

# **OVERVIEW:** **Renewable Natural Gas (RNG) & Policy** **Impact on RNG Production**

US EPA AgSTAR - Webinar

March 27, 2019

Johannes D. Escudero

Founder & CEO

**Coalition for Renewable Natural Gas**

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



# PRESENTATION OVERVIEW

---

**RNG Coalition:** Mission, Philosophy, Position & Priority

**RNG 101:** Product, Application & Feedstock Sources

**Policy Impacts on RNG Markets:** Past, Present & Potential

**RNG Markets:** Policy Support Needed

# RNG COALITION - INTRO

---

- Non-Profit Organization (501 c6)
- Federal & State Policy Platform, Advocacy & Education Voice for Renewable Natural Gas Industry in North America
- Each Industry Sector & Academia Represented (180+)
- Members Produce 95%+ of RNG in North America
- 98%+ of RFS-Qualified Cellulosic Biofuel
- Industry Competitors Collaborating for Common Good

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



# RNG COALITION – MEMBERS (not all pictured)



Cynthia Obadia Consulting



EVERSHEDS SUTHERLAND



FORTISTAR



GENSCAPE



Hitachi Zosen INOVA



THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**

# RNG COALITION – MEMBERS (not all pictured)



THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**

# RNG COALITION – ACADEMIA MEMBERS

---



**MICHIGAN STATE**  
**UNIVERSITY**



**STANFORD**  
**UNIVERSITY**



**Stony Brook University**

UNIVERSITY OF CALIFORNIA  
**UC RIVERSIDE | CE-CERT**

**UCR**

**UC San Diego**

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



# MISSION

---

*We **advocate for increased development, deployment and utilization of renewable natural gas,** so that present and future generations have access to domestic, renewable, clean fuel & energy supply.*

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



# PHILOSOPHY

---

***Advocacy & Education informs Public Policy.***

***Public Policies influence Markets.***

***Markets drive Demand.***

***Demand determines Value.***

***Value impacts Revenue.***

***Revenue affects Sustainability.***

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**





# POSITION

---

*We support development, deployment and utilization of RNG from  
a **diversity of FEEDSTOCKS**,  
using **competing TECHNOLOGIES**,  
for all **sustainable END-USE APPLICATIONS**.*

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



## PRIORITY

---

*\*Enable the RNG industry to –  
through effective advocacy & education –  
develop & double the number of  
operating RNG projects  
in North America by 2025.*

***\*Target = 100 projects by 2025**  
(based on 47 RNG projects operating in 2015)*

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



# What is RNG?

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



# RNG PRODUCT

---

**Renewable Natural Gas**  
is commonly referred to as:  
**RNG or**  
**Biogas-derived Biomethane.**

*(Industry definitions available for:  
biogas, conditioned biogas, biomethane, RNG, R-CNG, R-LNG)*

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



# RNG PRODUCT

---

**Renewable Natural Gas**  
is a product gas derived from  
the natural decomposition of  
**organic materials**  
**in renewable waste streams.**

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



# RNG PRODUCT

---

**RNG:**  
Interchangeable substitute  
or replacement for **Natural Gas.**

**RNG (Renewable)**  
**Natural Gas (Geologic)**

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



# What is RNG produced from?

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



# RNG FEEDSTOCK SOURCES (US)

POTENTIAL SOURCES OF ORGANICS USED TO PRODUCE RNG INCLUDE:



**FOOD WASTE**

**66.5 MILLION  
TONS / YEAR**



**WASTEWATER**

**17,000  
FACILITIES**



**AGRICULTURE  
WASTE**

**8,000  
LARGE FARMS  
AND DAIRIES**



**LANDFILL GAS**

**1,750  
LANDFILLS**

WWTP / MSW (100,000 residents);  
head of cattle or as low as 150 when mixing with organics);  
Forestry Biomass and Forest Product Residue, FOGS, etc.

