

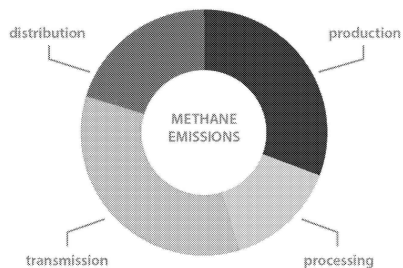
# ONE<sup>®</sup>

OUR NATION'S ENERGY

# FUTURE

## OUR VISION

Enhance the energy delivery efficiency of the natural gas supply chain by limiting energy waste and by achieving a methane "leak/loss rate" of no more than one percent.



## 4 Key Takeaways from Recent Emission Studies

### 1. Emission Levels

- Measurements at the source ("bottoms-up") indicate emissions are close to EPA's estimates.
- Measurements using aircraft ("top-down") indicate emissions are higher than EPA's estimates.

### 2. Regional Variations

- There are significant regional variations among emission sources.
- Differences likely attributable to (i) type of natural gas production (i.e. wet gas- vs-dry gas) and (ii) the age, number and type of infrastructure.

### 3. Fat-Tail Phenomenon

- A relatively small number of emission sources are responsible for a disproportionately large number of emissions.
- This "fat-tail" or "super-emitter" phenomenon exists in the production, gathering, transmission and distribution segments.

### 4. Cost-Effective Reduction Opportunities

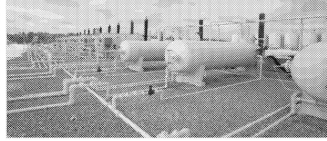
- There are a number of cost-effective emission control technologies that can be employed today.
- Advancements in emissions monitoring technologies are needed.



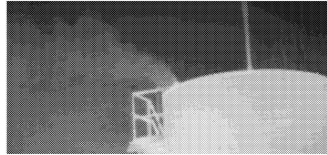


## Characteristics of Emission Sources

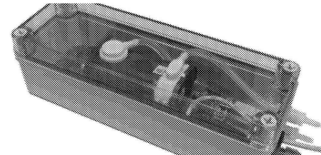
Large number of discrete emission sources



Majority of methane emissions are from a small number of sources (i.e. super-emitters/fat-tails)



