Amp Americas

CBA Symposium | November 9, 2022

Manure Digestion to Low Carbon Fuel

Amp Vision, Mission and Values Guide Our Actions

VISION	To accelerate the global transition to 100% renewable fuels by harvesting energy from waste materials
MISSION	Build, own, operate, and profit from the premier portfolio of assets producing 100% renewable, ultra low and negative carbon fuels and feedstocks using waste at farms, industrial facilities, and municipal waste facilities
VALUES	We create true sustaining economic and environmental impact for our people, our partners, our families, our communities, our planet, and our investors. We act with integrity in accordance with our core values: safety, trusting relationships, excellence, entrepreneurship, and personal responsibility

Leader in U.S. Dairy Renewable Natural Gas

At Our Farms

In CA & Other States

We eliminate methane emissions

- **Reduce GHG emissions from agriculture**
  - Methane is more than 25x as potent as CO_2 in trapping heat in the atmosphere(1)
- **Basis for negative Carbon Intensity ("CI") and premium pricing of Dairy RNG**

We build long-term infrastructure assets

- **Build, own, operate business model**
- **20+ years life assets**
- **Long-term feedstock contracts to manure**

We inject gas into the natural gas network

- **Utilize existing pipeline infrastructure**
- **Gas alternatively used for electric generation**

We sell carbon negative fuel and carbon credits

- **Reduce transportation sector emissions**
- **Deliver carbon negative CNG to trucks in California**
- **Generate D3 RIN and LCFS credits**
- **Sell credits to refiners and fuel marketers**
- **Collect & report data to track GHG impacts**

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Source:
1. EPA: https://www.epa.gov/gmi/importance-methane.

What is Evaluated for a Low Carbon Fuel

Calculating the LIFECYCLE EMISSIONS

Well-to-Wheel (CARB) or Well-to-Gate (IRA)

Baseline & Project

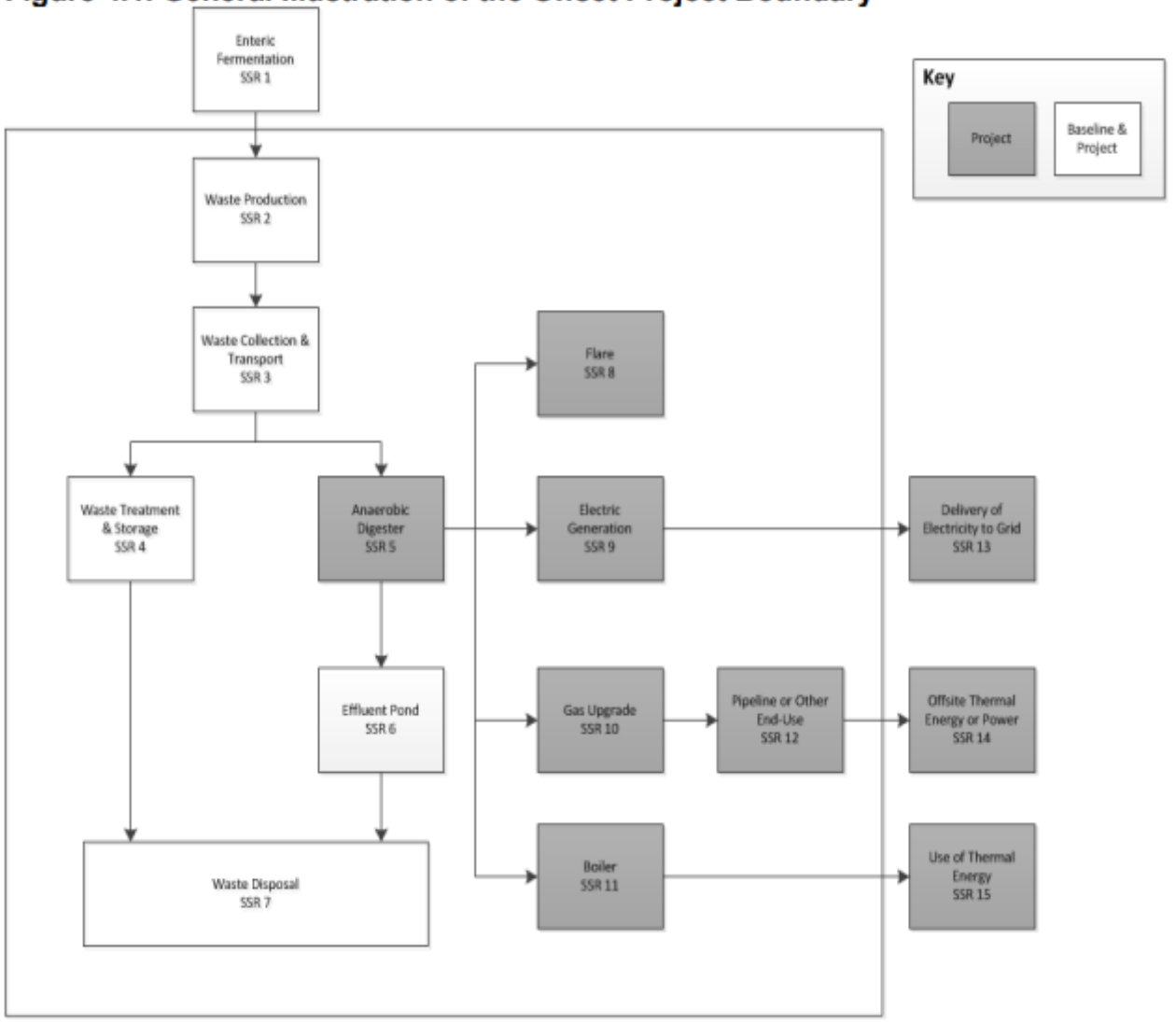
- Waste Production
- Waste Collection & Transportation
- Waste Storage & Treatment, and Waste Disposal
- Avoided CO_2 Diverted from Land Application

