Clean Energy and LACSD Expanded RNG Station in Carson

Alternative Technology Advisory Subcommittee (ATAS)

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Clean Energy

CE at a Glance

600+ stations throughout the U.S. and Canada

Blue chip customer base

amazon

ups

WASTE MANAGEMENT

Leading RNG player in the US

Partnerships with energy leaders

Chevron

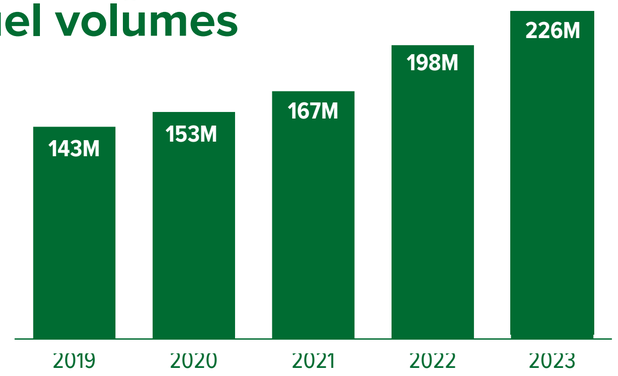
bp

TOURMALINE

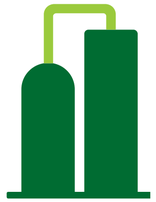
TotalEnergies

Environmental credit leader

Growing RNG fuel volumes

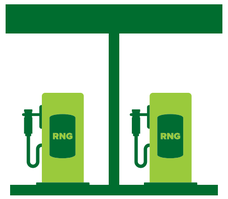


Who We Are



RNG Supply

- Dairy/RNG production
- 3rd party RNG supply contracts



Distribution

- 600+ stations (U.S. and Canada)
- Capacity to double volumes
- Fleet + marine customers
- Maintenance + construction
- 2 owned LNG plants

Clean Energy

- Vertically integrated RNG solutions
- 25+ years of experience
- Invented RNG as a commercial fuel

Operating information is as of November 30, 2023.

Project Overview

Goal:

Expand an existing retail facility into a state-of-the-art, fast-fill CNG station serving all vehicles including Class 8 trucks, increase throughput, and dispense RNG including but not limited to Joint Water Pollution Control Plant RNG.

Scope:

- Design and build a station with two fast-fill dual-hose dispensers integrated with two existing dispensers (8 hoses total) and modify the premises for efficient truck access.
- 10 Year O&M
- Supply of RNG (JWPCP & pipeline)
- Management of Environmental Attributes

Design Details

Station Performance:
The new system consists of two 250HP IMW compressors, gas dryer and nine ASME storage vessels with a nominal capacity of 11,500 SCF of storage each @ 4,500 psi.

