ONE Future – DOE LCA

Phase 1 Recommendations and Phase 2 Goals

ONE Future Methane Initiative and Climate Workshop - May 22, 2019

NATIONAL ENERGY TECHNOLOGY LABORATORY

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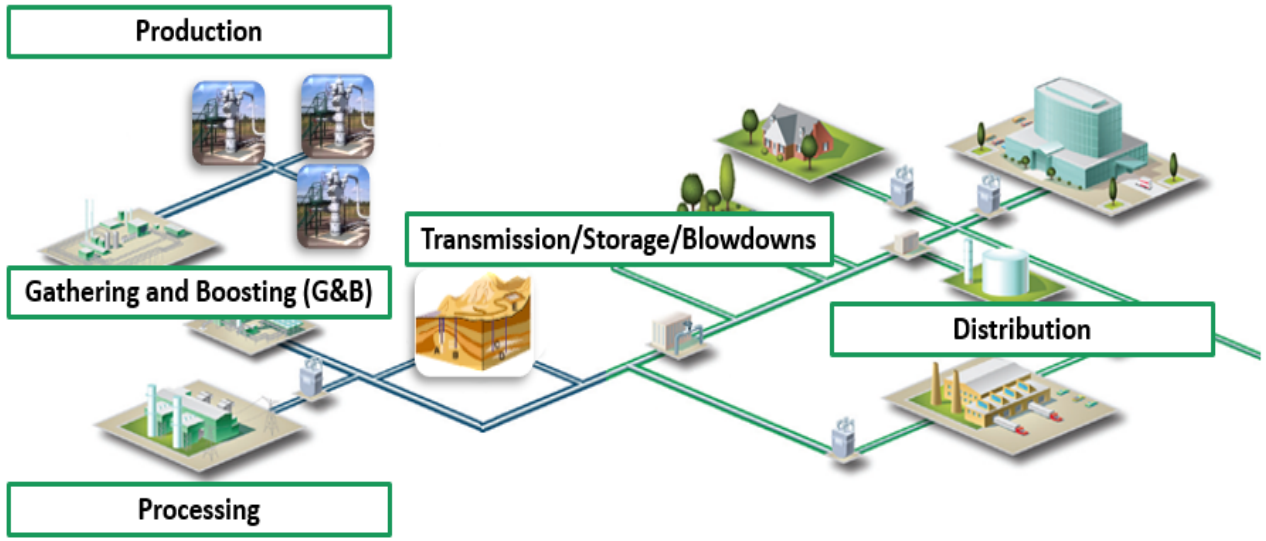
Collaboration Between DOE and Industry