AD (500  
Other sources include

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



# BETTER UNDERSTANDING RNG



## RNG ACADEMY

RENEWABLE NATURAL GAS CONTINUING EDUCATION PROGRAM

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



# RNG TECHNICAL WORKSHOP & EXPO



## RNG WORKS

Technical Workshop & Trade Expo  
Sept. 11-12, 2019 • Nashville, TN  
Music City Center

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



# Policy Impacts on RNG Markets & Production

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



# 1982

**1st RNG Project Developed (Still Operating):**  
Fresh Kills Landfill (Staten Island, NY)

## RNG PAST

---

From 2005-2014, state **RPS** programs stimulated production of **RNG as a clean, renewable, electric power** to displace coal and **replace geologic natural gas.**

# 1982-2011

**30 Years Industry History:**  
31 RNG Projects Developed

*(Nearly 100% of RNG = Off-Site Electricity Generation)*

# 2011-2018

**2011: RNGC Founded (Policy Advocacy) =  
60+ New RNG Projects Developed**

## RNG RECENT

---

Increasingly, federal & state policy programs (**RFS, LCFS, CFP**) are driving production of **RNG as an ultra-low carbon fuel** for a new generation of medium- and heavy-duty Natural Gas Vehicles.

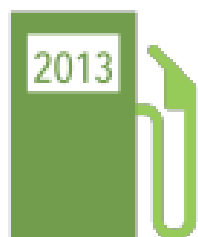




# RNG RECENT

Due to favorable policies,  
RNG production for transportation fuel has  
increased 10x since 2013

