

Committee on Gas



"You regulators are never satisfied. You wanted more transparency, so we put more windows in the building."





“In light of current market conditions,
I’ve diversified your portfolio to include
Lotto tickets and bingo chips.”



So close...



AND THEN THEY ASKED

FOR MORE FINANCIAL AID





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Growth Initiatives

Mississippi



NARUC Annual Meeting - Baltimore

November 13, 2017

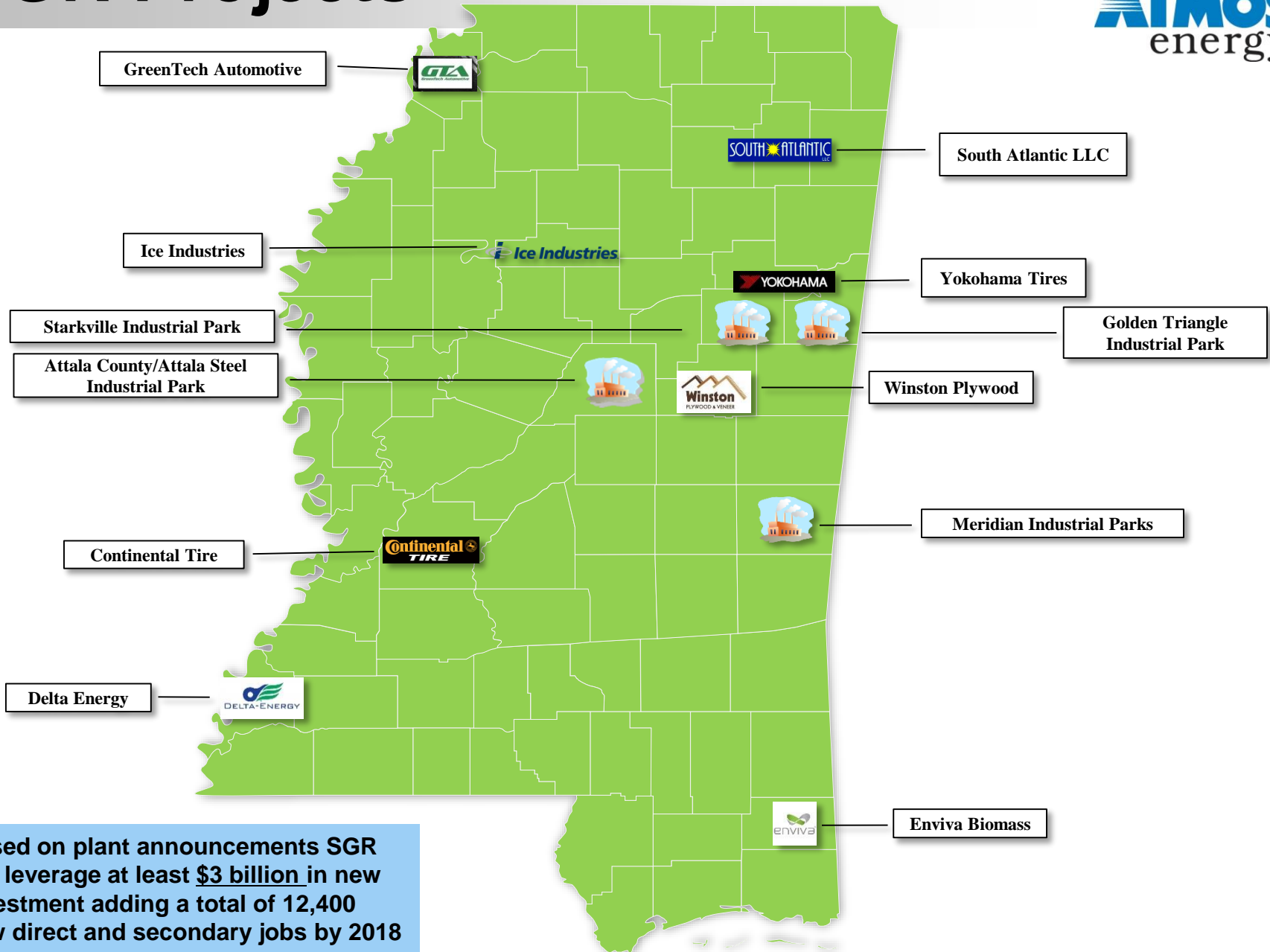


Supplemental Growth Rider



- **Tariff supports job creation**
- **\$5M annual capex to land new plants, expand industrial parks**
- **5 year pilot with 12% ROE on investment for 10 years**
- **PSC approval required to exceed \$5M annual spend**
- **Key tool for Mississippi's economic development**
- **Statute waives 'used and useful' for economic development projects**

SGR Projects



Based on plant announcements SGR will leverage at least **\$3 billion** in new investment adding a total of **12,400** new direct and secondary jobs by 2018

Funding Rural Expansion



Utilize incentive mechanisms to fund rural growth

- PBR – Performance-Based Ratemaking mechanism
- AMP – Asset Management Plan
- Net savings/costs credited to PGA

PBR – incentive gas cost ratemaking - use of innovative gas supply strategies to reduce gas costs and reward utility performance

- Bypass, Market Segmentation, Capacity Release

AMP – asset manager assumes the risks of innovative management of storage assets

Proposal – Five Year Pilot



Utilize PBR savings to fund main extensions

- \$3000 per customer (150 feet x \$20/foot)
 - Portfolio average
 - \$4000 max for any customer
- Current tariff funds 40 feet

Rate Base service line extensions

- \$2000 per customer (200 feet)
- Current tariff funds 75 feet
- Self-funding



- Fund up to 1000 new premises per year (\$5 million)
- 5000 new premises over five years (\$25 million)

Promotions & Conversion Financing



Conversion costs \$2000 for in-home piping and new gas appliances

Evaluating options to offer interest rate buy-down or more favorable financing

- AMP credits to promote/incentivize conversions or to provide direct funding to low income conversions

