNG production  
will be  
**7x** 2020 levels.



By **2050**  
RNG production  
will be  
**27x** 2020 levels.

# Economic Drivers Increasing



Project Assai

- Renewable Fuel Standard (RFS)
  - Requires renewables volume in the form of RINs
  - Increases by Year
  - 7/12/23 Fed Reg issued amounts for 2023-2025.
  - Will be adding eRINs
  - eRINs when used for electric production
  - Could be a game-changer

# Economic Drivers Increasing (continued)



Landfill Gas to RNG Facility, Michigan

- Low Carbon Fuel Standards
- Current
  - CA
  - OR
  - WA
- Proposed
  - IL
  - NY
  - MA
  - MN
  - NM
  - VT



# RNG Volume by Feedstock



Food Waste/SSO

6%



Wastewater

5%



Ag Waste

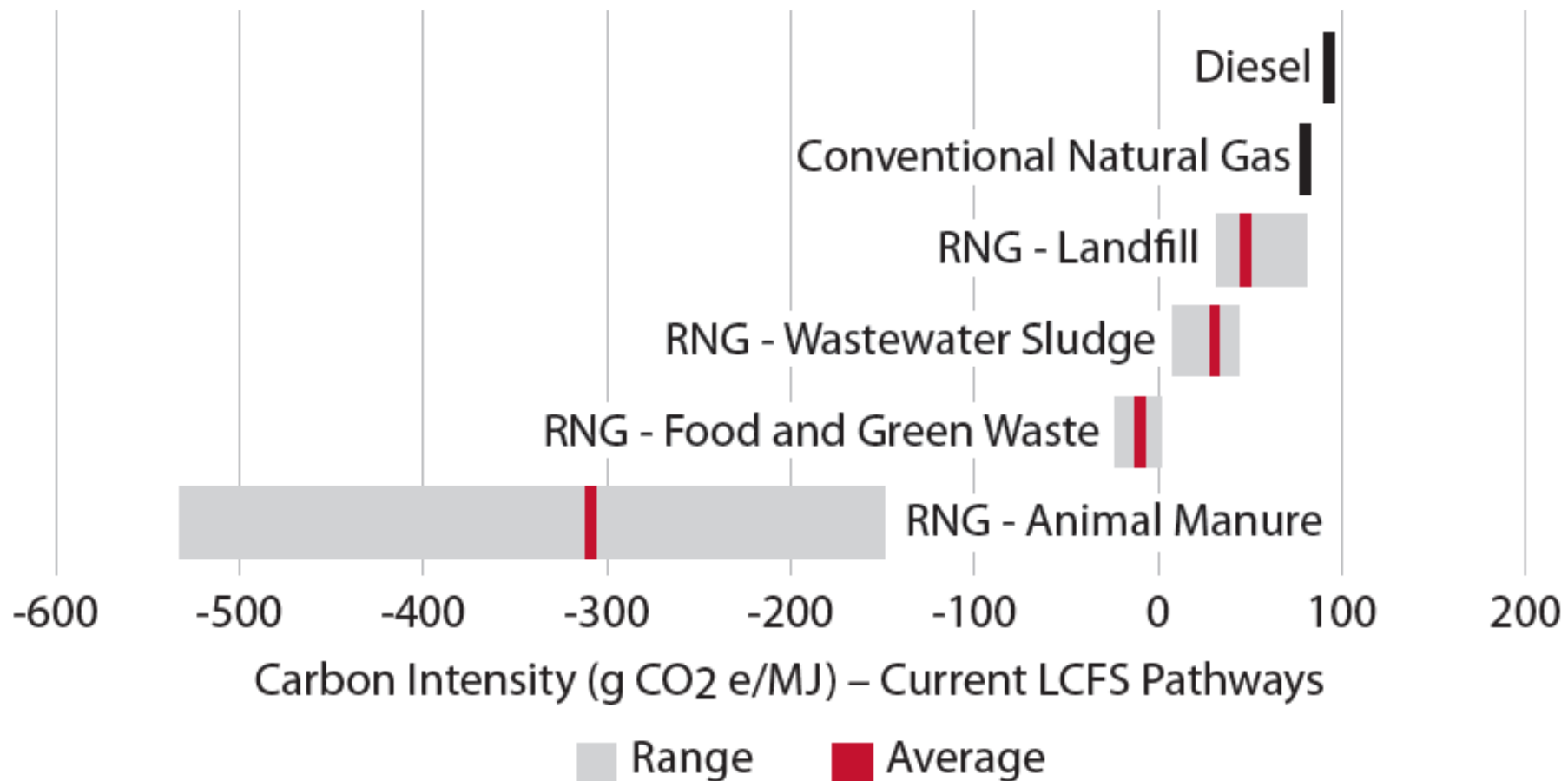
17%



MSW

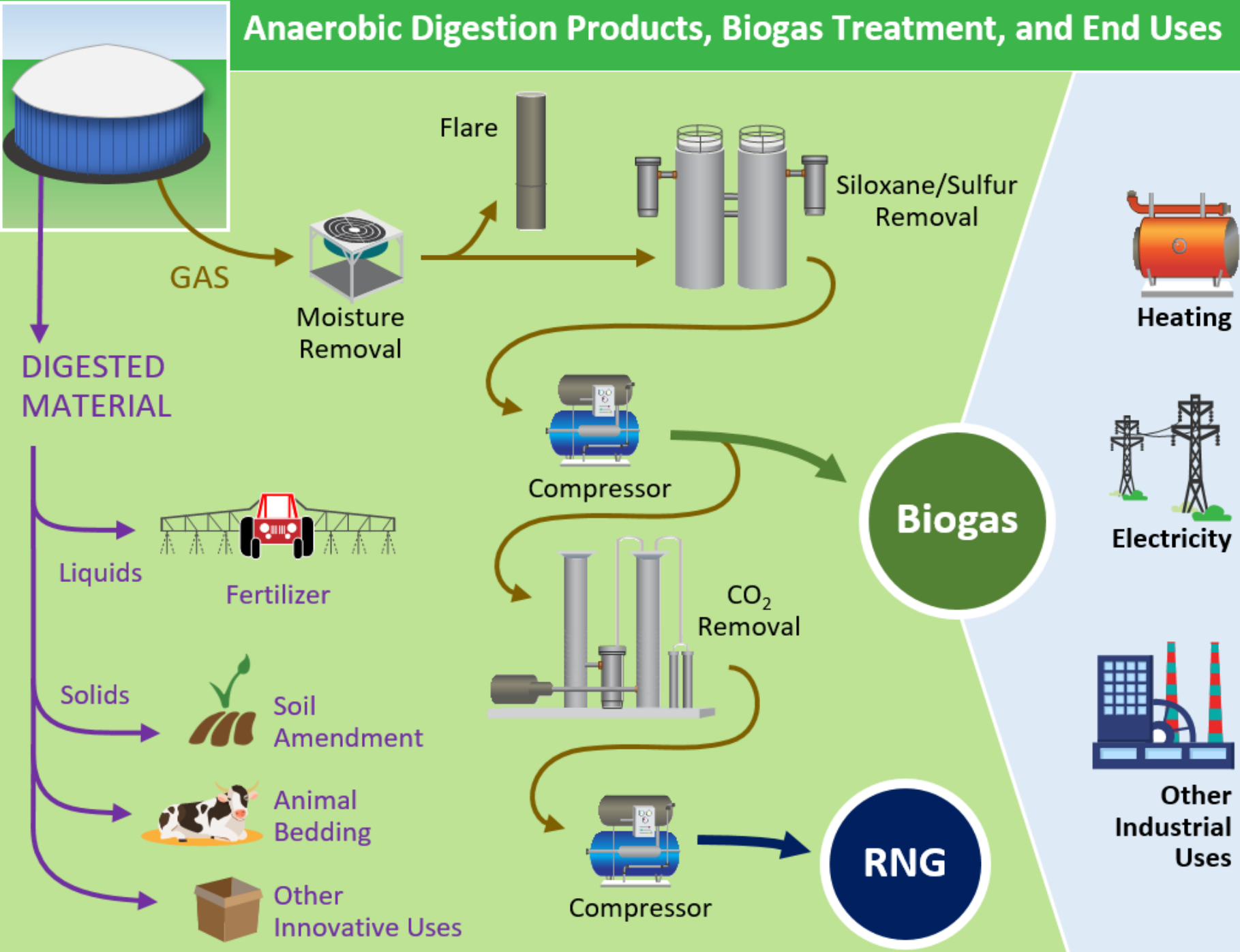
72%

## Renewable Natural Gas's Carbon Intensity Is Five Times Lower Than Conventional Natural Gas



Source: World Resources Institute, Renewable Natural Gas as a Climate Strategy; Guidance for State Policymakers

