

DOCKETED

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Integrated Energy Policy Report (IEPR) Staff Workshop Fugitive Methane Emissions in California's Natural Gas System

June 1, 2015
California Energy Commission

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



Preview

- » Company Background
- » Methane Reduction & Technology
- » Being Part of the Solution



SoCalGas & SDG&E Service Territory



- Nation's largest natural gas distribution utility
- In business for 140+ years
- 12 counties, 500+ communities served
- 21.1 million customers
- 5.8 million gas meters
- 20,000+ square miles of service territory



Service Territory Stats

SOCALGAS AND SDG&E

Annual Deliveries

1 TRILLION CUBIC FEET

5%

of U.S. Deliveries

Four Storage Fields

136 BILLION CUBIC FEET

3%

of U.S. Storage Capacity

Transmission System

3,742

combined miles

3,508 SOCALGAS • 234 SDG&E

3.9 BILLION

CUBIC FEET/DAY

Receipt Capacity

13 COMPRESSOR STATIONS

205,662

Cumulative Horsepower

Distribution Network

57,930

miles of mains

49,953 SOCALGAS • 7,977 SDG&E

55,600

miles of services

49,010 SOCALGAS • 6,590 SDG&E

1,969

REGULATOR STATIONS

PRESSURES OF ~60 LBS/SQ INCH OR LESS

SoCalGas' Going Forward Plan



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



Investing in pipeline **safety enhancements**: ~\$1.5B over next five years including **Pipeline Information Management Systems (PIMS)**

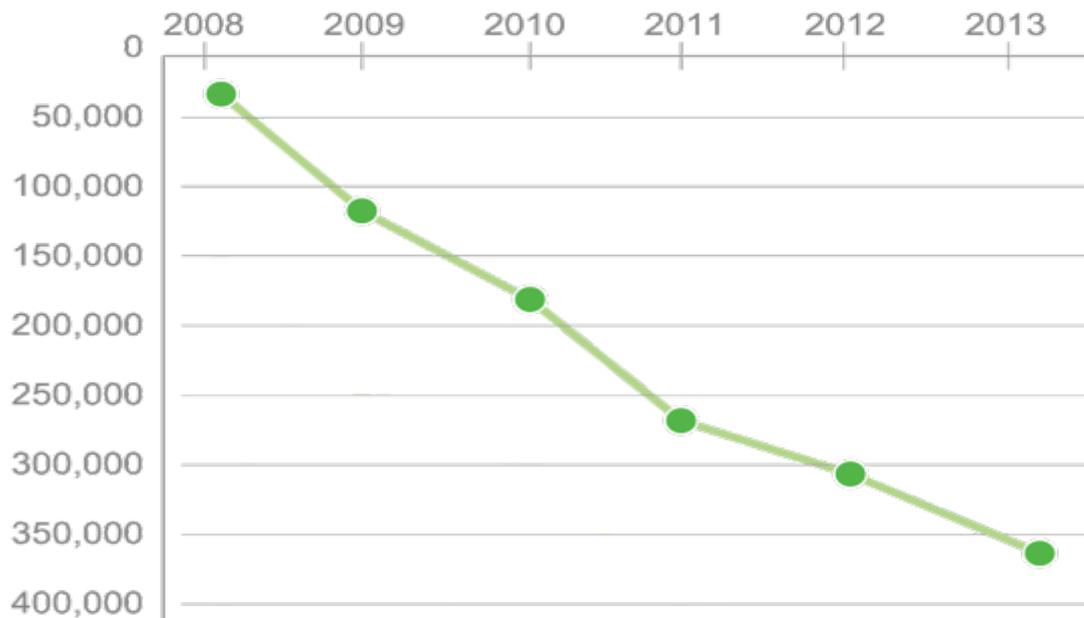


Proposed **accelerating replacement** of pipe and **eliminating non-hazardous leaks** backlog over 5 years in general rate case filing



Partnering with academia, regulators and industry on studies and programs: **Being Part of the Solution**