Leverage up to \$10 million in conversions

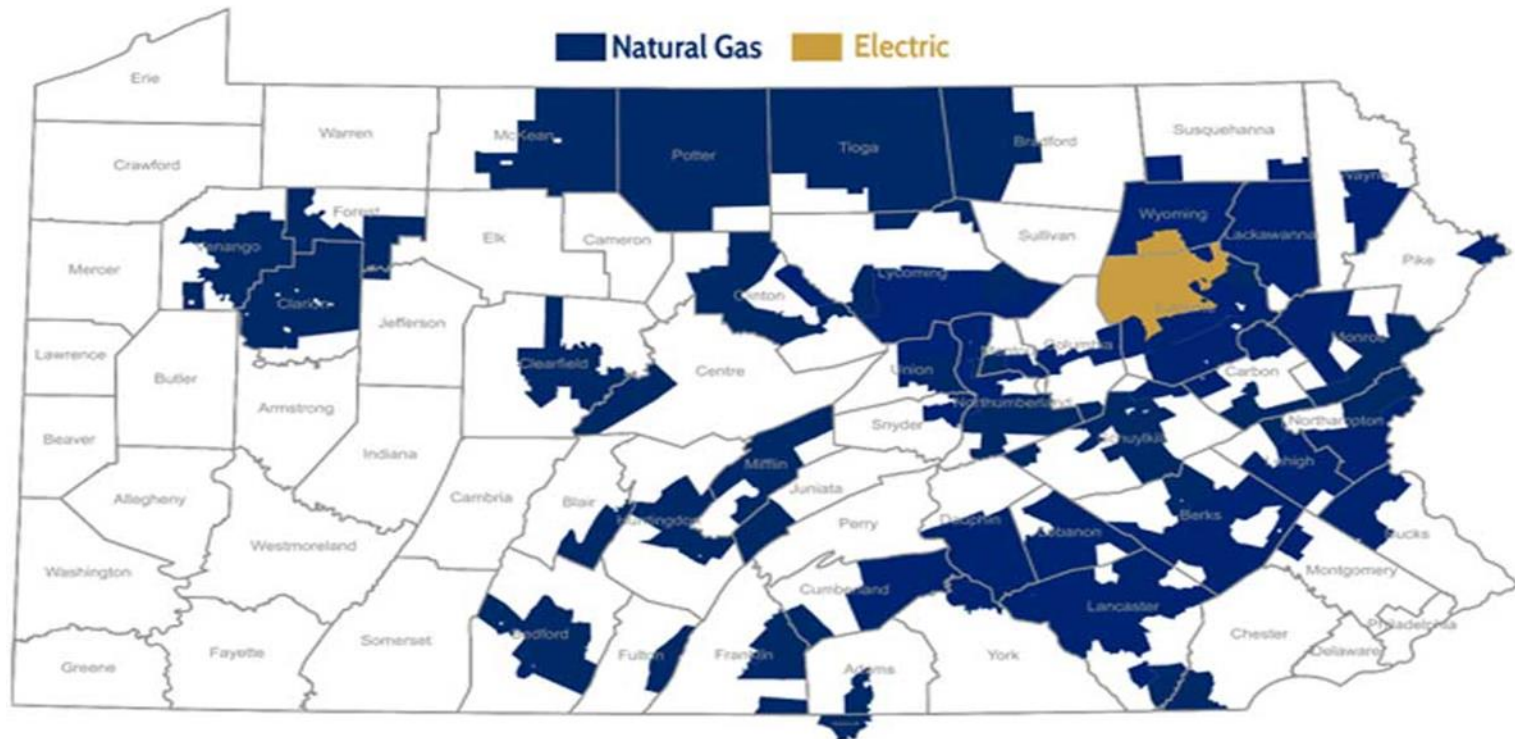
Total investment \$35,000,000 over five years

Expanding the Reach of Natural Gas

Paul Szykman
Chief Regulatory Officer
UGI Utilities, Inc.

UGI Utilities serves a large portion of PA

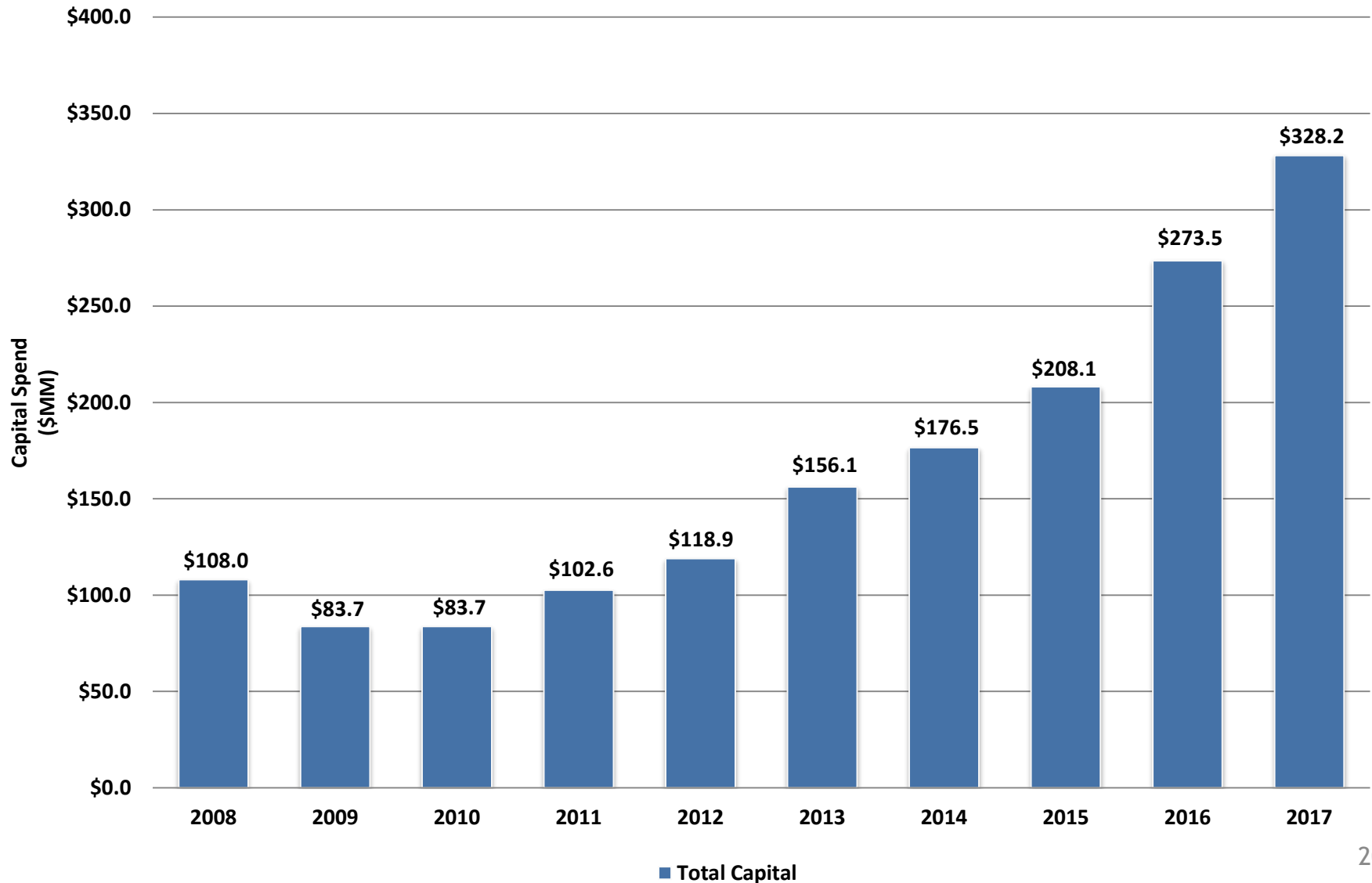
Total Gas Customers	636,190
Total Electric Customers	62,084
Miles of UGI Gas Main Infrastructure	13,000 miles