# Anaerobic Digestion Products, Biogas Treatment, and End Uses



Source: USEPA



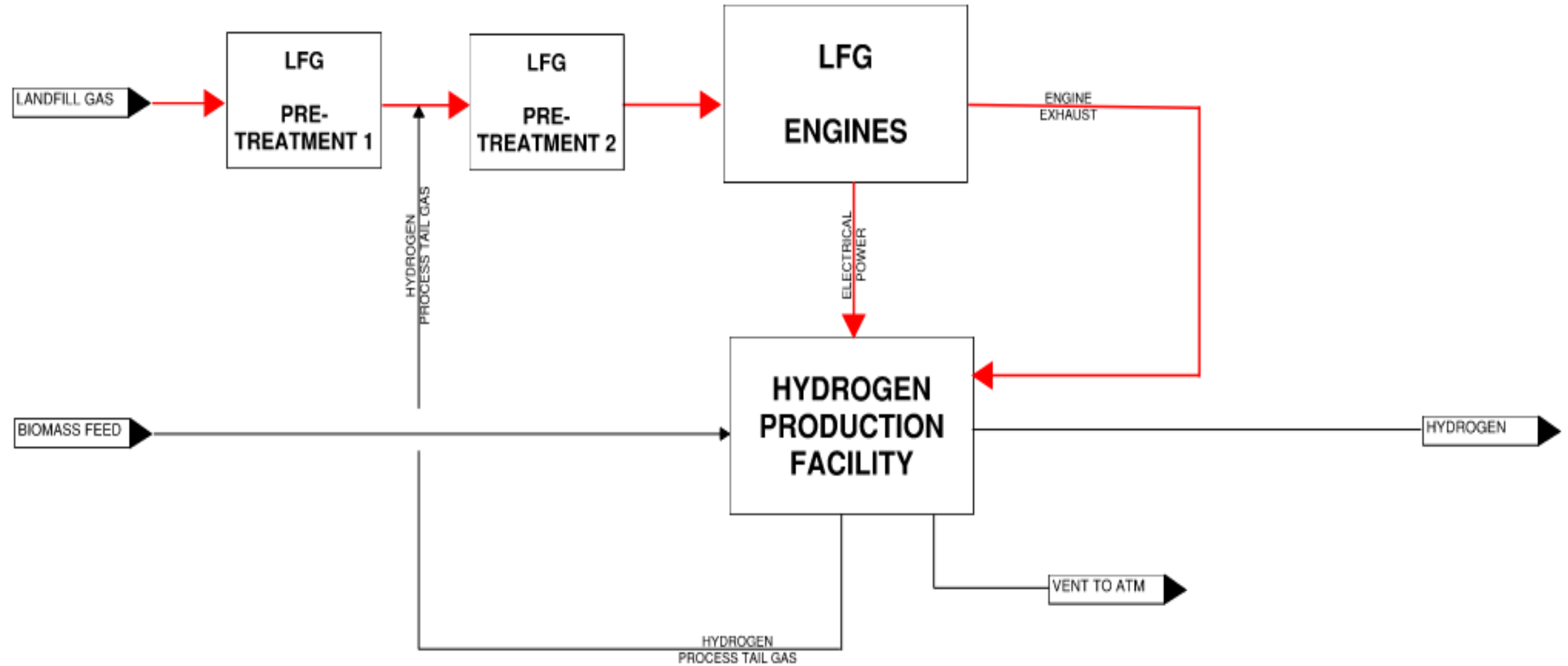
# RNG Design:

## Landfill Gas (LFG) for Power to Operate a Biomass Hydrogen Plant

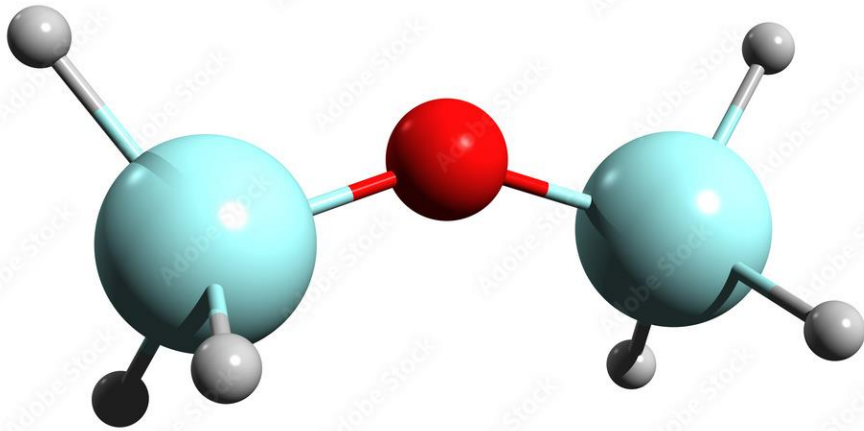


**Howard Skidmore, P.E.**  
Chemical Technology Solutions  
Principal Engineer Area Lead

# PROCESS BLOCK DIAGRAM



# PRETREATMENT NEEDS (Basically making RNG)



- KO Drum
- Sulfur Removal
- Moisture Reduction
- Siloxane & Halogen Removal
- Carbon Polishing
- Particulate Filter



**“Difficulties mastered are opportunities won.”**

*–Winston Churchill*  
*March 21, 1943*



*Photo credit: Moritz Mentges on Unsplash*

# Thank you



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