Emissions monitoring technologies are still evolving

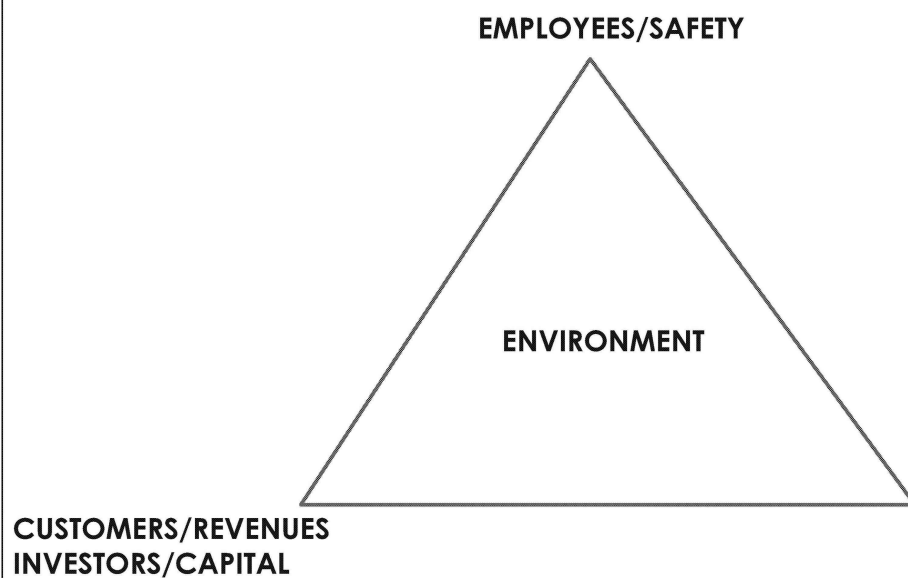


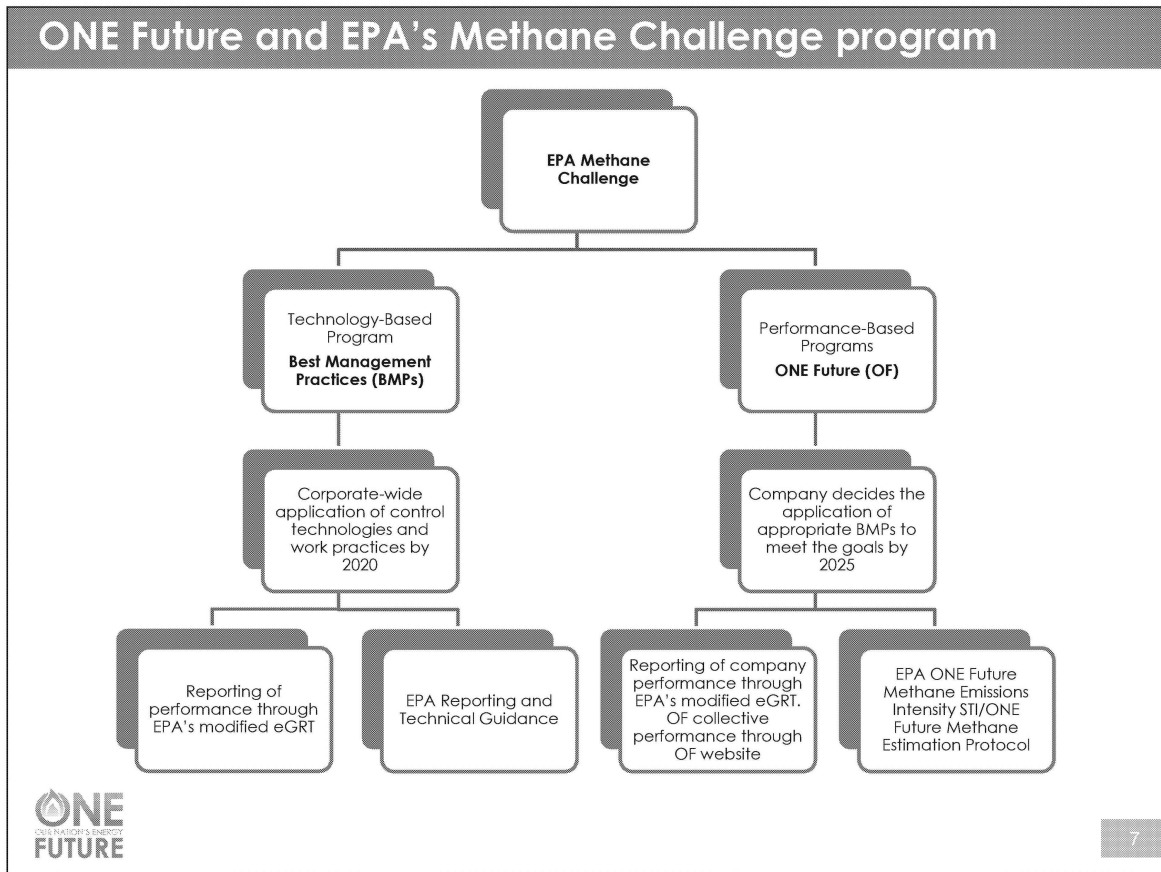
Emission reduction framework must address these emission characteristics



# **Redacted - First Amendment**

## ROLE OF METHANE REDUCTIONS IN BUSINESS DECISIONS





The Methane Challenge Program is an integral part of the EPA's – and the Administration's -- ongoing commitment to address methane emissions and global climate change.

In January 2015, the Obama Administration further announced a goal to cut methane emissions from the oil and natural gas sector by 40-45 percent from 2012 levels by 2025. Using the EPA's Greenhouse Gas Inventory, it is relatively straightforward to calculate that a reduction goal of 40-45% equates to emission reductions equivalent to between 77 and 86 million metric tons of carbon dioxide by 2025.

If we are successful in achieving an overarching methane emission intensity rate of 1 percent or less, we will accomplish roughly half of that goal via our voluntary initiative.

We also know that the public isn't necessarily going to take our word for it. That's why we have partnered with the EPA to, in essence, "show our work" and transparently demonstrate our progress toward the goal.

We have agreed to report emissions from across all of our US operations, far in excess of what is required by regulation, so that the public will be able to track our progress and benchmark our performance. That's all part of the ONE Future commitment.