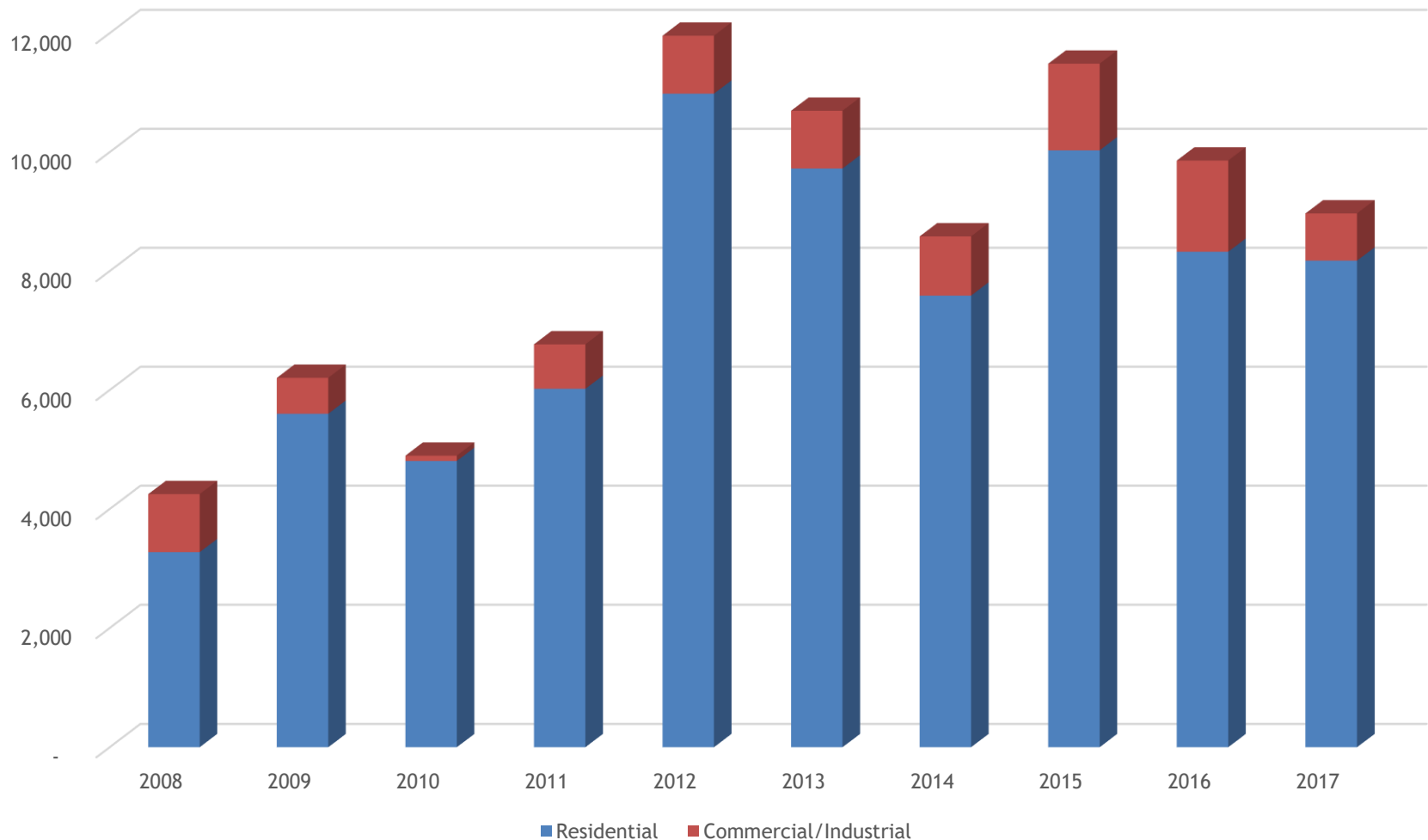
Supply - The Effect of Marcellus Shale

- Pennsylvania has become the second largest producer of natural gas in the U.S.
- More than 90% of the natural gas UGI Utilities delivers to our customers is produced in the Marcellus Shale Region
- Between 2008 and 2017, UGI converted approximately 90,000 households to natural gas heating
- The reduction in greenhouse gas emissions attributable to the these conversions is the equivalent of removing approximately 103,000 passenger vehicles from the roads for a year
- Current UGI customers saved approximately \$585MM in 2017, when compared to natural gas costs in 2008.
- Increased awareness by consumers

Capital Spend - A Ten Year Look



Net Annual Gas Customer Growth



Positioned for Continued Growth

- **Lackawanna Energy Center**
 - New natural gas fired 1,480 MW combined cycle plant located in Lackawanna County
- **Lancaster General CHP**
 - 3.5MW cogeneration system
 - Produces 75 to 85 percent of the electricity required by the hospital
 - Fires a new heat recovery steam boiler to handle all the steam and hot water needs of the facility
 - 97 percent cleaner than standard, highway-use diesel fuel
- **Dupont GET Gas**
 - An expansion project in Luzerne County that has made gas available to 323 homes and businesses