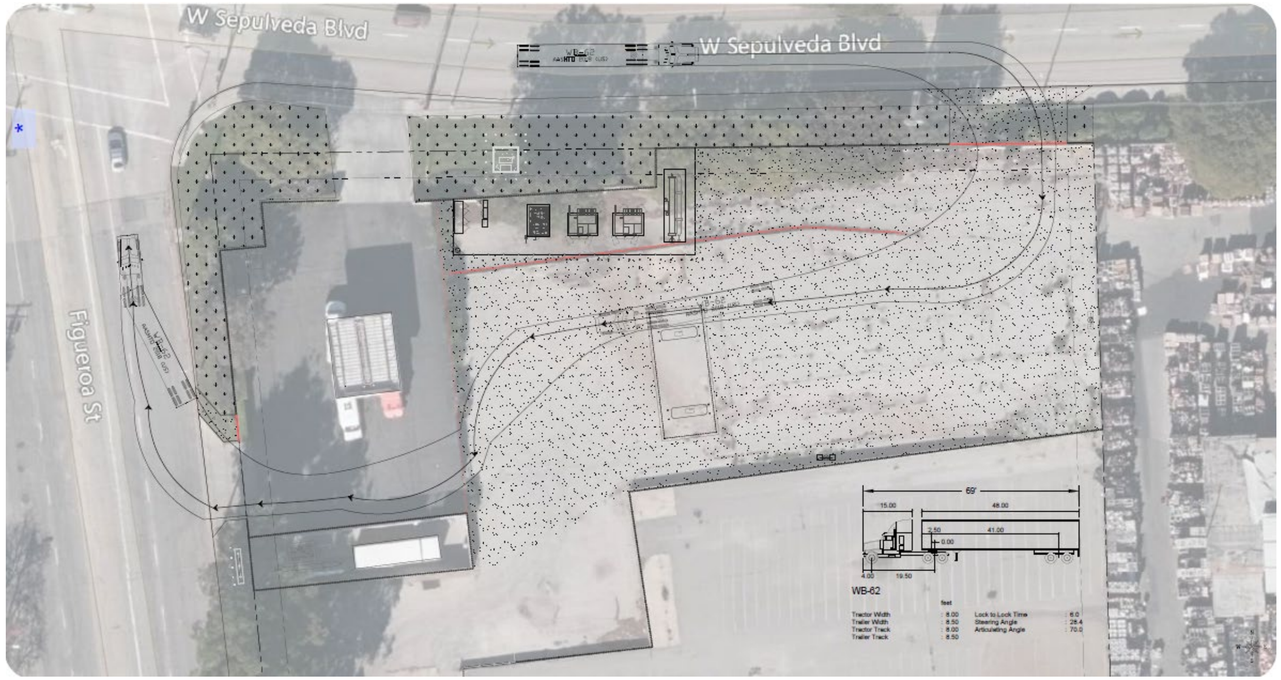
The combined nominal output is 1,254 SCFM or 10 GGEs per minute. When high pressure storage is available, the flow rate can increase to 12+ GGEs per minute.

All fast fill dispensers have built in card readers and point-of-sale devices allowing for unmanned publicly accessible fueling of vehicles.

Traffic Management:
A new 34’ entrance on W Sepulveda Blvd near the northeast end of the station. Driveway allows for Class 8 vehicles exiting the 110N Freeway onto Sepulveda a straight route to the station. Entering on the northeast provides a direct path to the new dispensers with enough space for vehicle queueing, preventing traffic build-up onto the street.

Widened the driveway on Figueroa St near the southwest end. Allows vehicles a straight path through the station where they can exit onto Figueroa St, make a left onto Sepulveda and have a straight route back onto the 110N Freeway.