The result has been a steady decline in **SOCALGAS' EMISSIONS**



*Cumulative reduction from Best Management Practices (BMPs)
from EPA as reported under Natural Gas STAR Reductions*



JANUARY 2015 | SOUTHERN CALIFORNIA GAS COMPANY

A Sempra Energy utility

With the EPA Natural Gas STAR Program, SoCalGas achieved



360,366

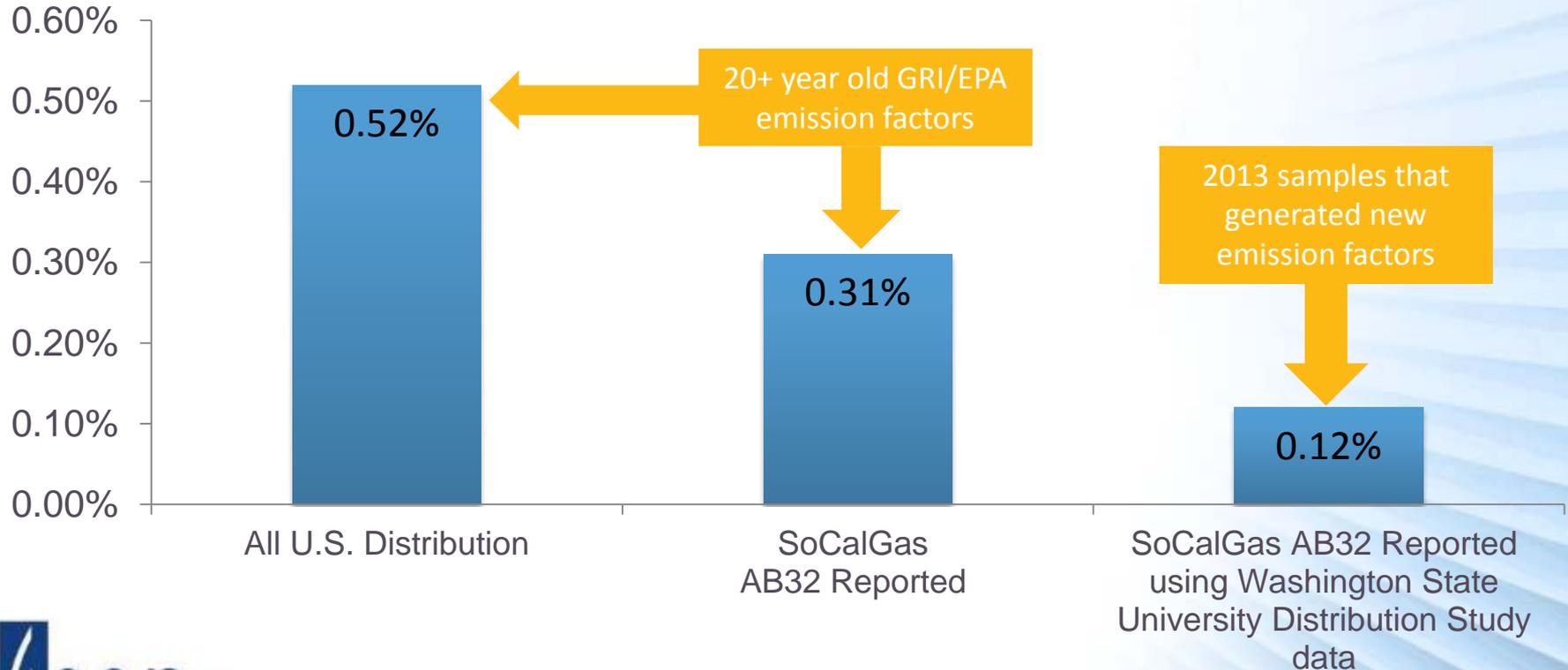
Methane Reductions
(MTCO₂e)

between 2008-2013

NEW STUDIES SHOW LOWER LEAK RATES

primarily due to system modernization and better leak detection

System Wide Emission Rate Comparison 2013 Reported/Delivered Volumes



SoCalGas has deployed technology innovations for **EVEN BETTER LEAK DETECTION**



MOBILE

New Mobile methane detection,
deployed in 2013



AERIAL SURVEYS

Future Technology: Unmanned aerial
vehicles (UAVs) to investigate emission
sources