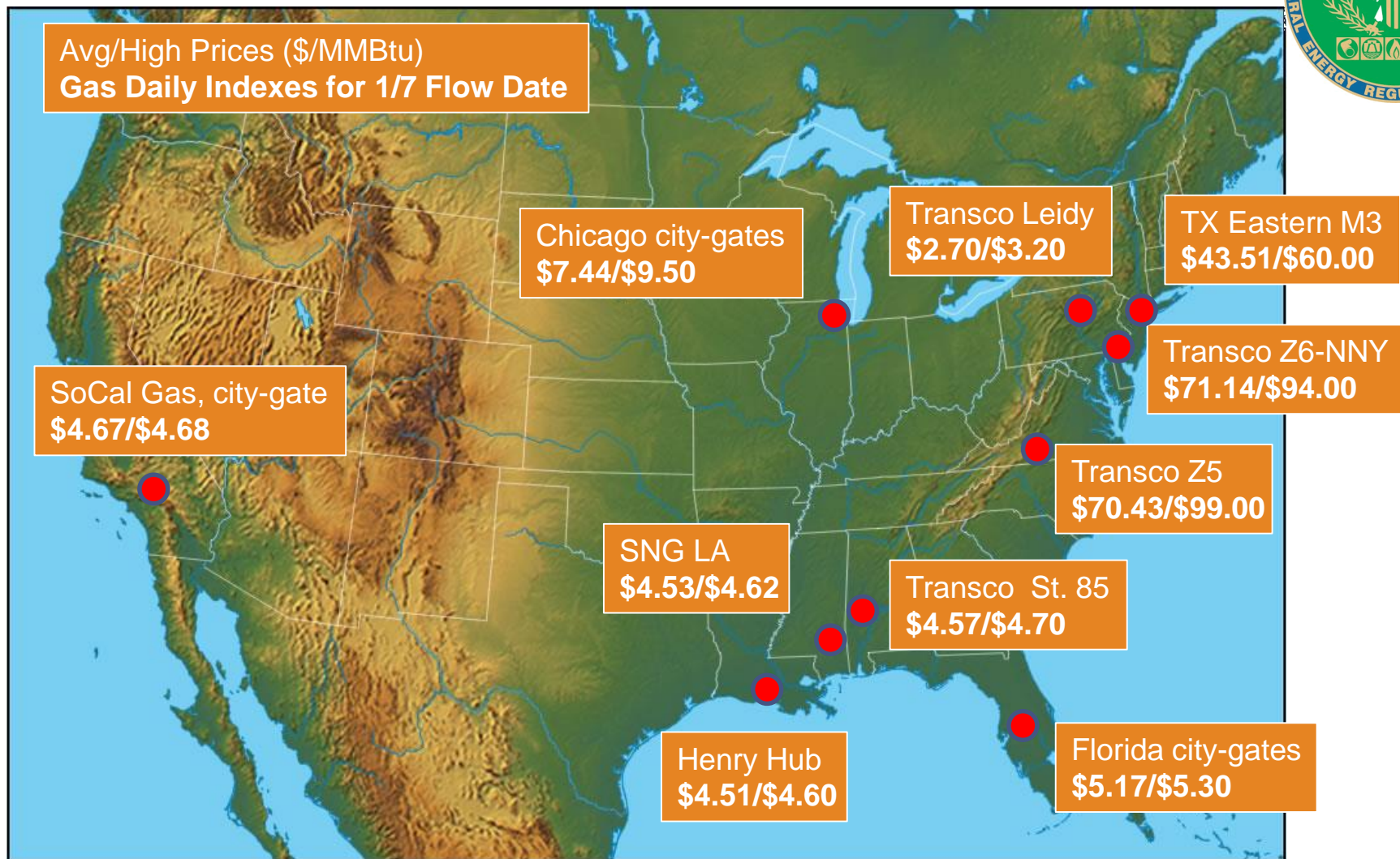
Regulatory Programs Driving Growth

- Growth Extension Tariff (GET Gas)
 - Entering 4th year of the Program
 - Approximately 36 miles of main installed program to date
 - 3,599 parcels now have access to natural gas
 - 78 projects slated for 2018 & 2019
- Energy Efficiency & Conservation program (EE&C)
 - Prescriptive rebates and custom incentives promoting efficient use of natural gas
 - \$38 million program over 5 years
- Technology & Economic Development rider (TED)
 - Negotiated rider available to non-residential customers to address project-specific economic requirements
 - Supports the expansion of new technologies such as CHP and CNG, develops brownfields, and supports economic development
 - Three-year pilot program

Questions?

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Basis Blowout - Jan 7, 2014

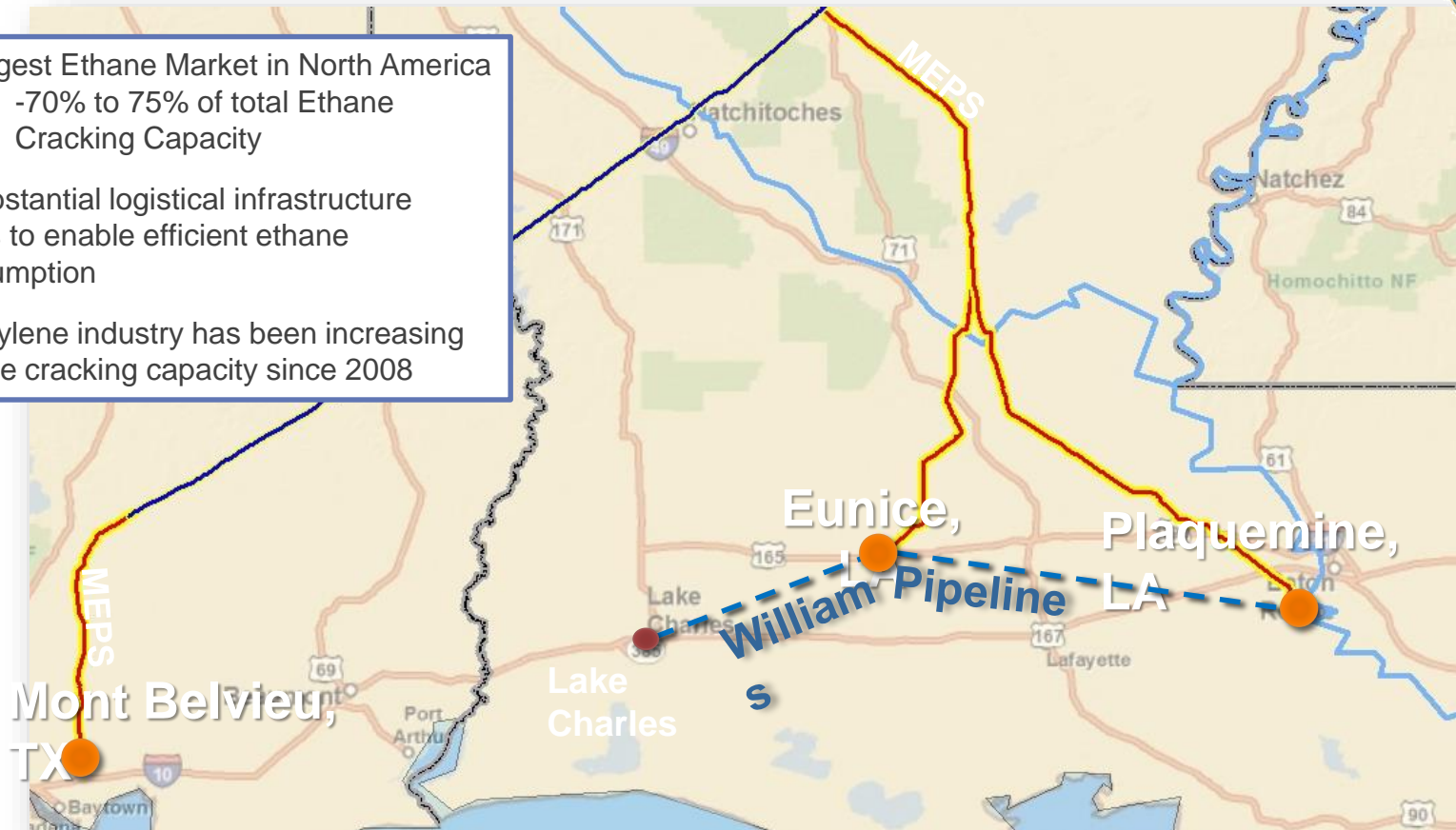


Why isn't the rest of the Northeast benefitting from Marcellus natural gas?
Short answer: Not enough pipelines.

Gulf Coast is Premium Ethane Market



- Largest Ethane Market in North America
-70% to 75% of total Ethane Cracking Capacity
- Substantial logistical infrastructure exists to enable efficient ethane consumption
- Ethylene industry has been increasing ethane cracking capacity since 2008



	Mt. Belvieu	Louisiana Markets
Ethane Extraction Capability	<ul style="list-style-type: none"> • 197 million BPD • 22% of US Cap 	<ul style="list-style-type: none"> • 361 million BPD • 40% of US Cap



The New Ethane Solution: East Cost Markets

MARINER WEST:

- Ethane from MW Liberty Plant (Houston, PA) to Sarnia, ONT
- 25 mile pipeline to Vanport, PA + modified Sunoco Logistics pipeline
- 50,000 Bbls/d

Sarnia

MARINER EAST:

- Ethane from MW Liberty Plant (Houston, PA) & Majorsville, WF Plant to Sunoco site in Philadelphia + barged to Europe or GOM
- Conversion of 250 mile 8" refined products line
- 50,000 Bbls/d

Philadelphia

To Europe

COVE POINT LNG

- Liquefies natural gas to export to other countries
- 860,000 dekatherms per day from pipeline interconnects
- Exports of 0.77 bcfd
- 2017 in-service date

Gulf Coast

More than 80% of the NGL in the U.S. are processed in 2 states. Why?