25.9 M EGE



53 M EGE



142 M EGE



190.3 M EGE



240 M EGE\*

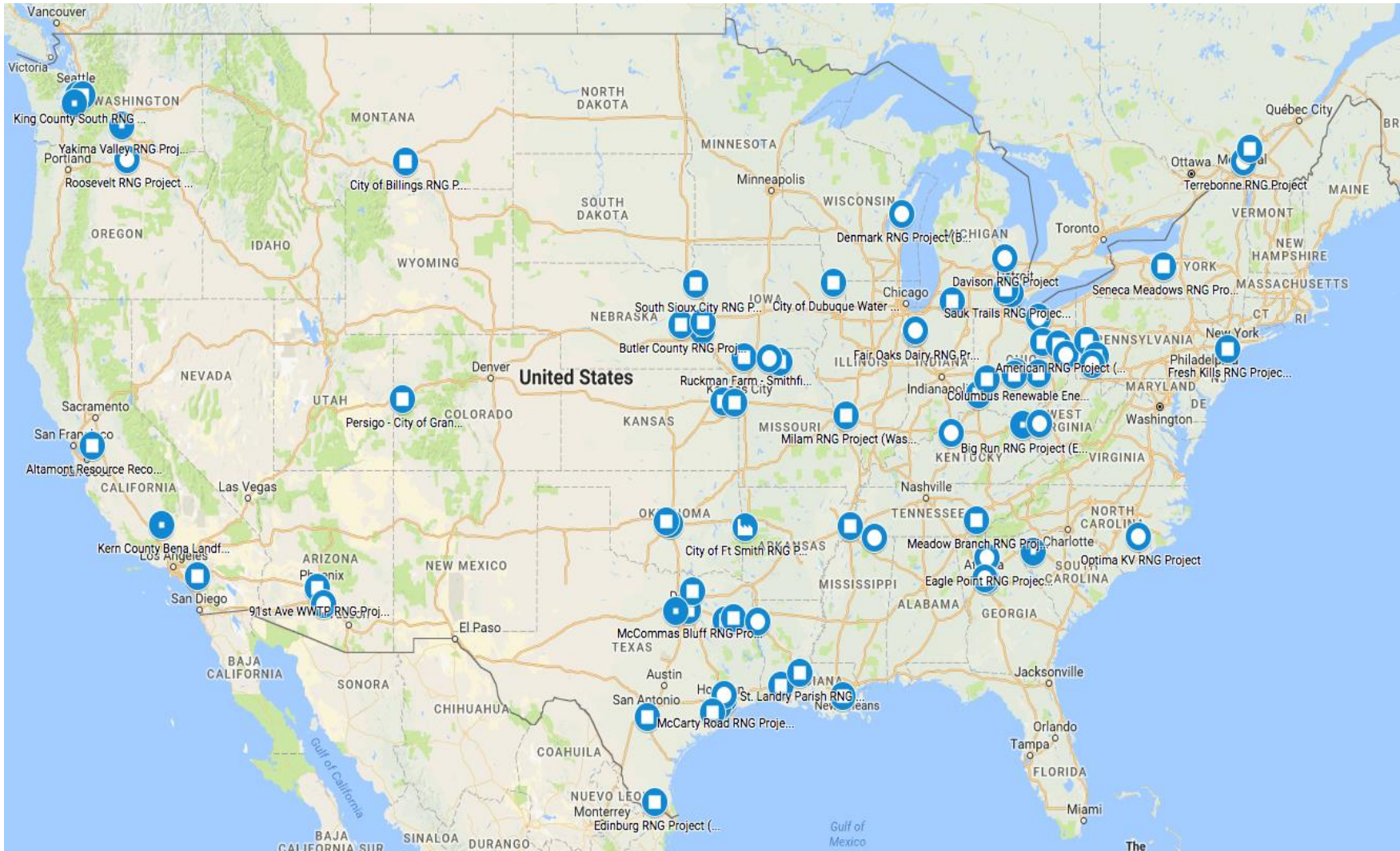


288 M EGE\*\*



THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**

# RNG TODAY



THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**

# 2019

**96+ RNG Projects Now Operating\***

**69+ RNG to Transportation Fuel**

**17 RNG to Electricity or Heat**

*(72% Transportation Fuel & 28% Power Generation)*

*\*85% growth compared to projects built between 1982 and 2014*

# 2019

**22+ New RNG Projects under Construction**

**40+ Projects in Development**

**(US:32, CA:8)**

# RNG POTENTIAL (CA)



CALIFORNIA NEEDS  
RENEWABLE ELECTRICITY AND  