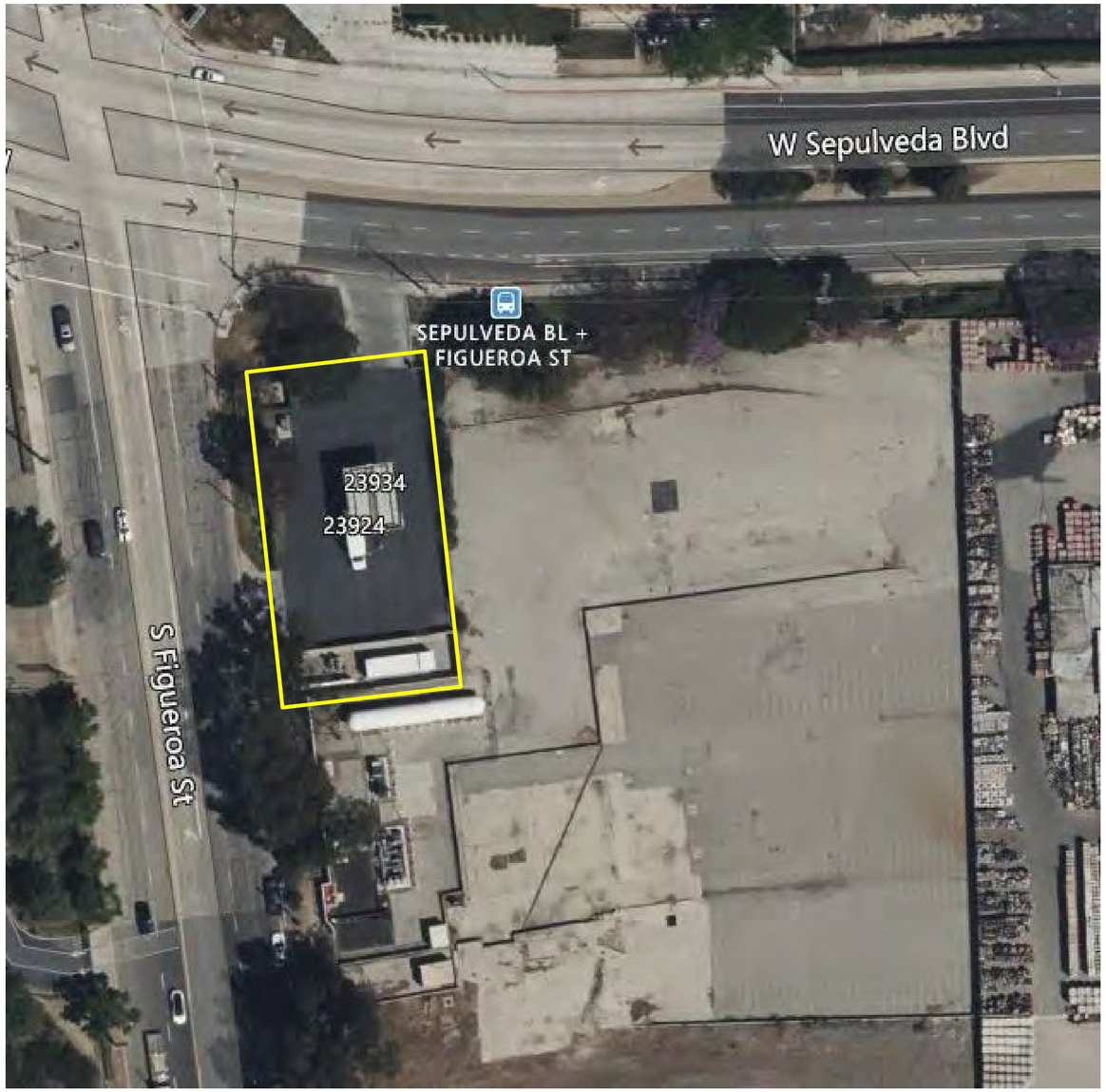
Improved Traffic Flow



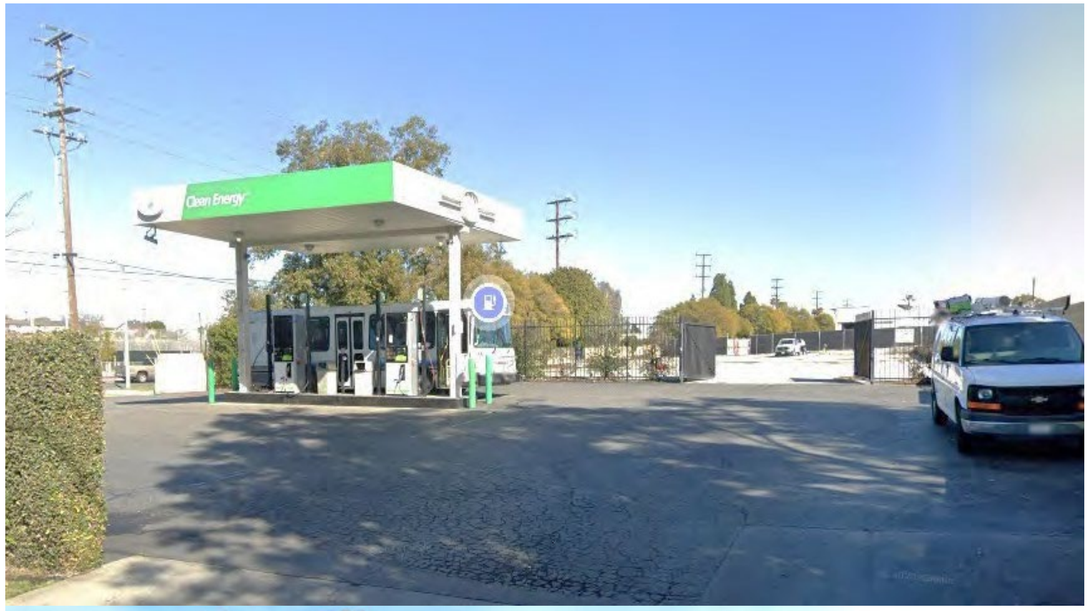
RNG Supply

Gas is stored and feed to compressors with priority over pipeline gas. Pipeline gas needed when JWPCP RNG is unavailable or has insufficient pressure