A Call to Action

- Encourage responsible pipeline development
- Create opportunities for enhanced communication between midstream operators and other key stakeholders
- Ensure that necessary resources are available for midstream permitting, planning, and inspection
- Make environmental stewardship and pipeline safety a priority

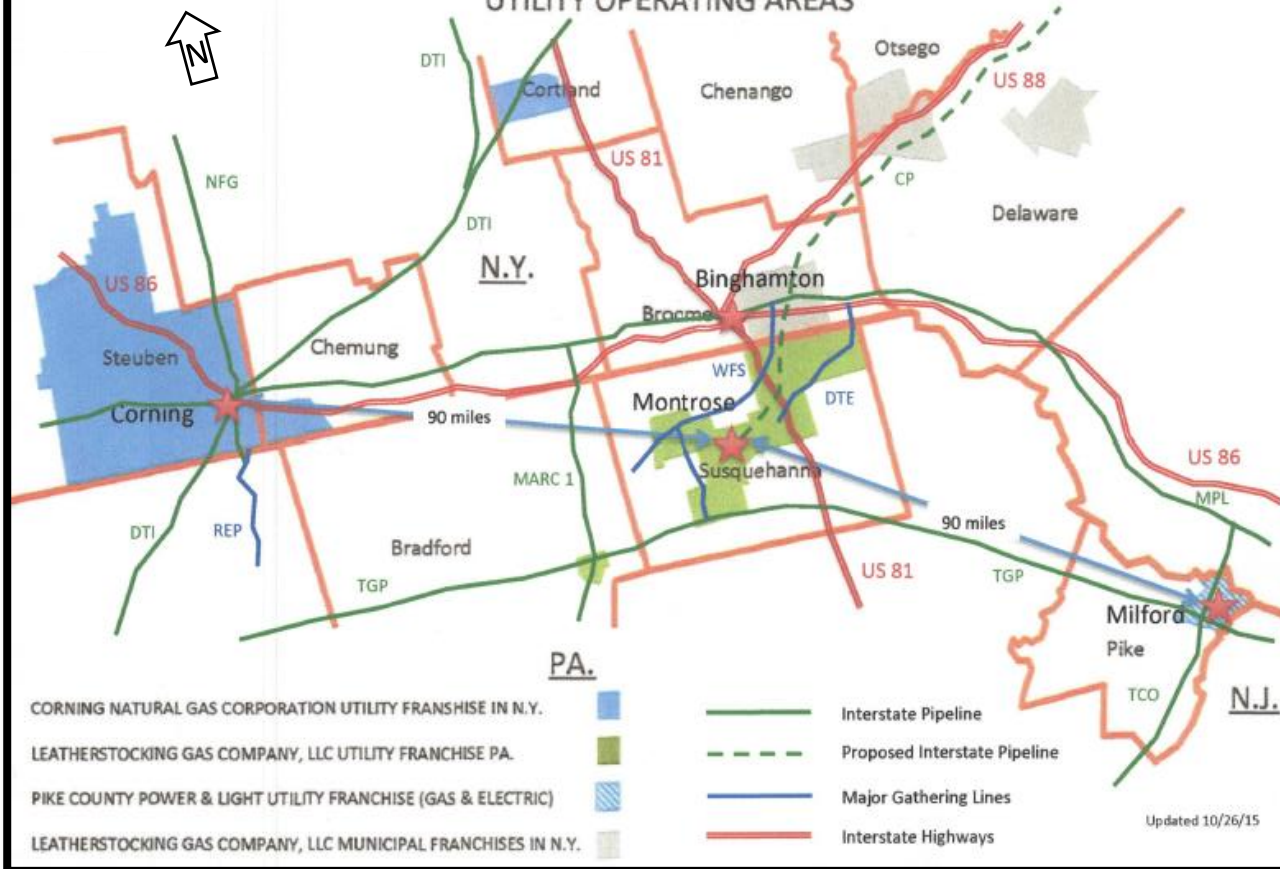
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Regulated Industries

Who We Are

CURRENT CORNING NATURAL GAS HOLDING CORPORATION UTILITY OPERATING AREAS



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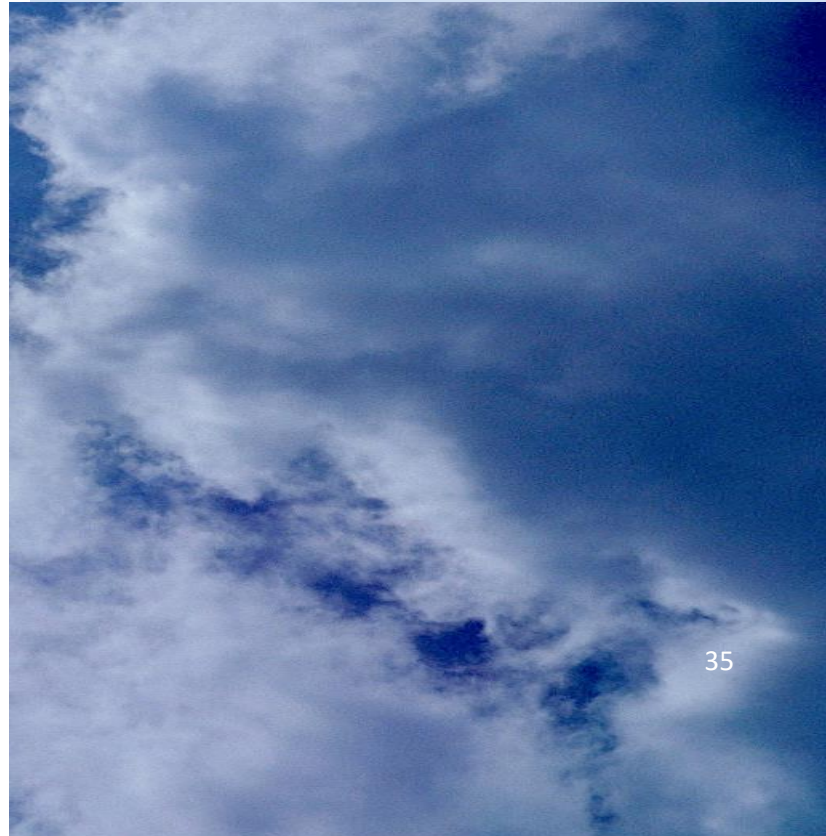
Methane Emissions Management and the Natural Gas System

Deanna Haines, Director of Gas Engineering
Southern California Gas Company and San Diego Gas & Electric

NARUC 129th Annual Meeting and Education Conference
November 13, 2017

PREVIEW

- **WHO WE ARE**
- **REDUCING METHANE EMISSIONS**
 - **FROM THE NATURAL GAS DISTRIBUTION SYSTEM**
 - &**
 - **BY LEVERAGING THE NATURAL GAS DISTRIBUTION SYSTEM**



WHO WE ARE...