Technology Plan Overview

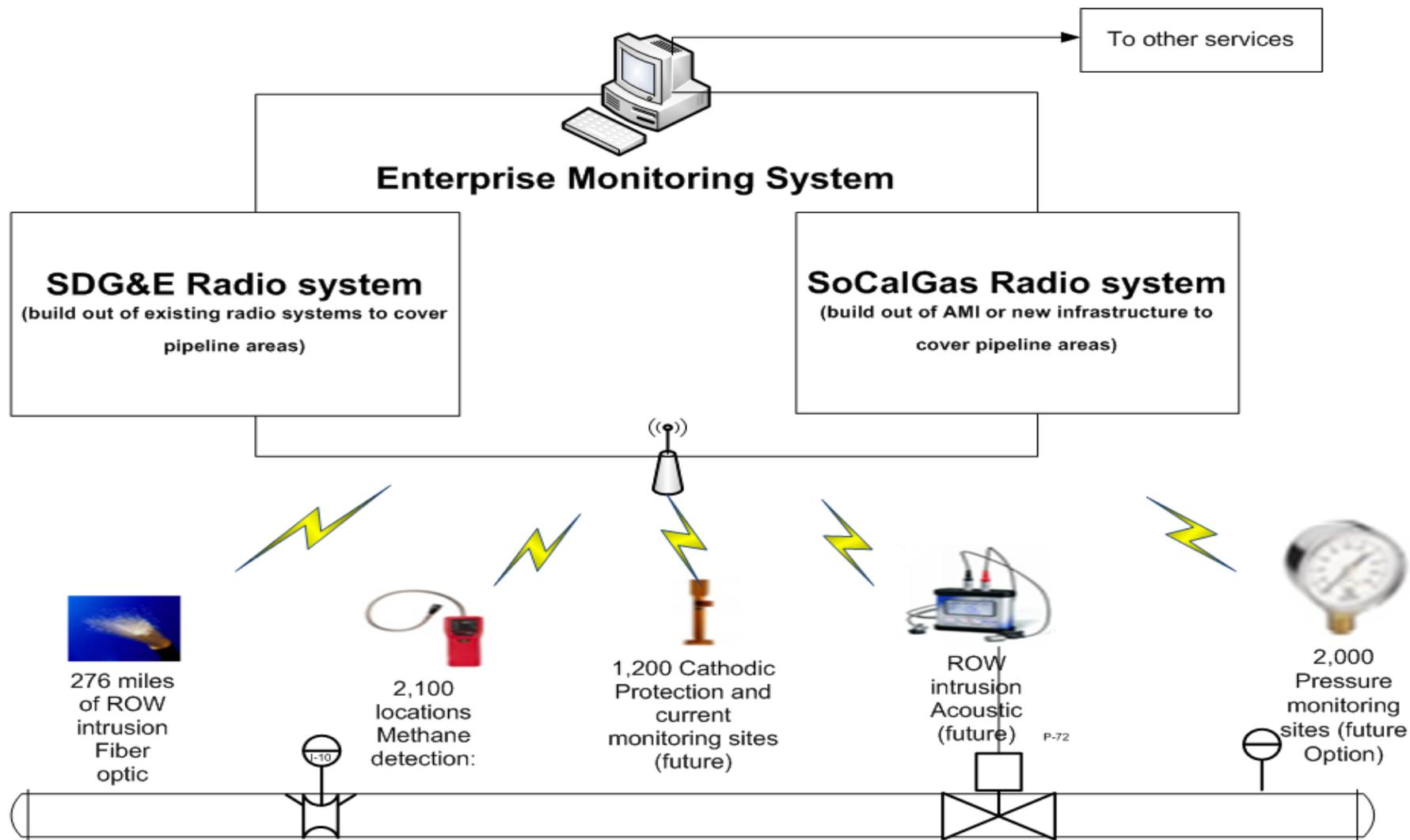
Purpose:

Provide near real-time field data on large pipeline rights-of-way to prevent, mitigate and manage pipeline incidents. (SDGE and SCG.)