Carson RNG Station: Before & After



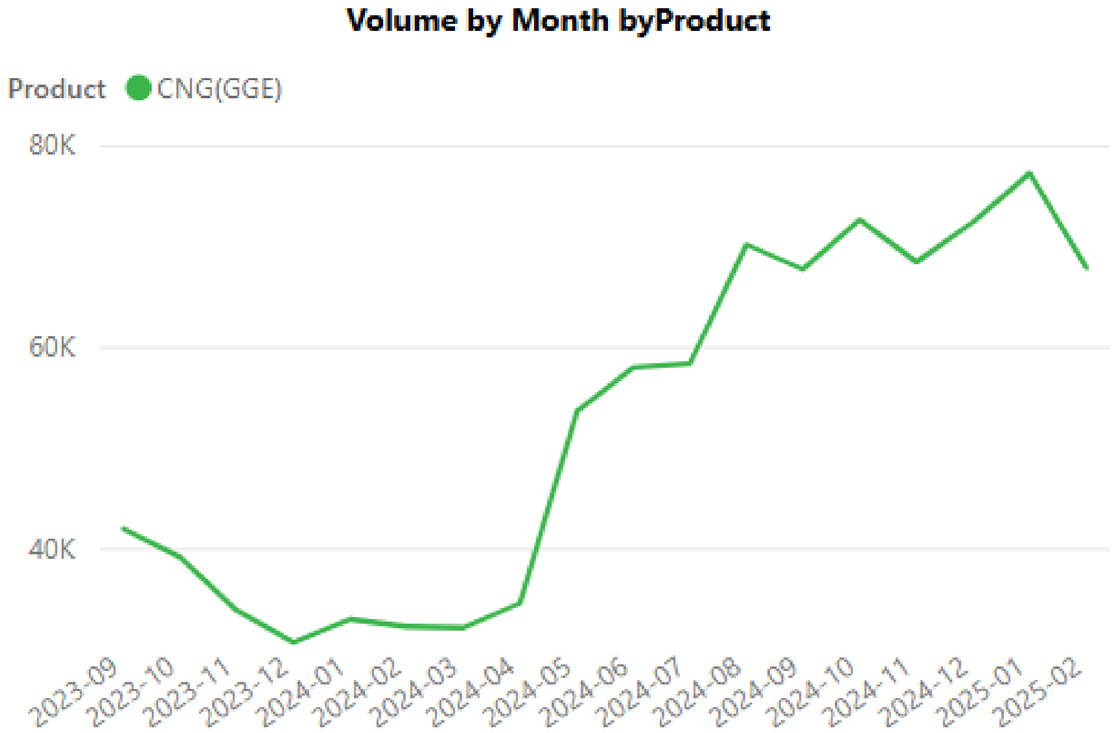
RNG Station: Before



RNG Station: After

RNG Station Updates

- Expecting 35% growth in station volume YOY (‘25 vs ‘24) as result of increased demand from LA County waste haulers and Clean Energy customers.
- Estimating 200% growth within 5 years (‘29 vs ‘24) driven by adoption of the Cummins X15N natural gas engine, strategic partnerships and supportive policies.
- Lowering greenhouse gas emissions and criteria pollutants (NO_X emissions) for all parties in the value chain.
- Opportunities for future hydrogen projects with RNG as the feedstock.