**RENEWABLE GAS**

60% of CNG trucks run on  
renewable gas.

[socialgas.com/rg](http://socialgas.com/rg) | [RNGcoalition.com](http://RNGcoalition.com) | [cngvc.org](http://cngvc.org)

Represented by **Mercury**

© 2017 Southern California Gas Company. Trademarks are property of their respective owners. All rights reserved. NT00051A 0517

**SoCalGas**  
A Sempra Energy utility

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**

California Natural  
Gas Vehicle Coalition

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**

# RNG POTENTIAL (CA)

---

# 2018-2030

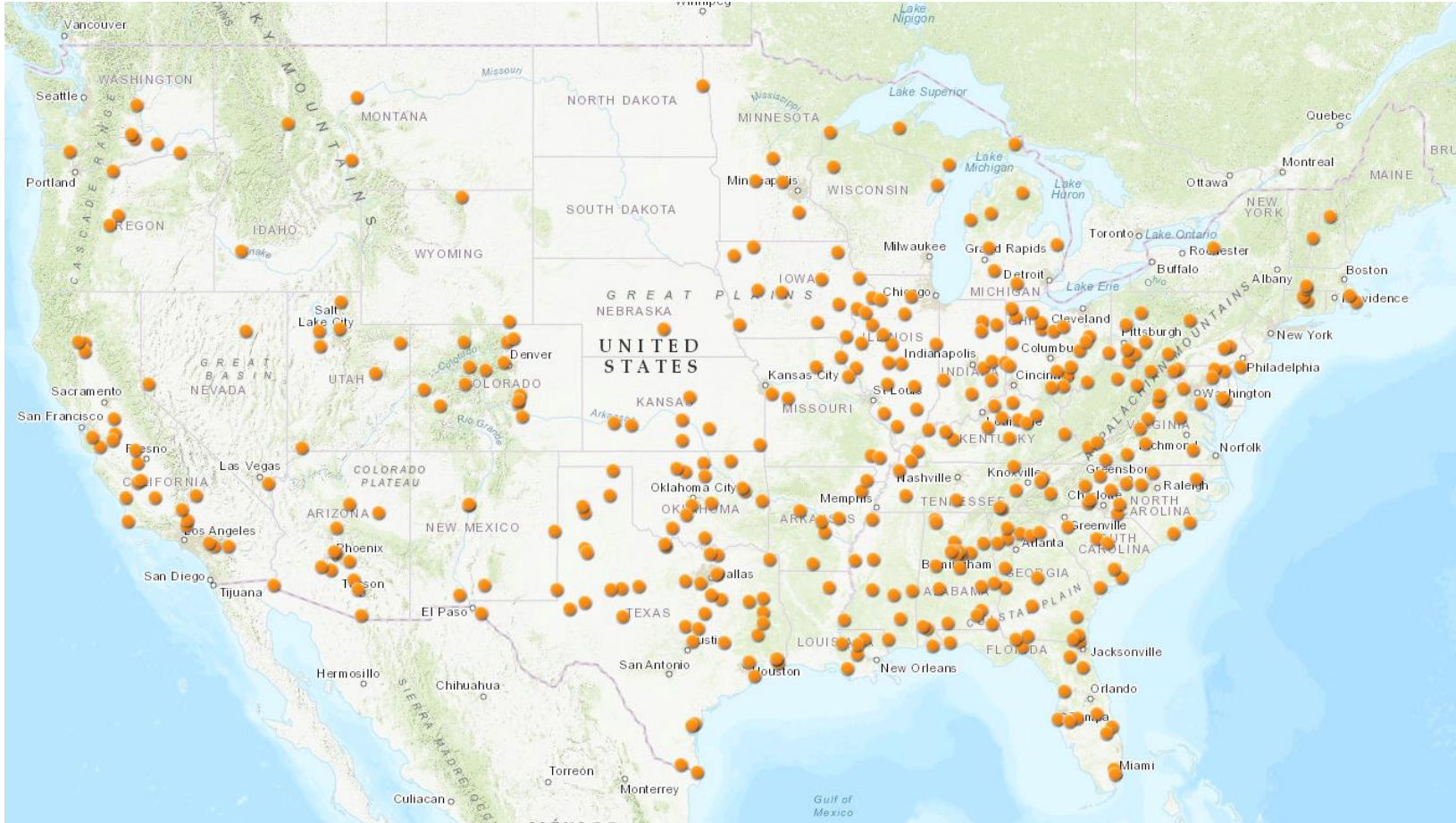
200 Dairies + 100 WWTP + 50 Landfills =  
**+ 1 – 2 billion DGEs of RNG**