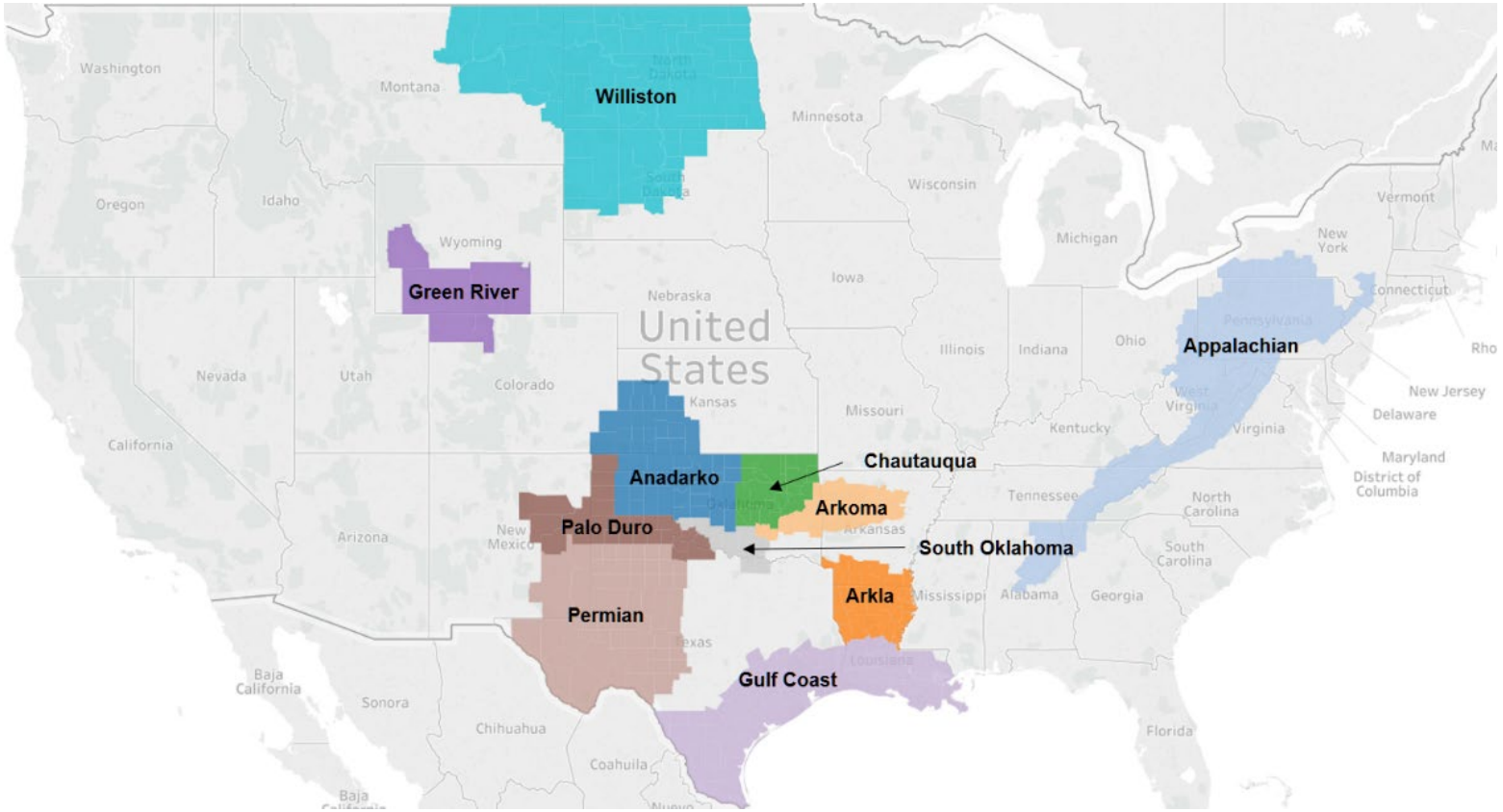
- **NETL** supports DOE's mission to advance U.S. energy security and conducts a broad spectrum of research and development programs
- **ONE Future** is a group of leading natural gas companies focused on reducing methane (CH_4) emissions across the supply chain
- **Study objective:** Characterize ONE Future's supply chain greenhouse gas (GHG) emissions and evaluate opportunities for improvement