SoCalGas & SDG&E Service Territory



- **Largest natural gas distribution** utility in the US
- An active part of the community for more than **150 years**
- Serve **12 counties** (over 500 communities) and more than **21 million** people
- Over **5.8** million gas meters
- More than **12,000 employed**

WORKING COLLABORATIVELY AND INDEPENDENTLY TO REDUCE METHANE EMISSIONS



Collaborating with the CPUC to cost-effectively enhance infrastructure safety while yielding environmental benefits



Funding Research, Development & Demonstration (RD&D) for new technologies, and greater efficiencies



Modernizing the system

Installed ~5.8 million Advanced Meters

*Eliminated Cast Iron two decades ago



Proposing Accelerating leak surveys from five year to annual cycles for vintage plastic pipe in latest general rate case



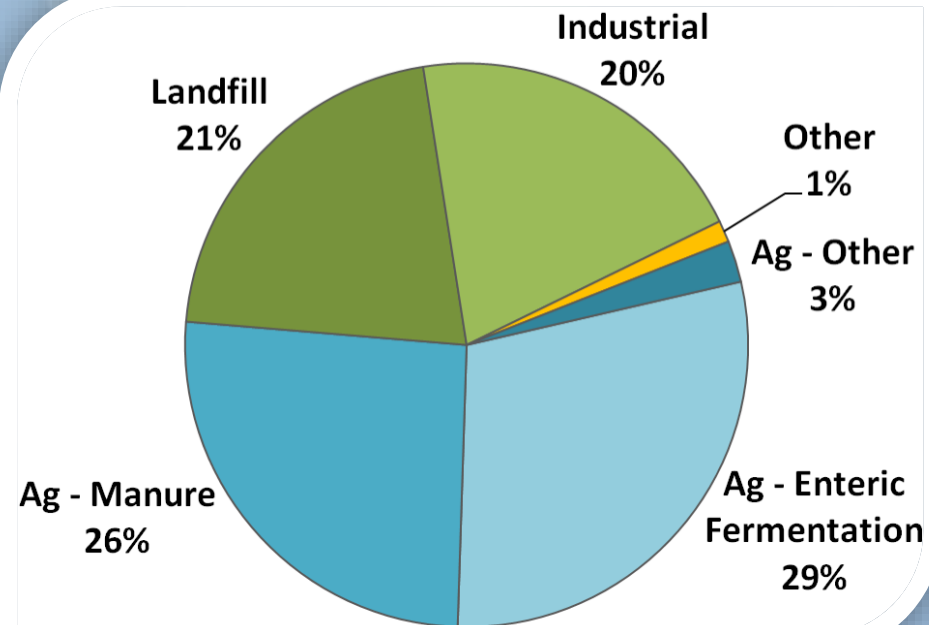
Partnering with academia, regulators and industry on studies and programs:

Being Part of the Solution

OPPORTUNITY EXISTS FOR THE CAPTURE OF RENEWABLE SOURCES OF METHANE



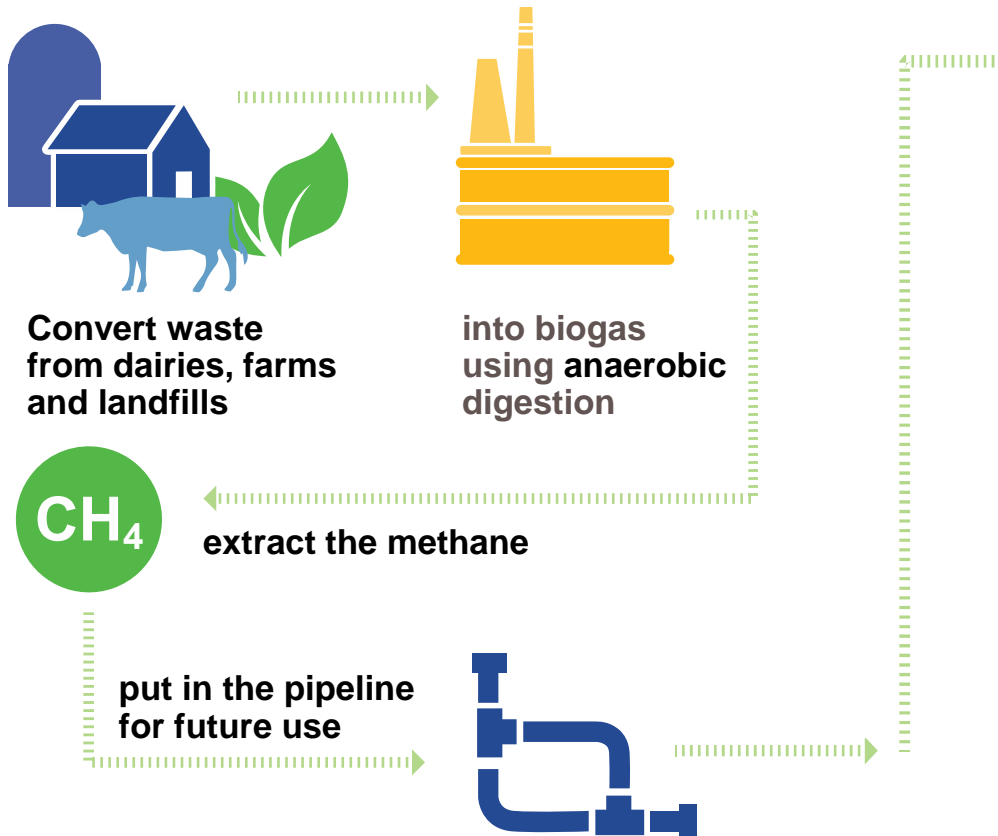
CA 2015 METHANE EMISSIONS*



*Source: California Air Resources Board (CARB) 2017 Greenhouse Gases Emissions Inventory