*Enough RNG to displace 15-60%+ of Diesel consumption  
or power 2-3 million homes annually (CA)*

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



# RNG POTENTIAL (US)

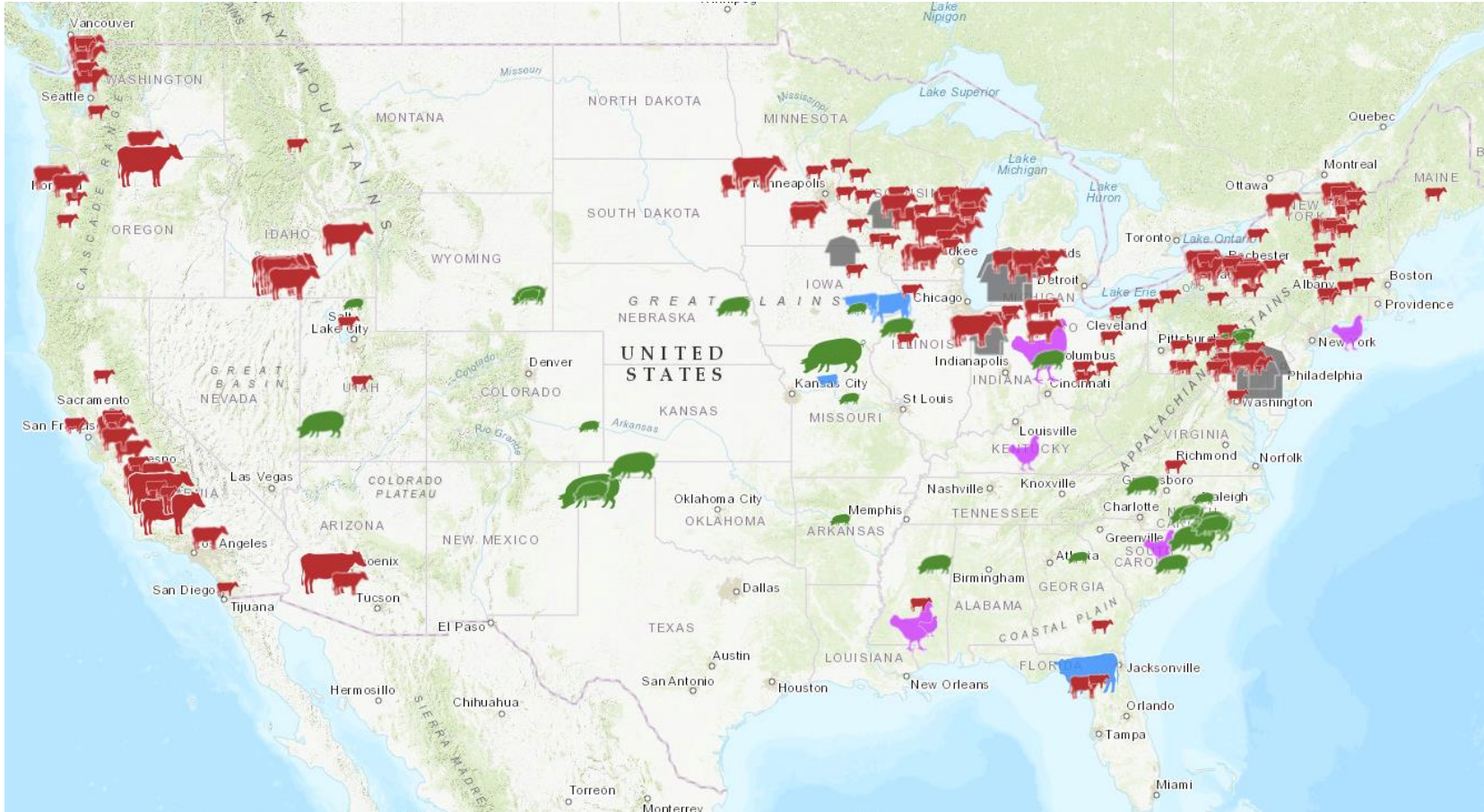


**637 LFG Projects; 398 Candidates:**  
(US EPA Landfill Methane Outreach Program)