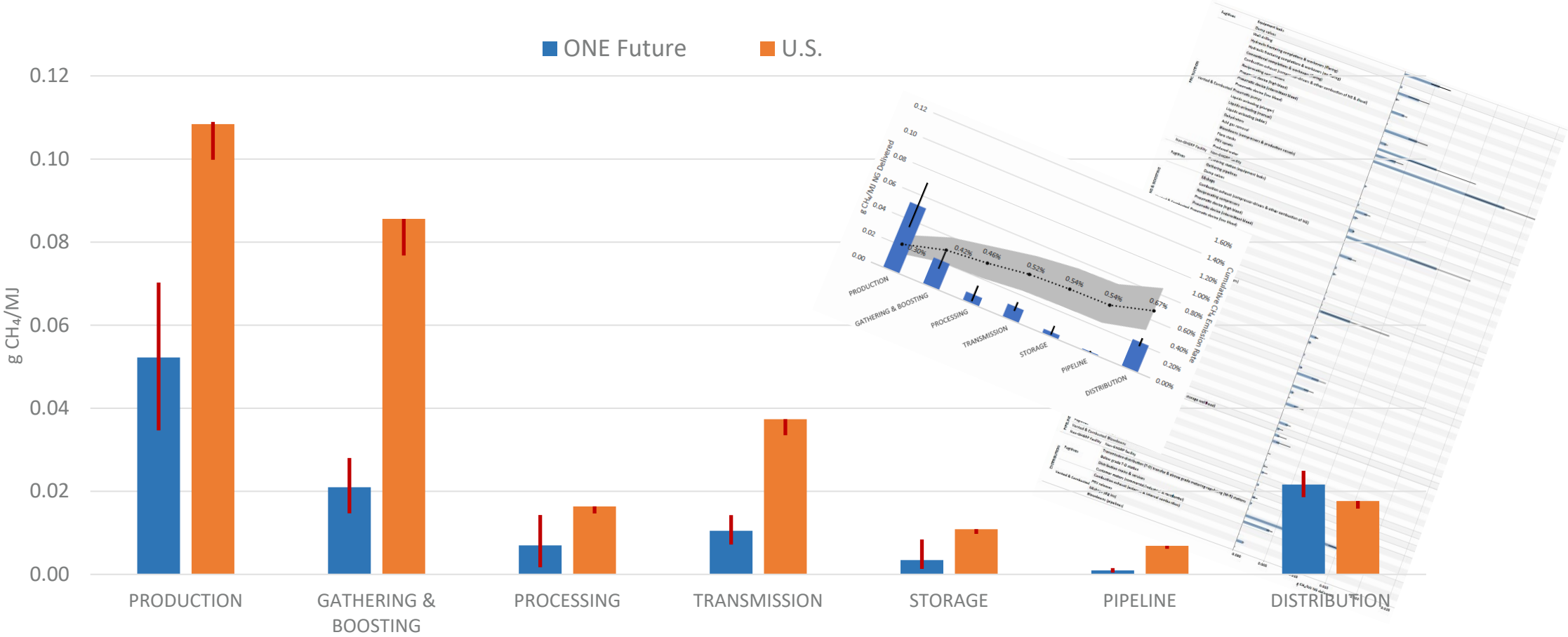
Phase 1 Data Representativeness

Annual operations with broad geographical and technological representativeness

- Data were collected using ONE Future's ongoing GHGRP activities
- 2016 operations
- 11 production basins
- 5% to 12% of U.S. supply chain capacity (depending on stage)