RENEWABLE

NATURAL GAS



WHAT'S POSSIBLE

POWER

2-3 million homes

REPLACE

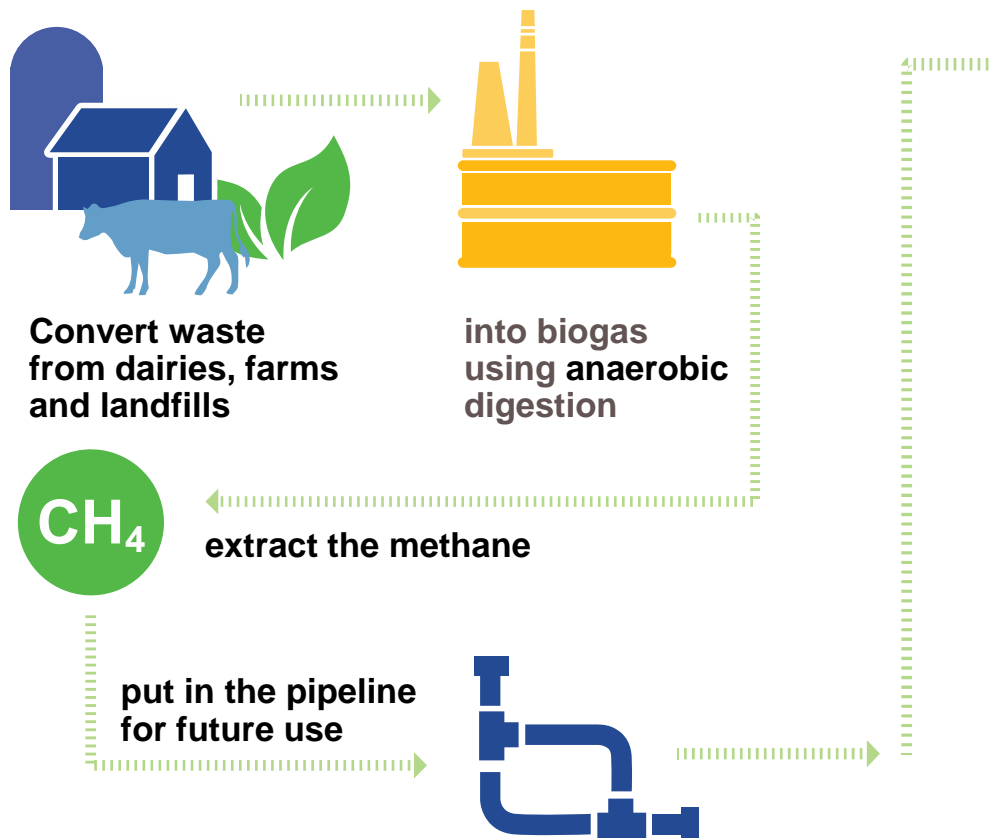
75% of all diesel used by CA vehicles

When used for transportation, Biogas from food and green waste can actually

REMOVE GHGs from the atmosphere

RENEWABLE

NATURAL GAS



SoCalGas and CR&R Environmental Announce Construction of Pipeline to Provide Carbon-Neutral Renewable Natural Gas

Renewable Gas from Anaerobic Digester to Fuel CR&R's Waste-hauling Trucks

LOS ANGELES – Jan. 31, 2017 – Southern California Gas Co. (SoCalGas) and waste management company CR&R

Environmental today announced they broke ground on construction of an eight-inch pipeline that will bring carbon-neutral renewable natural gas into the SoCalGas distribution system for the first time



SoCalGas

A  **Sempra Energy** utility[®]

NATURAL GAS LEAK DETECTION

We need to think bigger and employ all options for safe, resilient, reliable and affordable energy systems for the

Low- Carbon Future

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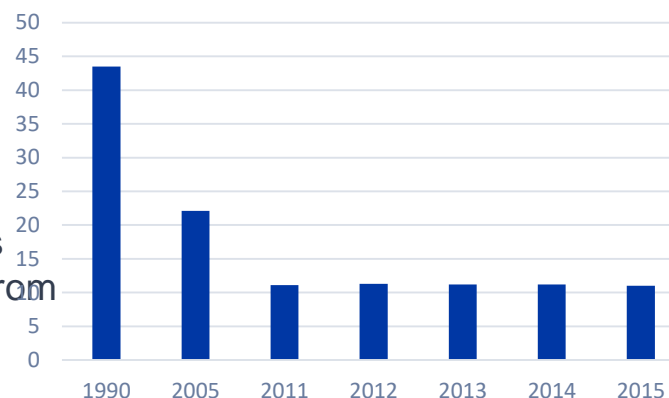
GTI R&D: Addressing Methane Emissions

- > Ron Edelstein, GTI
- > NARUC Gas Committee
- > November 2017

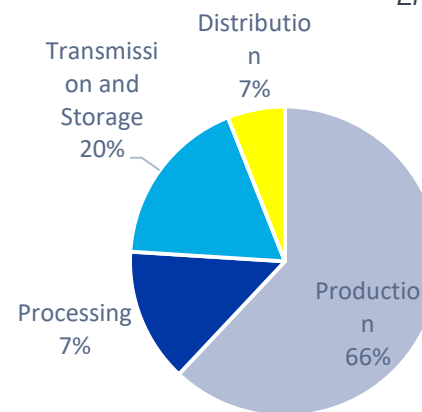
A Continued Focus on Methane Emissions

- > 2008: EPA Announces GHG Reporting Rule
- > 2009: GTI develops methane emissions white paper
- > 2010: GTI executes OTD projects to improve estimates for distribution sources
- > 2011: EDF launches comprehensive study on natural gas emissions with direct support from the industry
- > 2012: GTI develops revised Emission Factors for Plastic Pipe
- > 2013: GTI initiated project with CARB to quantify methane emissions from pipelines
- > 2014: GTI holds first CH₄ Connections Conference
- > 2015: GTI awarded project by CEC to Measure Methane Emissions from Commercial Buildings
- > 2016: GTI awarded project by DOE to Improve Characterization of Methane Emissions , CARB Phase 2 project awarded on Residential Meters

Methane Emissions from Distribution (MMt CO₂ Eq)



Source:
EPA



DOE Project: Classification of Methane Emissions from Industrial Meters, Vintage vs New Plastic Pipe, and Plastic-lined Steel and ~~Cast Iron Pipe~~

- > Improve characterization of specific emissions and reduce uncertainty associated with EPA GHGI through

field measurement study

Project Sponsors

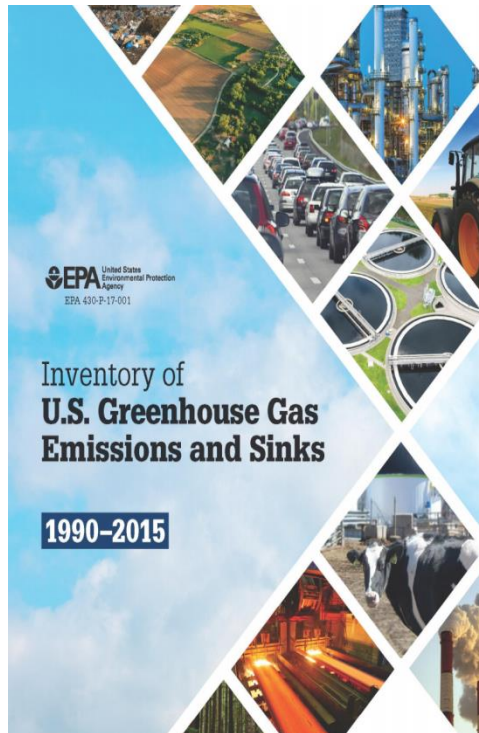
DOE, OTD, AGA, Canadian Energy Partnership for Environmental Innovation