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



# RNG POTENTIAL (US)



**265 Livestock AD Projects:**  
(EPA AgStar – Beef, Dairy, Hog, Poultry)

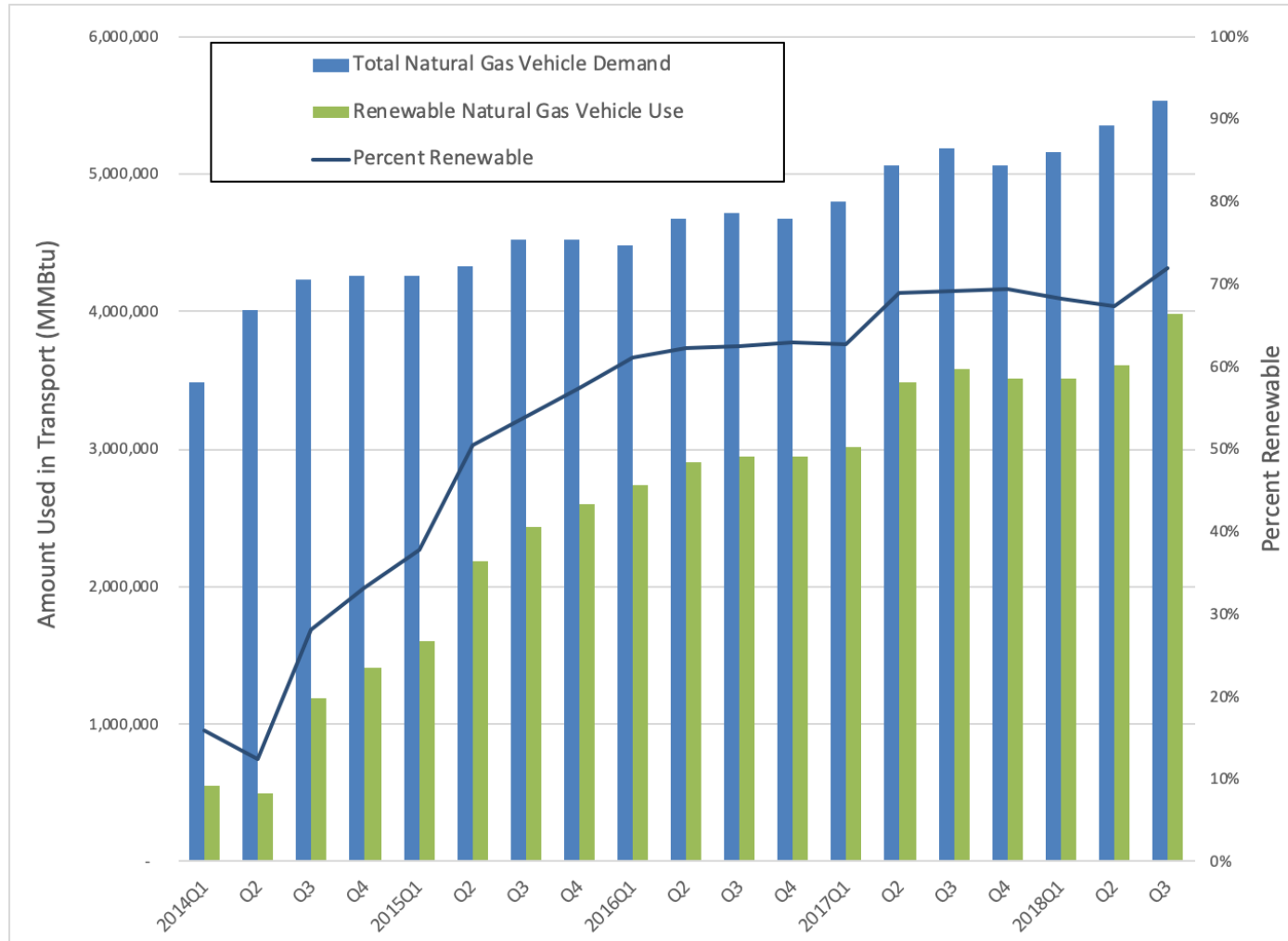


# RNG Markets: Policy Support Needed

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