Scope:

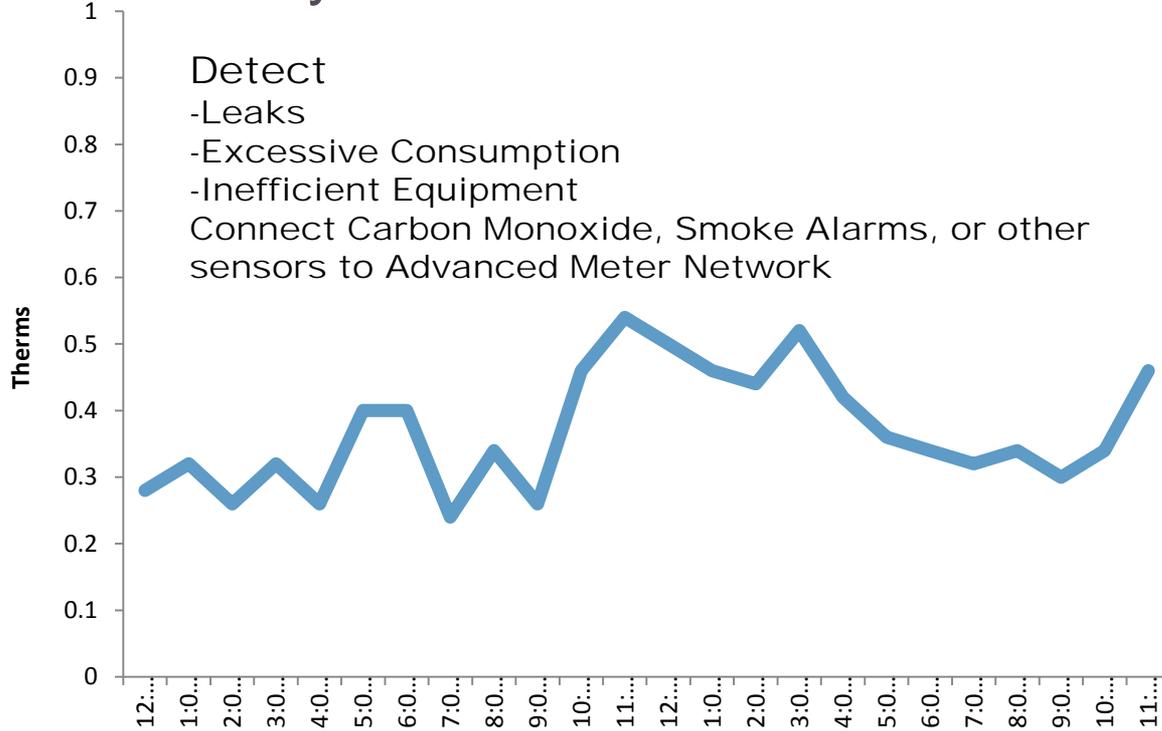
- 1. Methane detectors:** to provide real-time notification of major leaks
- 2. Fiber optic cabling along pipelines:** to provide event early warning on digging, movement, impact.
- 3. Pipeline Information Management System:** to collect information, manage data and to provide for linkage with dispatch and other company information systems
- 4. Radio system expansions**

OVERVIEW OF PIPELINE INFORMATION MANAGEMENT SYSTEM TECHNOLOGY



SMART GAS DRIVES EARLY DETECTION

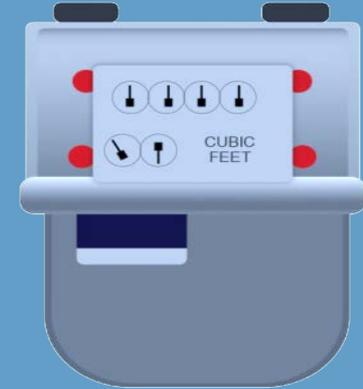
with hourly reads from advanced meters



Installation

2,503,768

MTUs Installed (9/19)