Project

- Raw Biogas Production/Anaerobic Digester
- Onsite Combustion (Boiler/Flaring)
- Biogas Upgrading to Pipeline End Use
- Electricity Generation to Grid
- Biomethane Transmission, Compression, and Tailpipe Emissions

These are used to calculate total **CARBON INTENSITY** (CI) of a fuel (e.g. gCO_2e/MJ)

Figure 4.1. General Illustration of the Offset Project Boundary



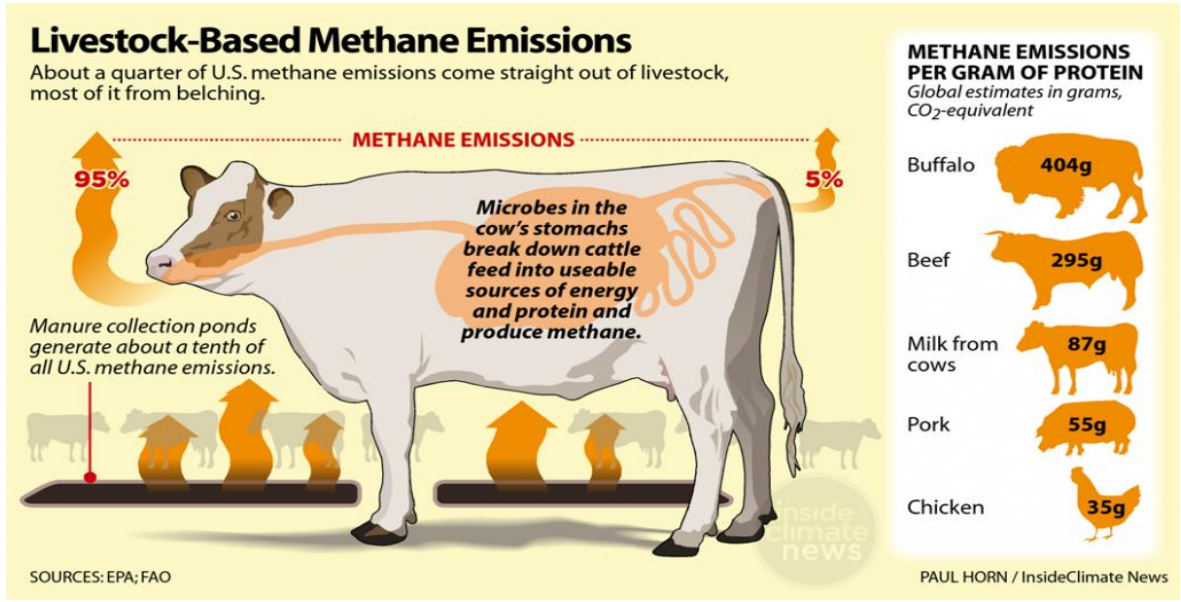
Baseline Emissions & Avoided Methane

"Baseline Emissions" means the greenhouse gas (GHG) emissions within the Project Boundary that would have occurred if not for the installation of the biogas collection system (BCS). Normal baseline conditions would include:

- Lagoons
- Solids used for Beneficial Use (Bedding/Compost/Field applied)
- Dry lot

Emissions are calculated using:

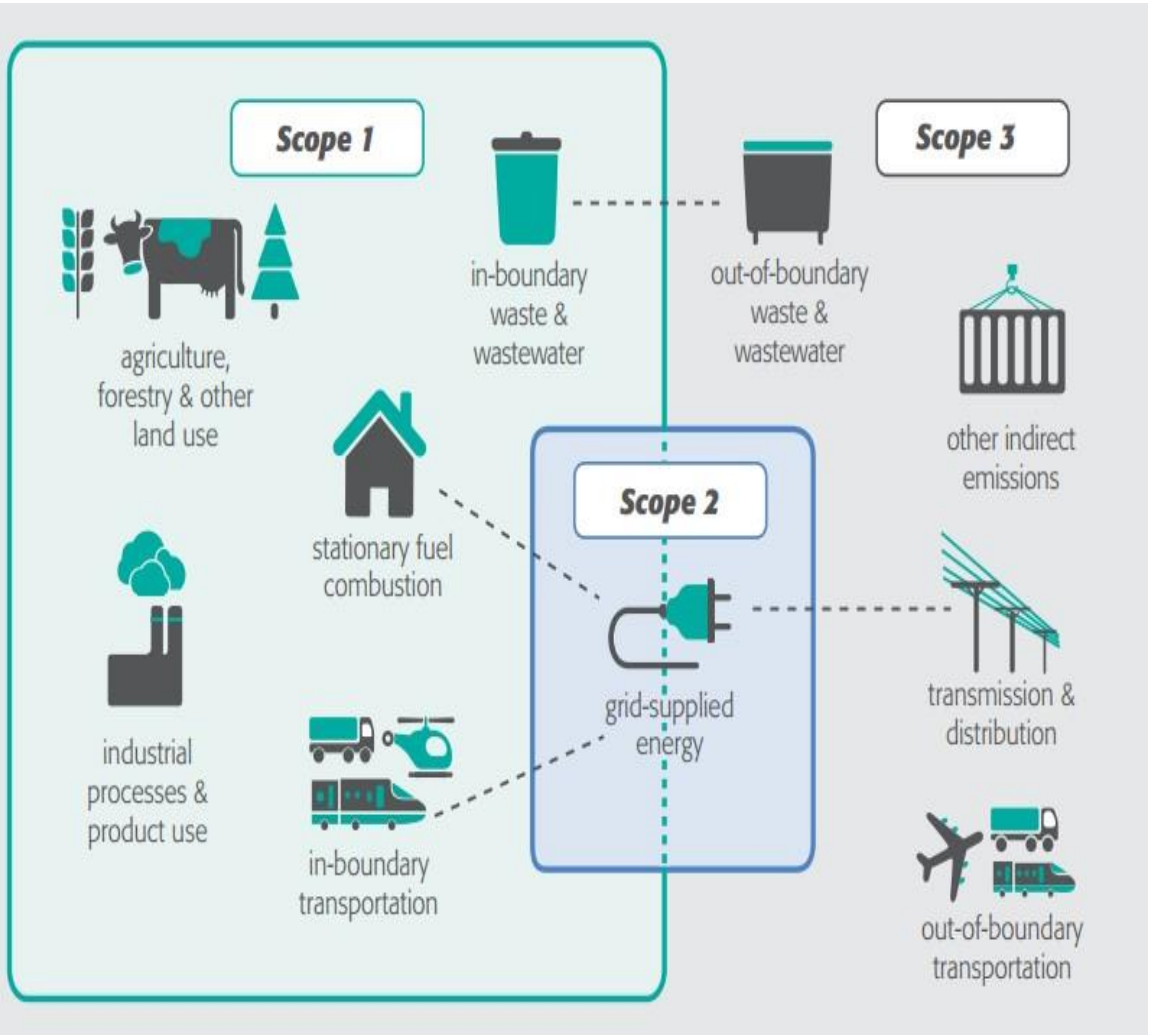
- CARB Compliance Offset Protocol LOP
- ANL GREET Model
- CARB Tier 1 Simplified CI Calculator for Biomethane from Anaerobic Digestion of Dairy and Swine Manure



Project Emissions

Project Emissions will vary based on the boundary set, example are:

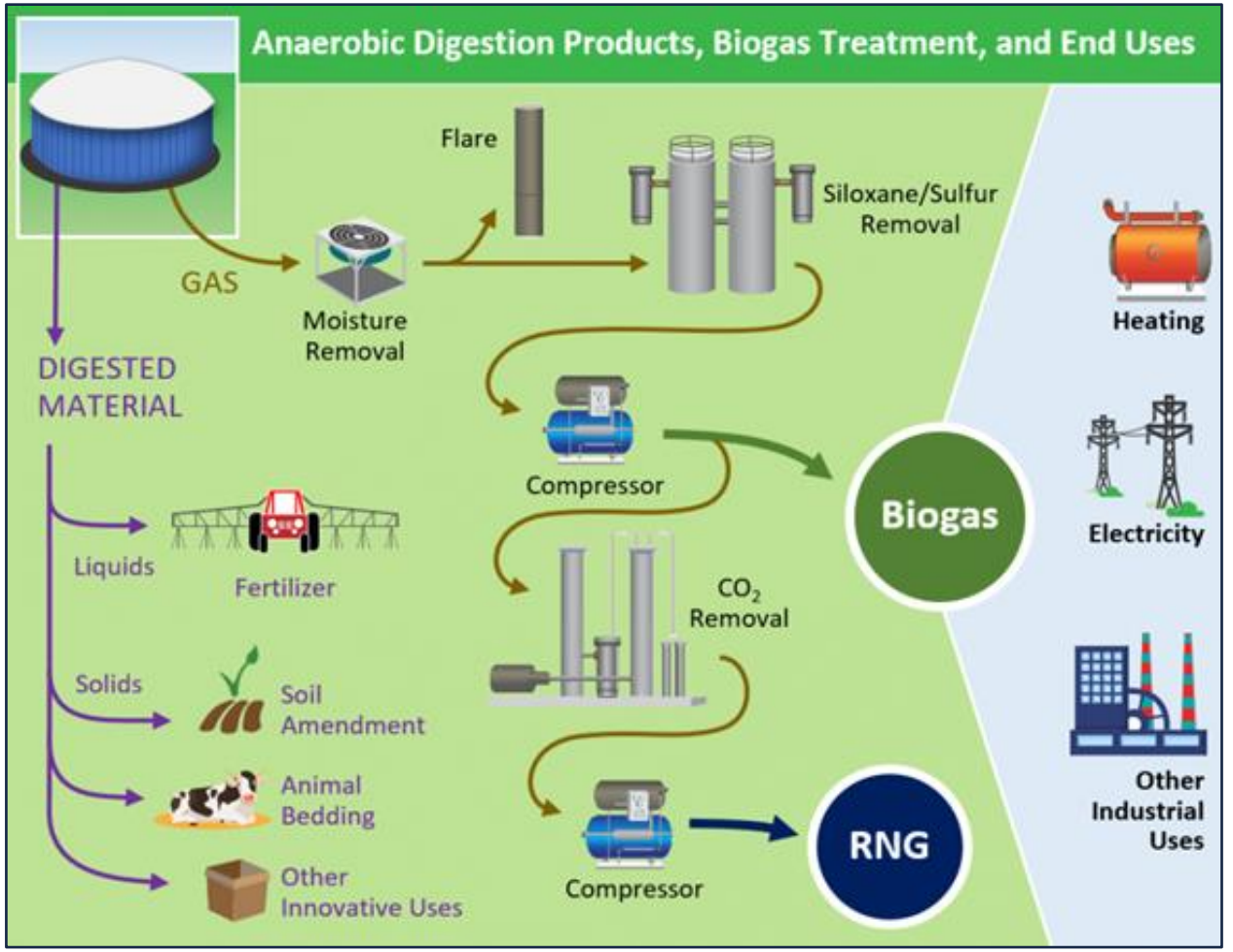
- Fossil Fuels
  - Stationary combustion – Natural gas to heat the boiler
  - GRID electricity – electricity to operate gas upgrading plant and compressors to move RNG
- Fugitive emissions
  - Venting methane
  - Effluent pond methane
  - Storage treatment methane
  - Digester leakage
  - Feed loss
- Allocation of methane (CH_4) for project use (e.g., transportations use, carbon offsets, etc.)