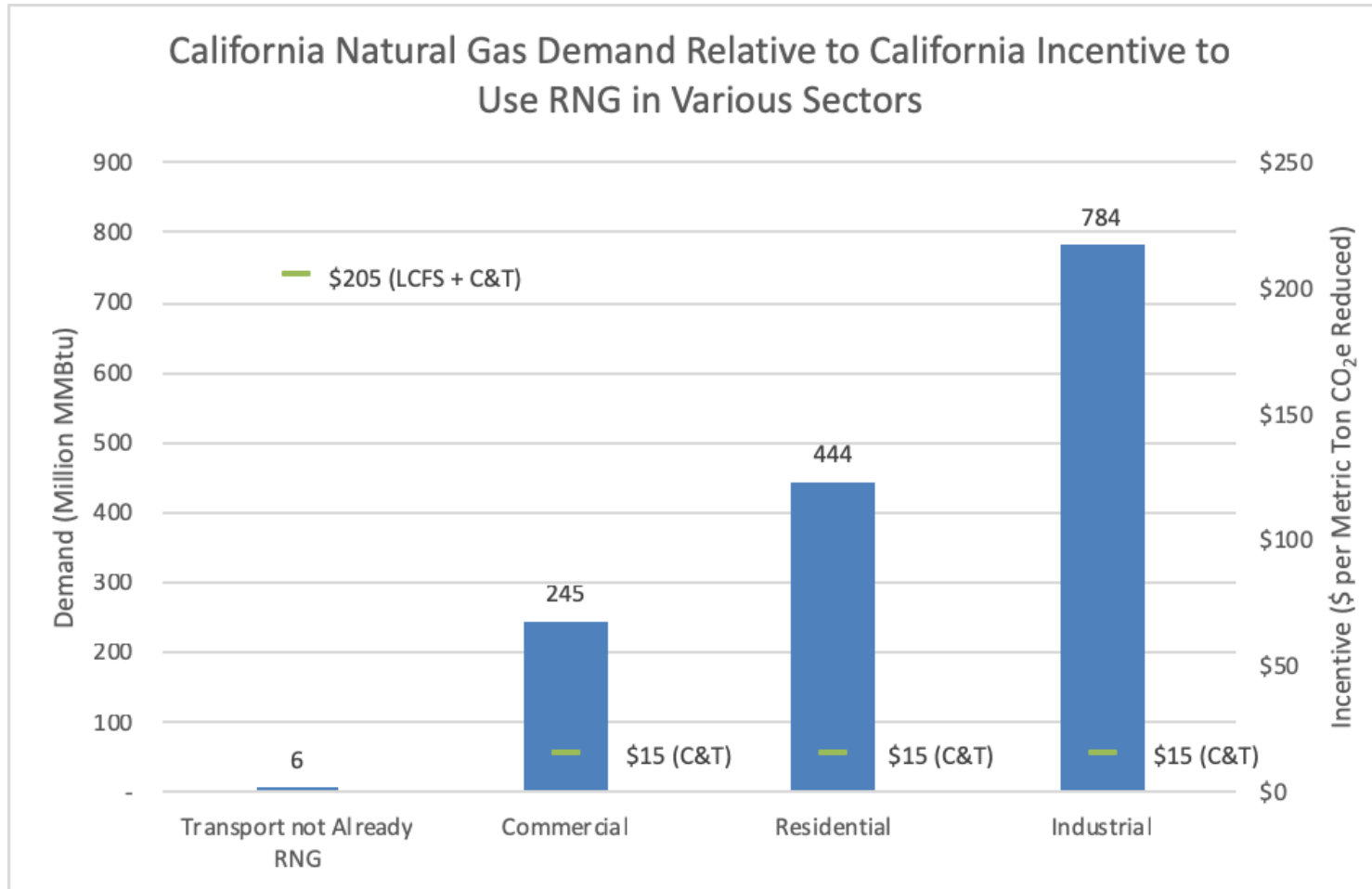
# RNG IS SATURATING EXISTING VEHICLE DEMAND IN CALIFORNIA



Notes: Values in LHV

Source: [https://www.arb.ca.gov/fuels/lcfs/dashboard/quarterlysummary/quarterlysummary\\_013119.xlsx](https://www.arb.ca.gov/fuels/lcfs/dashboard/quarterlysummary/quarterlysummary_013119.xlsx)