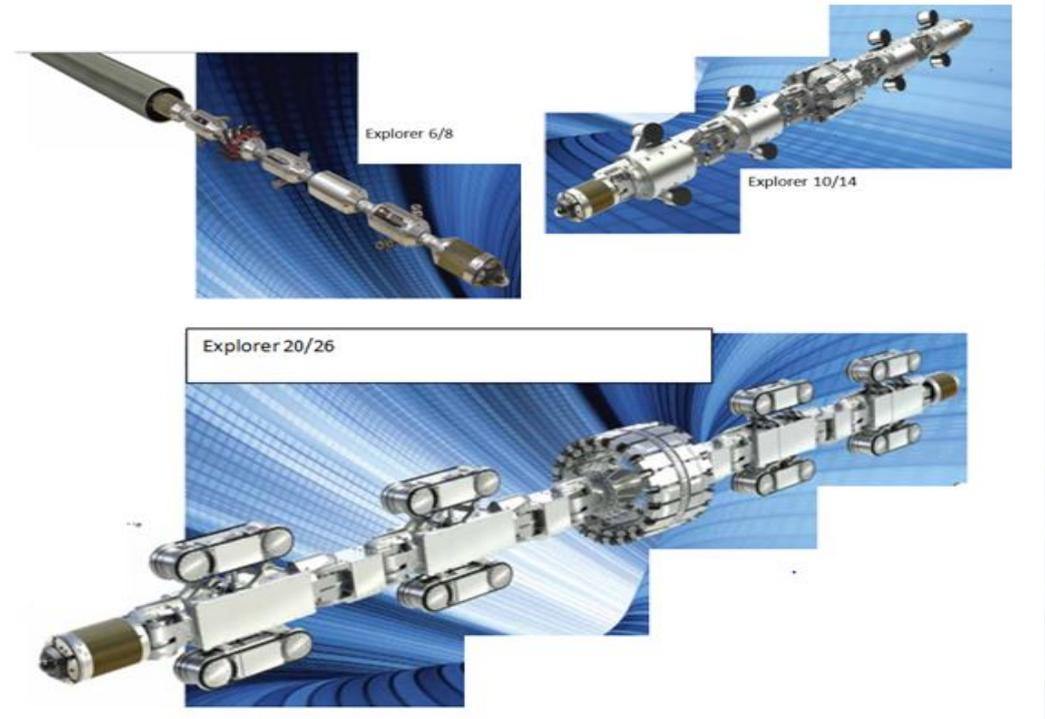


A Sempra Energy utility

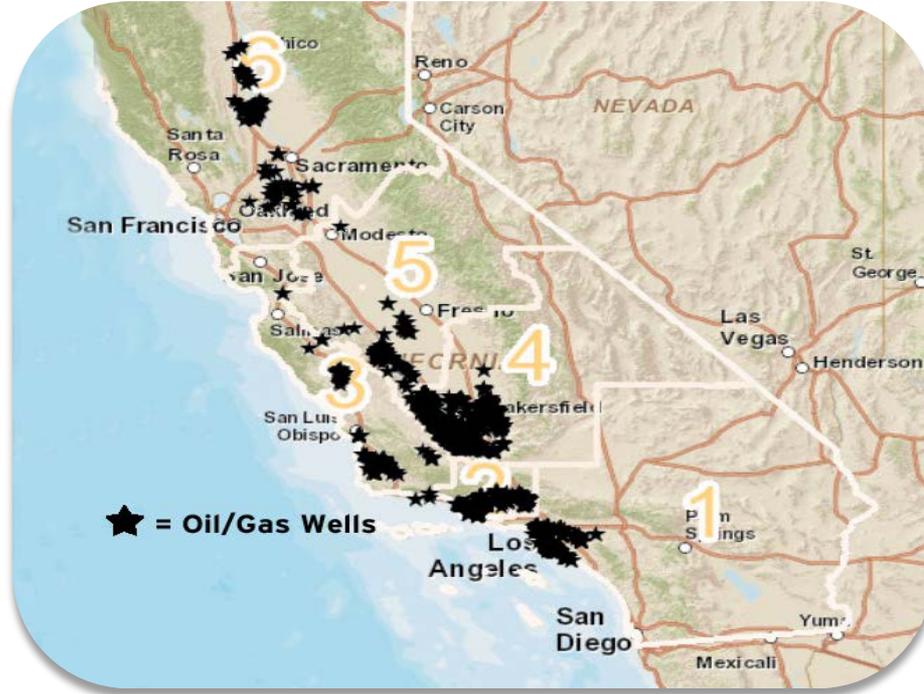
Innovation

Advancing Pipeline Safety Technology

- Self-propelled robotic internal inspection tool (smaller diameters)
- Remains In-Situ
- Rechargeable
- Continuous Monitoring
- Plastic & Metal Compatible



Gas Quality Monitoring Requirements Changing



- » New Sources are being added to system (i.e. biogas)-need affordable gas quality monitoring
- » Differentiating natural gas from system from other sources will be critical

Source: Division of Oil, Gas & Geothermal Resources Well Finder

WHAT WE HAVE LEARNED

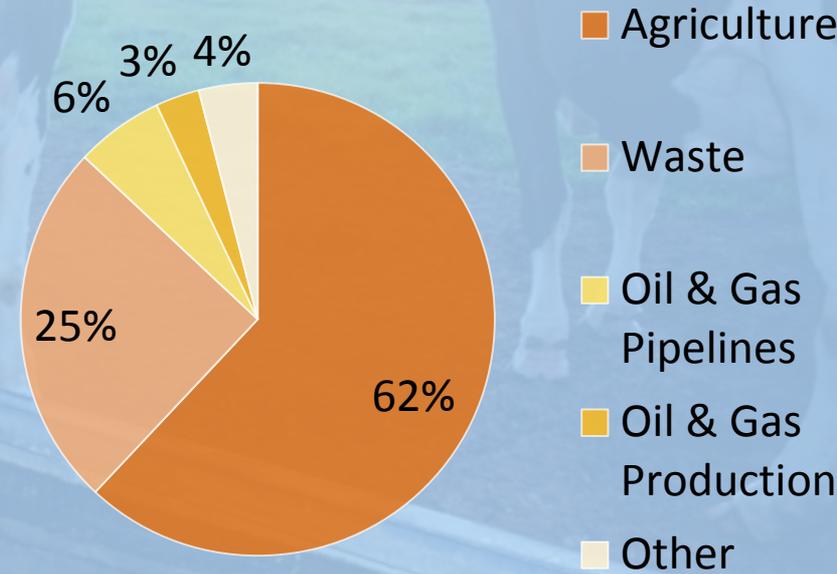
- » In the natural gas sector, **methane emissions are declining**, and will continue to decline.
- » Southern California Gas is looking to gain improvements through:
 - Infrastructure **modernization; eliminating backlog** and **accelerated pipe replacement** with California Public Utilities Commission approval;
 - **Continued partnerships** in methane emissions studies to identify areas to focus on and improve accuracy of inventory;
 - **Being part of the solution** with continued funding in Research, Development and Demonstration programs;
 - **Voluntary reductions** through EPA's Natural Gas STAR program.
- » **Science-based approaches must drive our policies** to invest our dollars wisely
- » **Direct Measurement Study** released by Washington State University supports accurate emissions inventories for developing effective and equitable methane control measures

Quick facts

DID YOU KNOW?