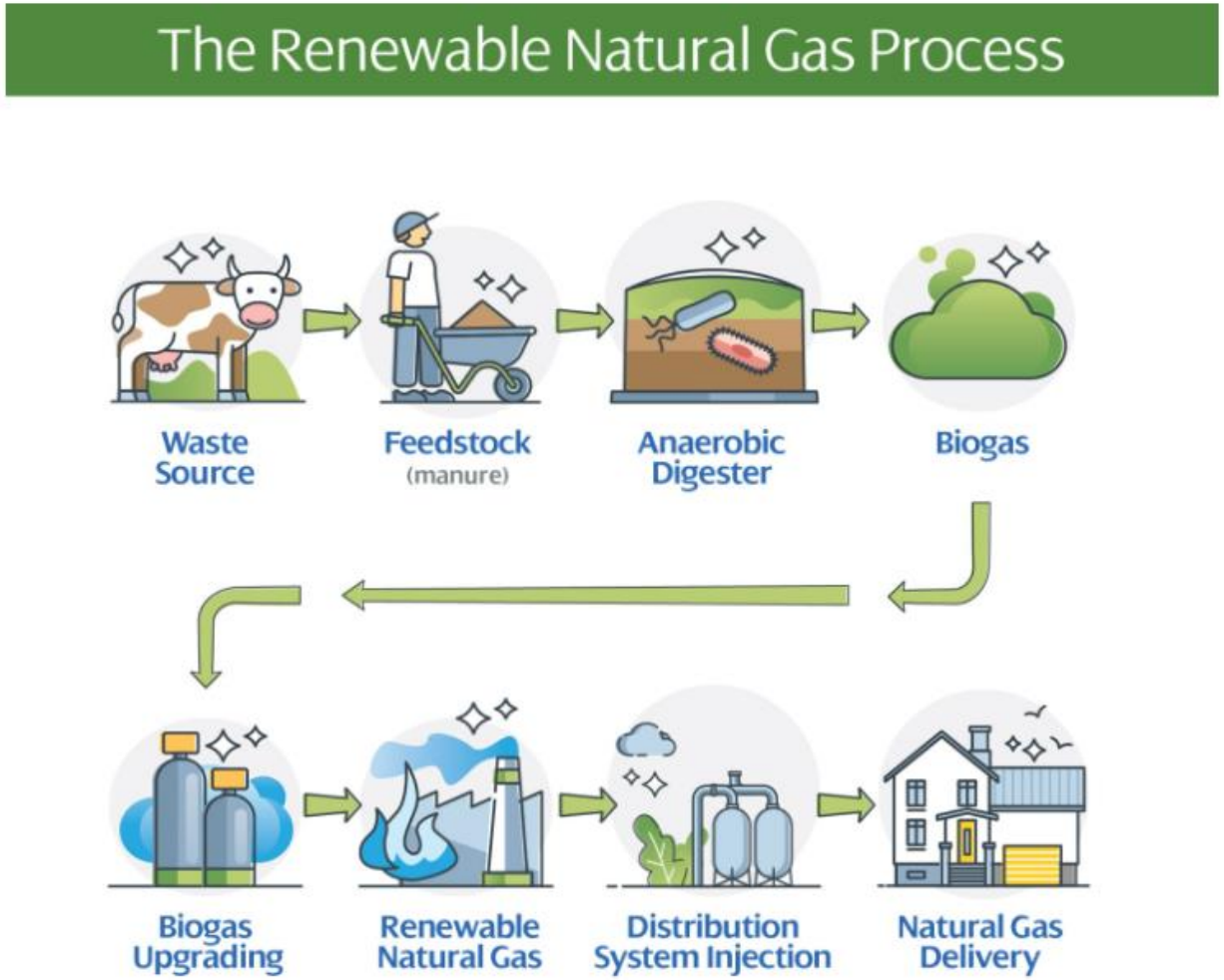
Biogas Collection

In this instance, the feedstock, dairy manure, is collected and routed to a digester (for approximately 20 days) to collect the methane that would have been vented to the atmosphere in the baseline, creating avoided emissions/carbon negative fuel base.

Once the manure passes through the digester, it is returned to the farmer for beneficial end use (i.e. bedding, farm applied/replacing fertilizer).



Overall RNG Production Process



Once the biogas is collected, there are multiple opportunities on how it can be used, which include:

- Upgrading to RNG
- Used onsite to replace natural gas use (e.g., boiler)
- Sent to a fuel cell or internal combustion engine
- Destroy it in a flare