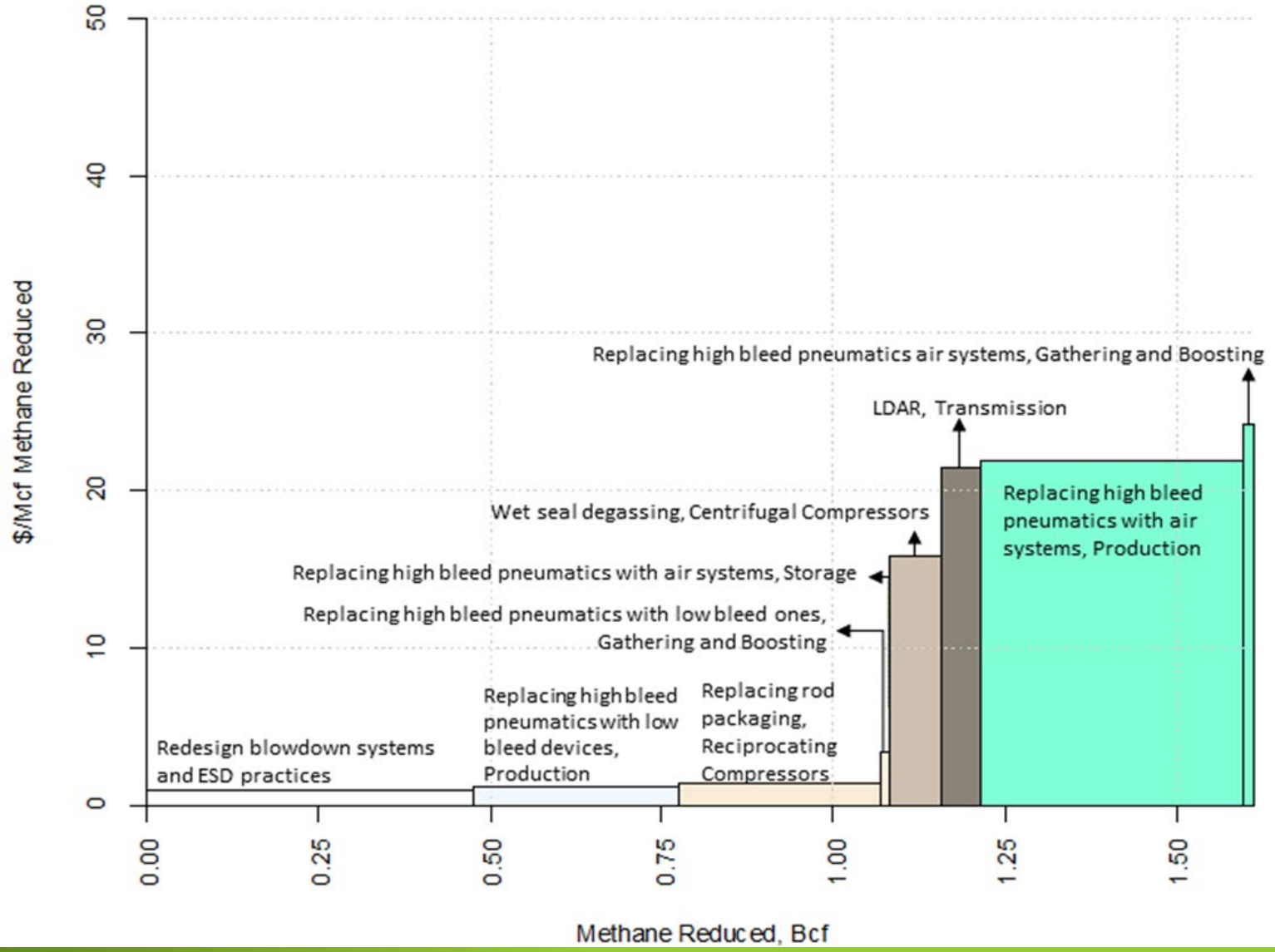


Phase 1 Results (LCA)



- ONE Future's life cycle methane emission rate is 0.7%, but underlying data are highly variable
- Compressor systems, episodic events, and distribution pipes are key emission contributors

Phase 1 Results (MAC)



- 1.1 Bcf of low cost mitigation options
- Top mitigation options for ONE Future are different than for other operators in the natural gas supply chain