## ONE Future Framework

### Goal: 99% efficiency rate across the value chain

#### + Starts with an ambitious goal.

- An average annual rate of methane emissions across our collective operations equivalent to one percent or less of US natural gas production.

#### + Goal will be met via performance-based deployment of technology & practices.

- "Technology agnostic" to meet the end-goal
- Will apply the same BMPs/TGDs from the EPA Methane Challenge BMP or CCAC TGDs...but individual companies are best situated to determine how they can most cost-effectively achieve their emissions reduction goal.

#### + Ensures transparency & credibility of results.

- ONE Future is a recognized partner of EPA's Methane Challenge program.



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By 2025, ONE Future companies aim to achieve an average annual rate of methane emissions across their collective operations that is equivalent to one percent or less of US natural gas production. This commitment covers the entire supply chain-wide, from wellhead to burner-tip.

Peer reviewed analysis indicates that natural gas provides GHG reduction benefits vs. any other fossil fuel with leak/loss rates of one percent or less across the natural gas value chain.

ONE Future has developed a Methane Emissions Estimation Protocol that relies largely on existing EPA estimation and reporting mechanisms

Streamlined and consistent reporting processes ensures minimizes the need for additional reporting and internal processes

ONE Future is a recognized partner of EPA's Methane Challenge program, and our progress will be transparently documented by EPA on their Methane Challenge website.

## Why Address Methane Emissions through ONE Future?

- + **Natural gas = Our Nation's Energy Future**
  - Build a sustainable future for natural gas
- + **Value-chain response**
  - Producer->Processor->Pipeline->Distribution
  - Constraint in one sector has impact on all
- + **Methane is our product**
  - Focus on efficiency
- + **Responsive to our shareholders and customers**
- + **Performance-based approaches like ONE Future follows latest science and achieves reductions at the lowest cost**
  - Each company optimizes emission reductions by focusing capital deployment on its own highest emitting sources
  - Technology-neutral approach encourages development of the most cost-effective solutions to achieve emission reduction goals, including new technologies
  - Existing or newly developed technologies can be applied at the discretion of the company to match its emissions profile
- + **Advocate sound policies that optimizes environmental goals with business goals**
  - Efficient allocation of resources and capital
  - All ONE Future companies are operators that are facing the same constraints
  - The rational middle pursuing science-based solutions



## Why Address Methane Emissions through ONE Future? (Cont'd)

- + **Forum for best practice sharing**
  - + Support from Technical Consultants and Peer companies
- + **Performance-based program can be developed for any geographical area or any sector**
  - Goals established in ONE Future as a ratio (percentage) of emissions relative to natural gas throughput
  - Goals can also be expressed as a ratio of emissions relative to unit production (e.g. kg CH<sub>4</sub>/Tbtu or kg CH<sub>4</sub>/TJ) OR
  - Percentage of reductions from a baseline (e.g. ONE Future aims to achieve a 45% reduction in methane emissions intensity from 2012 levels by achieving a 1% target by 2025)
  - Baseline data not required for goal-oriented programs such as ONE Future or if standards are set at a ratio of emissions relative to unit of production
- + **Intensity-based metrics enable bench-marking between companies, regardless of size**
  - Does not penalize large companies or companies that have instituted prior reduction programs



## The One Percent target

**Emission goals for each industry segment achieve an aggregate 1% emissions intensity by 2025.** *(Expressed as a percentage of total natural gas production.)*

- + Segment targets are based on the availability of abatement opportunities in each industry segment.

Industry Segment	2012	2020	2025
Production	0.56%	0.46%	0.36%
Gathering & Processing	0.19%	0.15%	0.11%
Transmission & Storage	0.44%	0.37%	0.31%
Distribution	0.26%	0.24%	0.22%
Total Upstream	1.45%	1.22%	1.0%





## Alternative Performance-based Metrics

Segment	2012		2025	
	kg CH <sub>4</sub> /Tbtu	kg CH/TJ	kg CH <sub>4</sub> /Tbtu	kg CH/TJ
Production	71.9	68.2	46.9	44.4
Processing	49.8	47.2	29.4	27.8
Transmission	79.5	75.3	54.5	51.7
Distribution	90.5	85.8	78.0	73.9

An E&P company could set its goals to meet these standards

The above metrics are “equivalent” to the ONE Future Intensity Goals