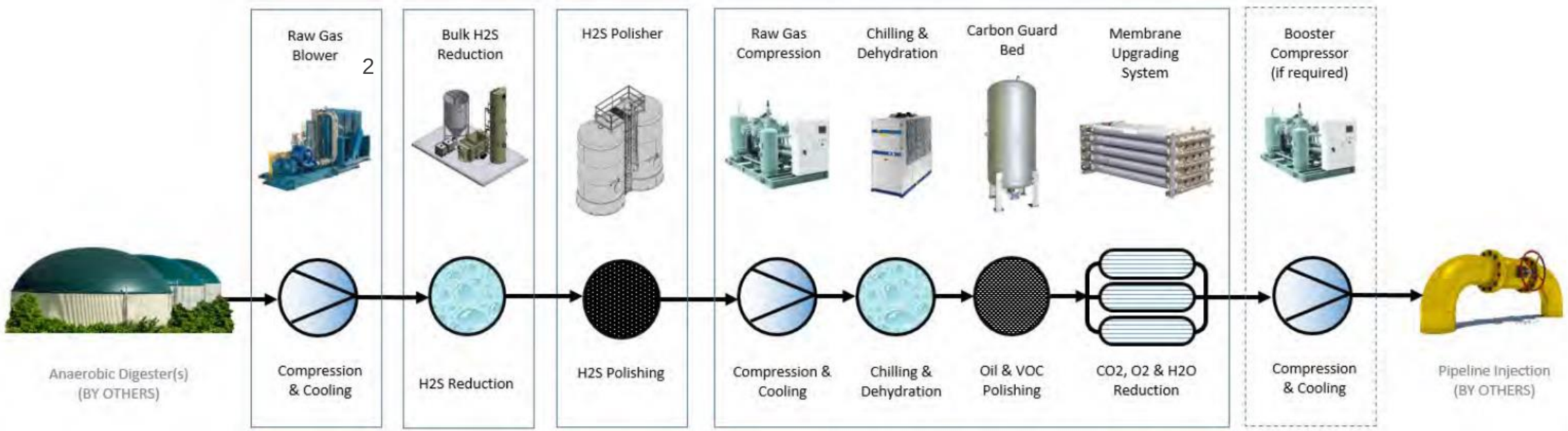
The most beneficial use is to replace a fossil fuel with the use of RNG.

Turning Avoided Emissions to a Low Carbon Fuel

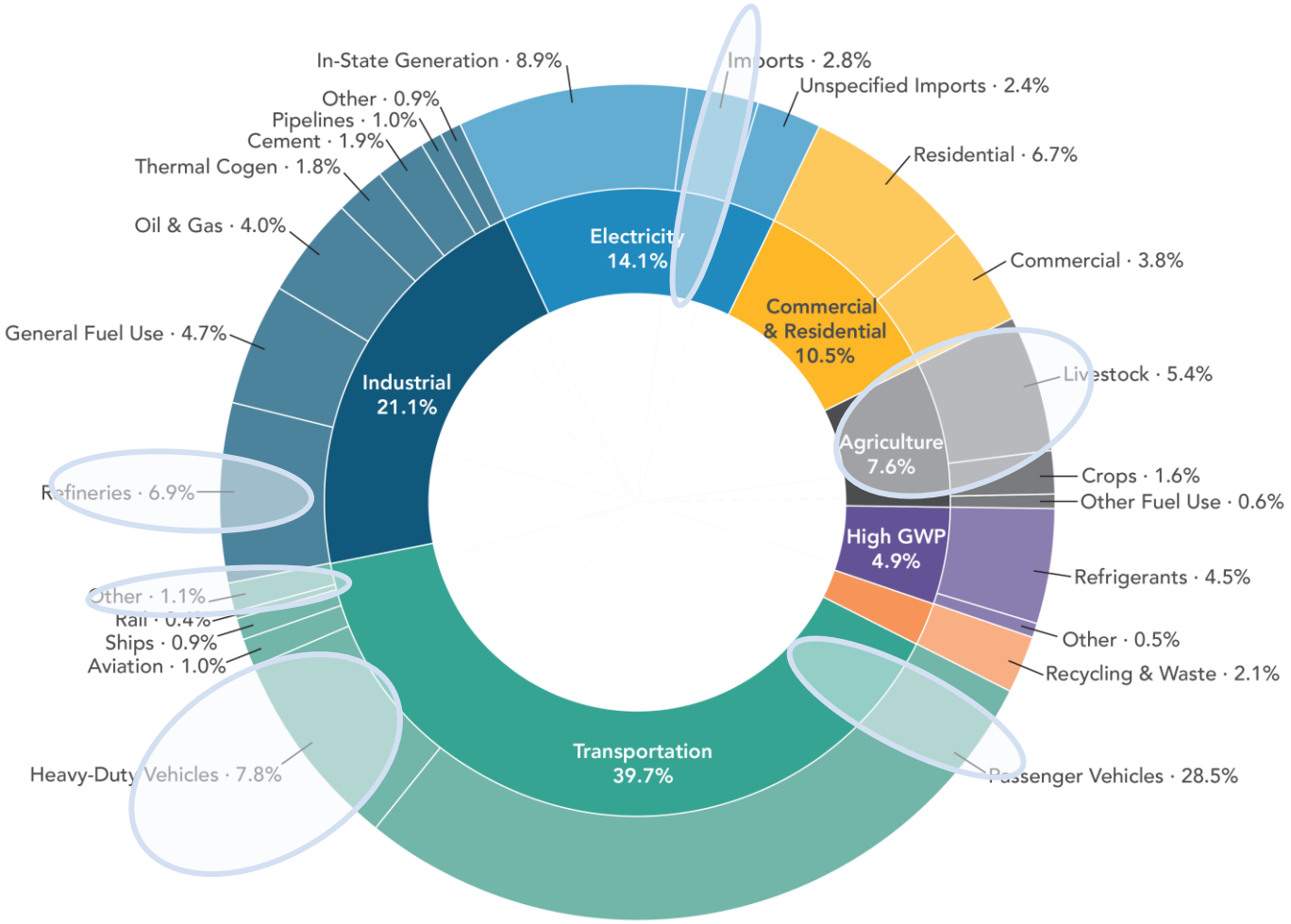
Dairy digester biomethane typically ranges between 52% and 62% methane. Once the biogas is collected it goes through the following upgrading process:

- Gas blowers
- Hydrogen sulfide (H_2S) removal
- Compression
- Carbon dioxide (CO_2) removal

RESULT: ~98% Methane Renewable Natural Gas



RNG Uses



Circles show sectors where Amp projects are reducing GHG emissions with low carbon fuels.

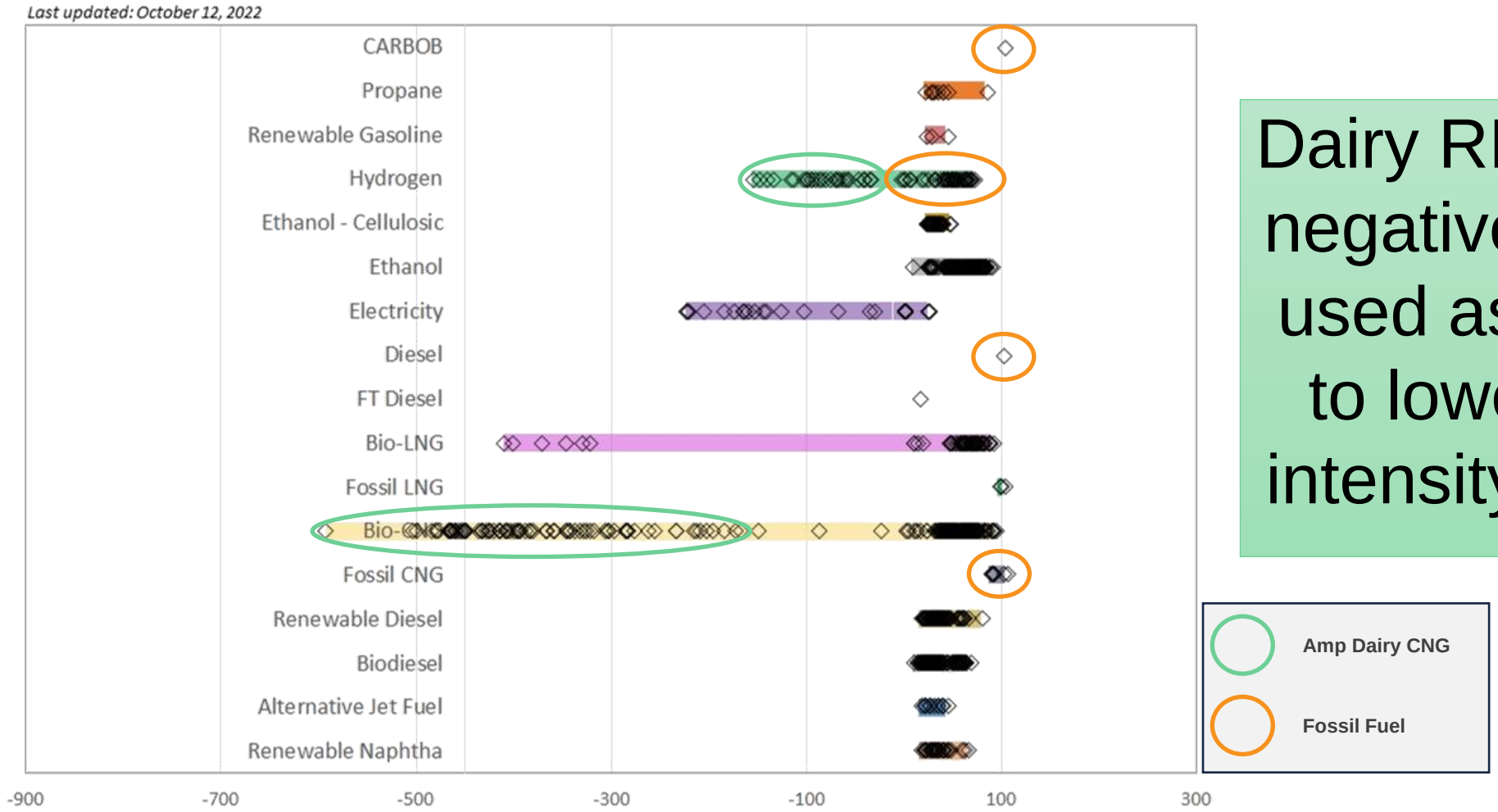
Once upgraded to RNG or electricity, you have a low carbon fuel that may be used in multiple avenues. These may include:

- Transportation Use (RFS & LCFS programs)
- Green Hydrogen
- Low CI Electricity - Power Generation
- Industrial Use
- Residential Use

In addition, RNG can replace any fossil fuel natural gas source without needing to upgrade equipment.

Dairy RNG Low Carbon Fuel

Carbon Intensity Values of Certified Pathways
EER-Adjusted



Dairy RNG is a carbon negative fuel, that can used as itself of used to lower the carbon intensity of other fuels

Track Record of Innovation and Leadership in RNG

1st dairy RNG – to fuel project certified to **make RINs**

1st dairy RNG-to-fuel project **certified by CARB**

Lowest CI score awarded by CARB at the time (-255)

1st dairy RNG **M&A Transaction**

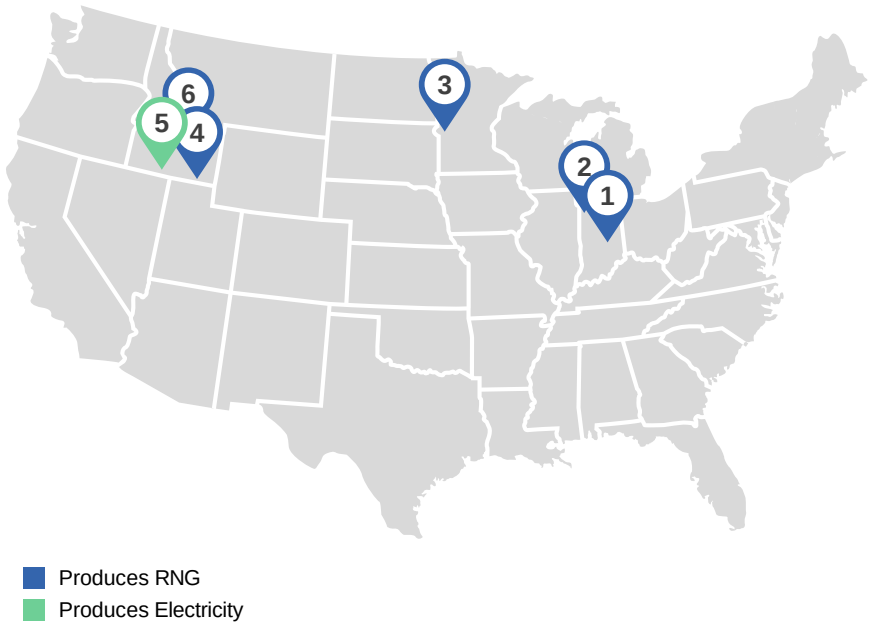
1st D3 **sale on Nodal** exchange

1st dairy **RNG to hydrogen** fuel **pathway**

Executed 2 dairy RNG **M&A transactions**

Initiated Lobbying efforts to **support dairy RNG** industry across the country

Current Portfolio of Assets



- Amp dispenses low carbon fuel into the California market and has a goal of developing a California project.

- The lessons we have learned over the past 10+ years provides us with a unique ability to build, own and operate a variety of dairy RNG projects (large & small herd sizes, concrete & steel digesters, RNG & electricity production)
- Relationships that we have established have been strengthened over time by our ability to 1) communicate transparently with our partners and 2) deliver on our promises time after time
- Alignment is essential and we seek out partners interested in long-term win-win relationships

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