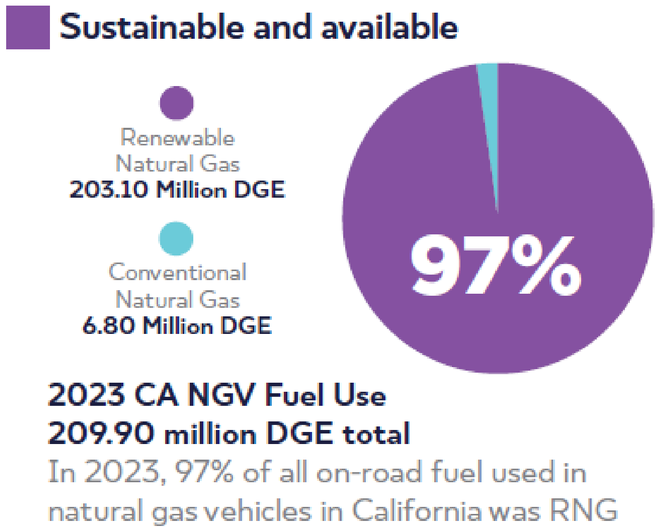


Station expansion completed in April 2024

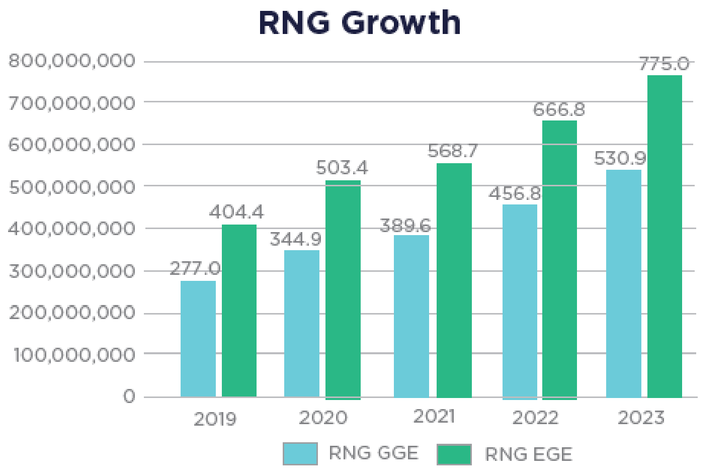
RNG Market Growth

RNG use as a transportation fuel grew 16% over 2022 volumes, increasing 92% over the last five years.

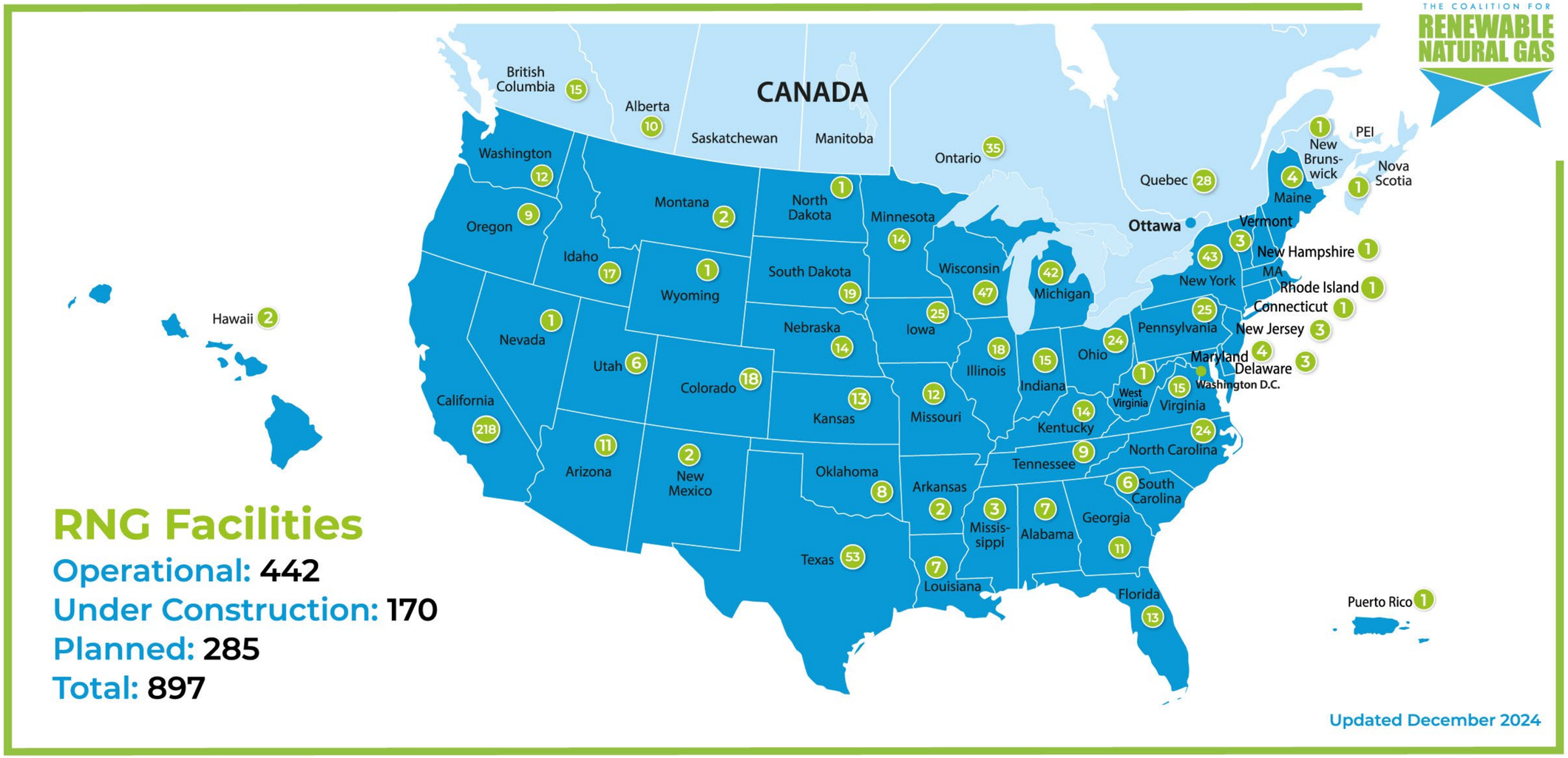
RNG made up 79% of total natural gas vehicle fuel used (675MM GGE) in 2023.