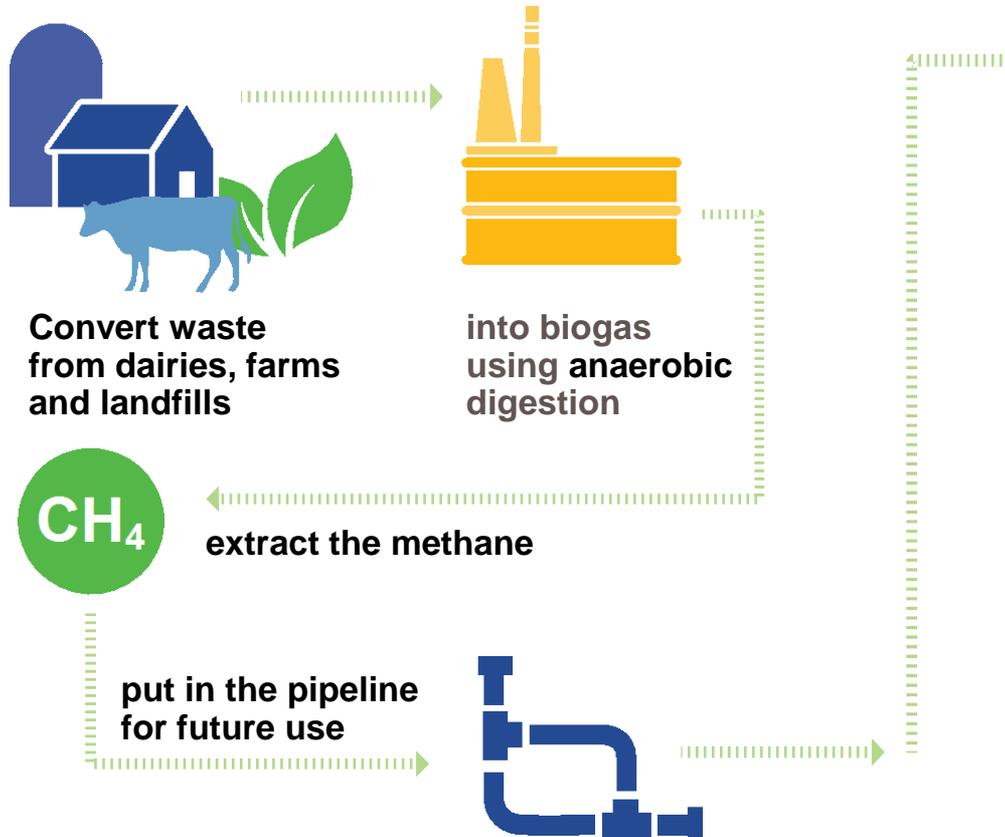
CA 2012 METHANE EMISSIONS*



*Source: California Air Resources Board (CARB) 2014 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

Exploring opportunities for further INNOVATION

PARTNERING WITH SCRIPPS
INSTITUTION OF OCEANOGRAPHY
AT UC SAN DIEGO

Algae **consume**
CO₂ and **NO_x**
emissions from
natural gas combustion and
convert it into biomethane



Natural gas system gives California
a practical way to store

RENEWABLE ENERGY



Learning from the EU's EXPERIENCE

Power-to-Gas

FALKENHAGEN, GERMANY

August 2013: First plant to convert electricity into H₂ and inject into the gas grid

STUTTGART, GERMANY

Plant uses an electrolyzer to produce H₂ from water. Combines with CO₂ from a biogas plant to produce CH₄



New innovations with hydrogen FUEL CELLS

REVOLUTIONIZING HOW
WE FUEL OUR CARS AND
POWER OUR HOMES

40% fewer GHGs than
gasoline when hydrogen is
produced from natural gas

NO GHGs
when produced from
renewable natural gas



Exploring opportunities for further INNOVATION

PARTNERING WITH THE NATIONAL
FUEL CELL RESEARCH CENTER AT
UC, IRVINE

18-month project to
investigate and test
the hydrogen blending
necessary for
commercial
Power-to-Gas storage of
excess wind & solar energy



Limit technology and you limit the possibility.

**We need to think bigger and find
solutions across the entire
ENERGY SYSTEM**

What questions
do you have?