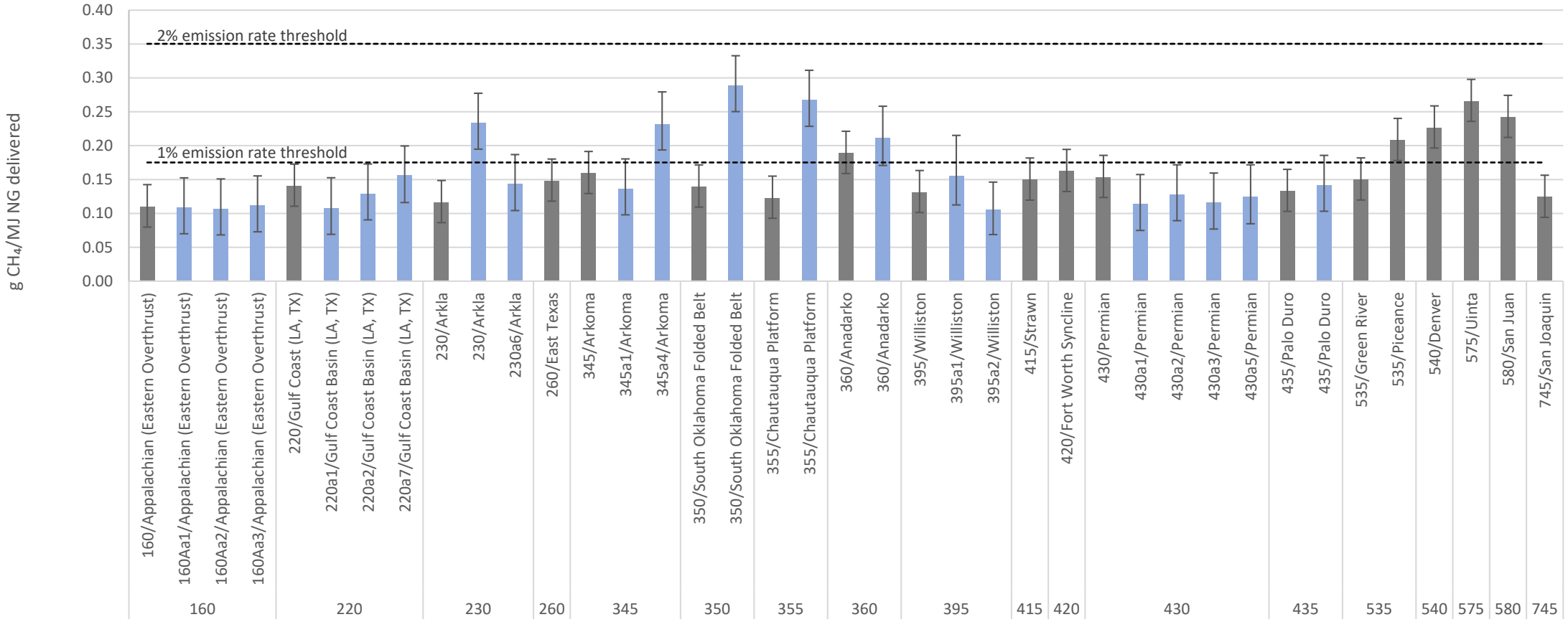
Phase 1 Recommendations

- **Compressors**
  An efficiency and emissions improvement opportunity for all stages
- **Episodic emissions**
  A source of variability that drives study uncertainty
- **Distribution pipe**
  An example of a known emission source in need of cost-effective solutions
- **Value of different analytical perspectives**
  LCA, cost, and inventory analyses can be used in concert for prioritization of CH_4 emission reduction opportunities

Phase 2 Study Purpose & Goal

- Determination of how ONE Future member companies reduced their methane emission rates below the national average
- Life cycle analysis (LCA) with regionalized production, gathering and boosting, processing, storage, and distribution scenarios representative of ONE Future members for 2017 operations
- Marginal abatement cost (MAC) analysis with regional cost curves enhanced and improved cost data

The Case for Regionalization



- Understanding drivers of variability points us toward improvement opportunities
- Inter- vs. intra-basin variability could allow delineation of natural vs. engineered phenomena

ONE Future's Mitigation Questionnaire

- ONE Future members are compiling successful strategies and practices via an internal questionnaire
- Information from this questionnaire will be provided to NETL
- It will help explain *how* ONE Future has reduced emissions

Phase 2 Proposed Project Timeline

Data collection is the most significant time commitment from ONE Future members

Project Phase	Months
Amended MOU	March 2019
Project Kickoff	April 2019
Data Collection *GHGRP 2017* *Below-GHGRP-threshold data* *Additional component and cost data for MAC* *Questionnaire**	April 2019 - June 2019
Data Validation	June 2019 - July 2019
Analysis and Draft Report	October 2019
Final Report (after joint reviews)	January 2020

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