# OTHER SECTORS REPRESENT GREATER DEMAND, BUT CURRENTLY LACK SIMILAR POLICY SUPPORT



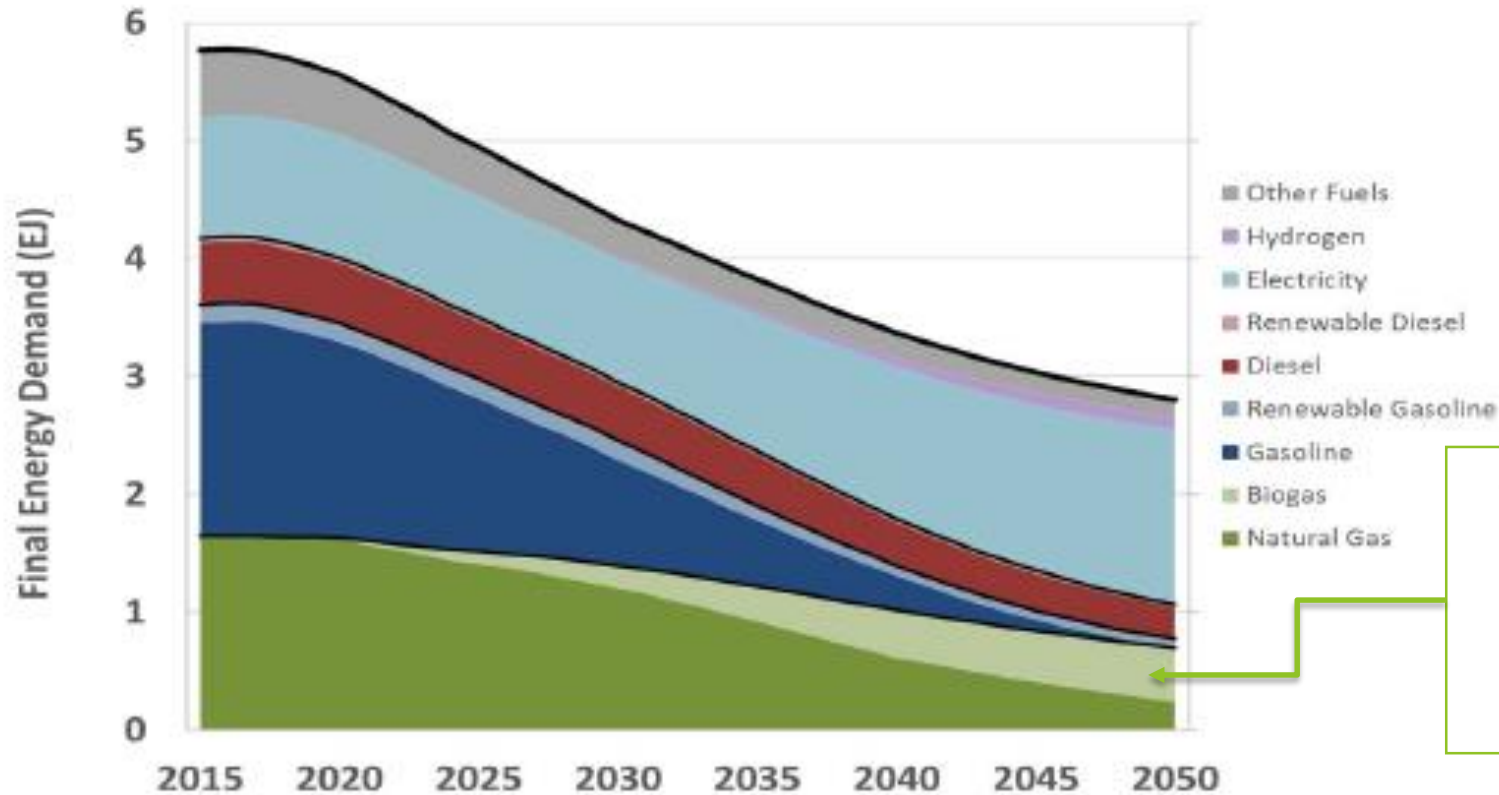
Notes: Demand values in LHV

Source for demand data in other sectors: *EIA Natural Gas Consumption by End Use*

[https://www.eia.gov/dnav/ng/ng\\_cons\\_sum\\_dc\\_u\\_sca\\_m.htm](https://www.eia.gov/dnav/ng/ng_cons_sum_dc_u_sca_m.htm)

# STUDIES THAT PREDICT HEAVY ELECTRIFICATION ALSO REQUIRE DRAMATIC GROWTH IN RNG

Figure 7: Final Energy Demand by Fuel Type in the High Electrification Scenario



0.5 EJ = 474 Million MMBtu of RNG

We need at least 30x current CA RNG use!

Figure Source: *Deep Decarbonization in a High Renewables Future: Updated Results from the California PATHWAYS Model*, Prepared by E3 for the California Energy Commission.  
<https://www.ethree.com/wp-content/uploads/2018/06/Deep-Decarbonization-in-a-High-Renewables-Future-CEC-500-2018-012-1.pdf>

# SOME HELPFUL SUGGESTIONS FOR POLICYMAKERS (REGULATORY WISH LIST!)

---

- Continue existing, successful programs (including RFS, LCFS, RPS, etc.)
- Implement a Renewable Natural Gas Standard (in line with legislative direction from SB 1440, Hueso - CA), or similar policy. Consider aligning the accounting with the Low Carbon Fuel Standard.
- Establish a world-leading strategy to decarbonize the gas pipeline system
- Set the stage for comprehensive policy by encouraging voluntary programs for RNG—such as the one recently proposed by Southern California Gas Company
- Communicate with other jurisdictions, such as Canada, about how to apply GHG intensity standards in non-transport sectors
- Consider allowing non-transport RNG use to count toward jurisdictional organic waste product procurement targets
- Be mindful of signals sent to the RNG community related to push for electrification in the transport sector
- Consider programs to incent RNG use from non-core gas buyers

# RNG POLICY, MARKETS & STRATEGY



**RNG 2019**

The Renewable Natural Gas Conference  
For North America's Industry Executives  
December 2-5, 2019 • Monarch Beach Resort

THE COALITION FOR  
**RENEWABLE  
NATURAL GAS**



# PRESENTER CONTACT

---

## JOHANNES D. ESCUDERO

**RNG Coalition**  
Founder & CEO

916.588.3033  
Johannes@RNGCoalition.com

RNGCoalition.com



**Escudero & Associates, Inc.**  
President

916.520.4RNG (4764)  
Info@GoEscudero.com

GoEscudero.com