Project Team

GTI, AECOM, GHD, Washington State University

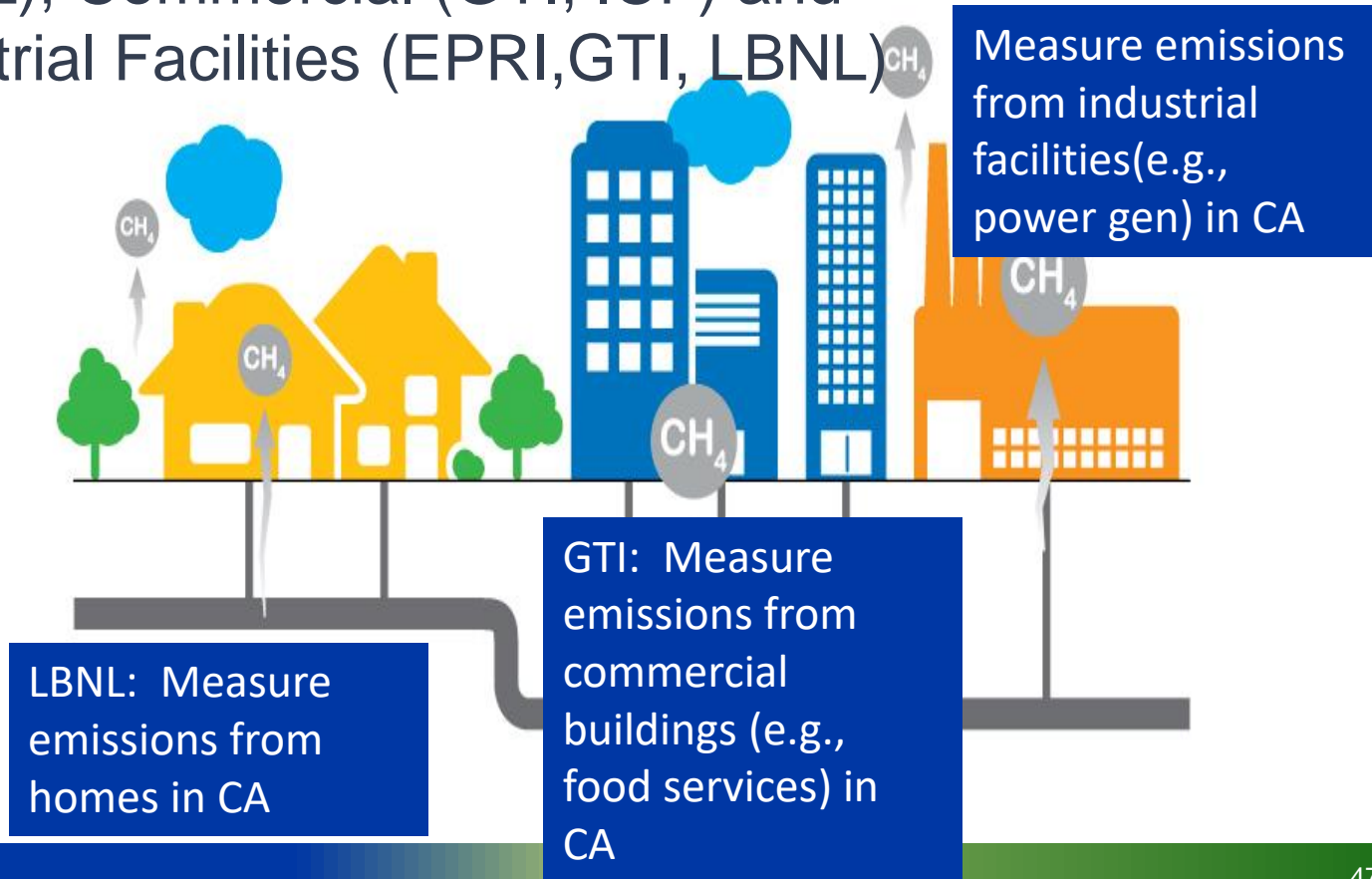
Project Status

Developed Field Measurement Methodology
Identified 13 Host Utilities (SoCal, PG&E, Xcel, Atmos, Duke, Piedmont, Vectren, Nisource, WGL, National Grid, ConEd, Centerpoint, ONG)
Field Measurement Campaign Ongoing
Conducted 6 weeks of Field Measurements
Expected to complete field measurements by Q2 2018



Moving Beyond the Meter

- > CEC Studies: Emissions from Residential (LBNL), Commercial (GTI, ICF) and Industrial Facilities (EPRI, GTI, LBNL)



Enhancing Safety Through Adoption of Residential Methane Detectors



- > RMDs are commercially available however there is low customer
- > Extensive laboratory testing of commercially available RMDs has been completed
- > National pilot study is currently being executed to collect performance data in

An opportunity to augment existing safety programs and add another layer of protection for the detection of leaks

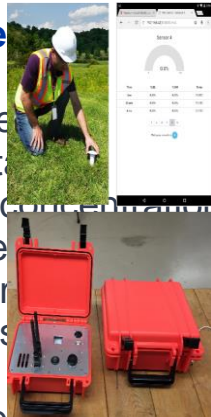
Accuracy and Reliability	Codes and Standards	Awareness and Education	Product Advancement
<ul style="list-style-type: none"> > Work collaboratively with manufacturers to ensure commercial products deliver safety enhancement expectations for the gas industry 	<ul style="list-style-type: none"> > Modify existing UL 1484 standard with emphasis on lower detection limit > Seek parallel path of certification through International Code Council 	<ul style="list-style-type: none"> > Continue stakeholder education and outreach and develop formal advocacy plans 	<ul style="list-style-type: none"> > Determine optimal placement of detectors based on U.S. building construction practices and typical ventilation effects

Methane Emissions Monitoring, Mitigation, and Insights

MULTIPLE OTHER EFFORTS UNDERWAY ON METHANE MONITORING, LEAK QUANTIFICATION, AND MITIGATION
SELECT EXAMPLES

Methane Monitoring Tools For Utilities and First Responders

Network of remote sensors connect wirelessly to provide full situational awareness via phone or tablet. Provides information about natural gas concentration at multiple points at a leak site. Initial field testing underway on two form factors: (1) First responder use case and (2) Utility measurement use case (semi-permanent longer-range wireless sensors for utilities to assess and monitor leaks over time).



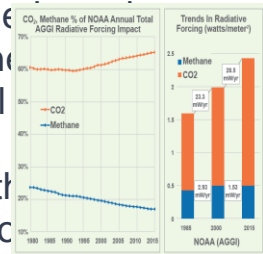
Field Tool for Improved Leak Measurement and Classification

Methane concentration does not tell the whole story. Utilities need a repeatable method to compare the leak rate to prioritize Class 2 & 3 leaks. Simultaneous measurement of CH₄ concentration, air temperature, and humidity for improved quantification of leak classification.



Center for Methane Research (CMR)

CMR is a collaborative program formed to serve as an objective industry resource to ensure that credible, state-of-the-art fact-based information on methane emissions is developed, accessible, and underpinned by stakeholder collaboration. CMR's goal is to provide the best available technical information on methane in the environment, including fit-for-purpose communication tools for various parties (e.g., scientific community, policy makers, NGOs, and others).



CH₄ Connections Conference

CH₄ Connections brings together industry experts and leaders to discuss and debate methane emissions from a host of perspectives. Speakers at CH₄ Connections address current research on methane leakage, technologies to detect and reduce emissions, policy and regulatory options, and business implications and opportunities.



Center for Methane Research

- > Industry collaborative program, currently consists of 18+ companies
- > Bring greater understanding on (1) methane emissions from gas operations and (2) long-term impact of methane in the atmosphere
- > Information resource for industry & public: conduct targeted research



	Global Warming Potential (GWP)		Global Temperature Potential (GTP)	
	GWP ₂₀	GWP ₁₀₀	GTP ₂₀	GTP ₁₀₀
Methane	84	28	67	4

Allen, M., "Short-Lived Promise? The Science and Policy of Cumulative and Short-Lived Climate Pollutants" (2015).



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