2023 CA NGV Fuel Use
209.90 million DGE total
In 2023, 97% of all on-road fuel used in natural gas vehicles in California was RNG

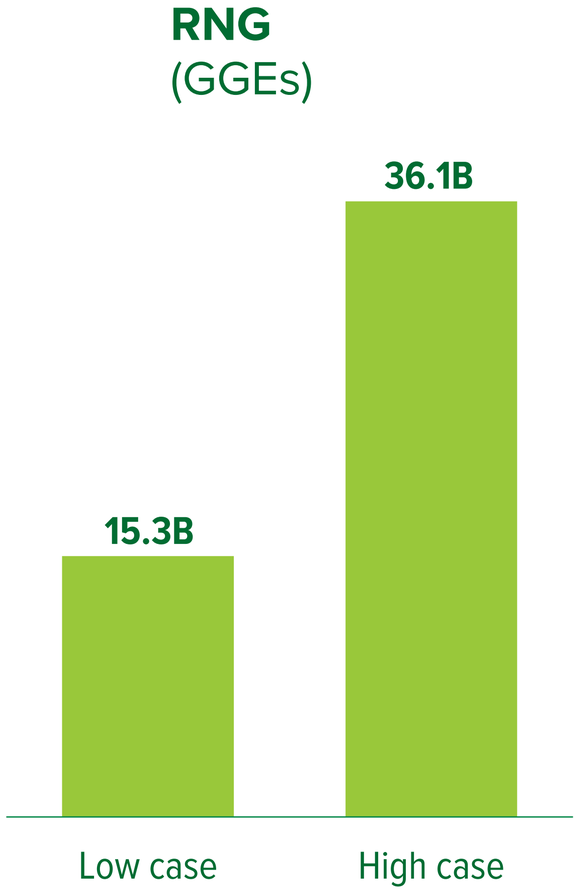


RNG Production



RNG Volume Potential in US (2040)

Carbon-for-carbon reduction compared to diesel at multiples of RNG GGEs



Source: American Gas Association and ICF
Note: Estimated gasoline gallons equivalent (GGE) assuming 125,000 mcf per gasoline gallon.

Clean Energy

Shifting carbon into reverse.