



# Realistic Completion Emissions

Stakeholder Workshop on Natural Gas in the Inventory  
of U.S. Greenhouse Gas Emissions and Sinks

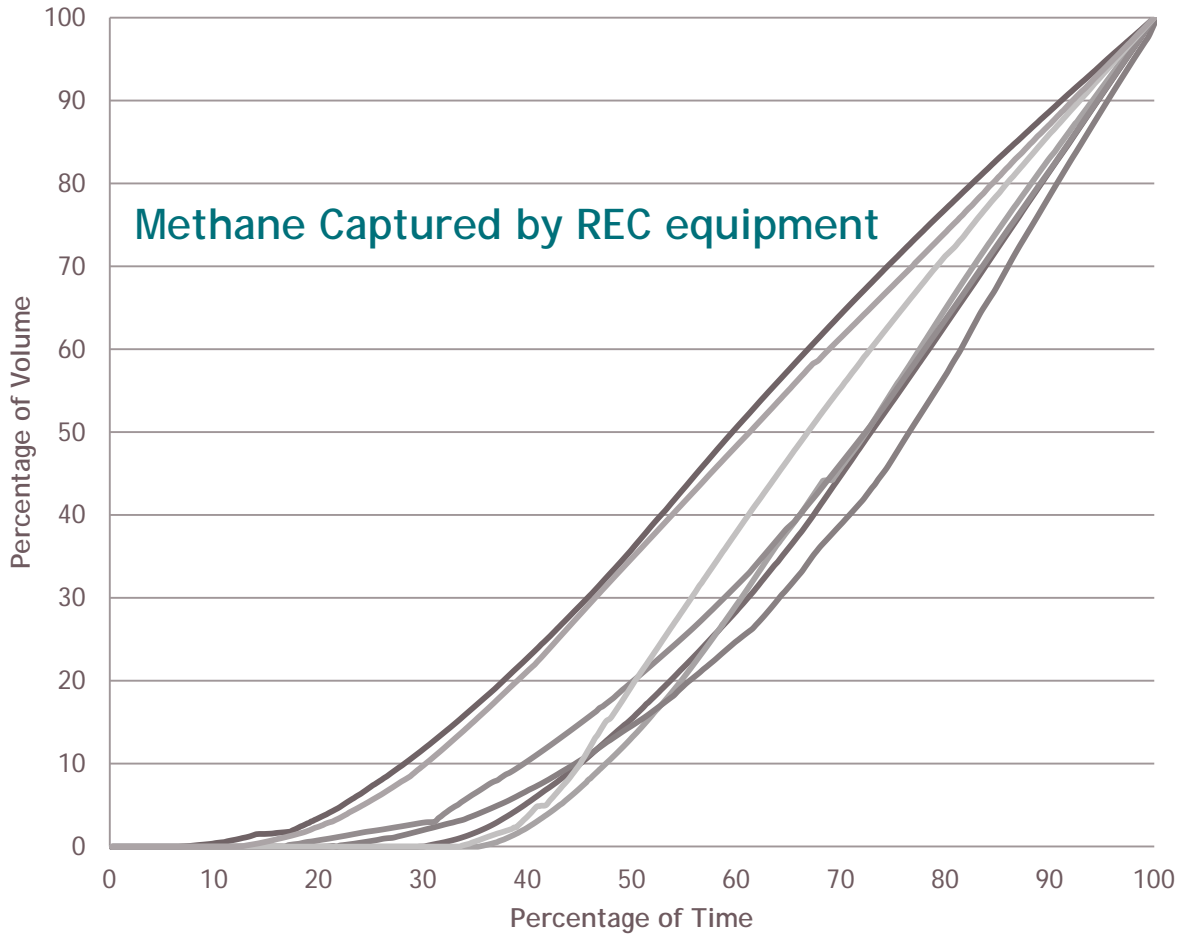
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# Preface

- EPA's estimates that 9.175 MMCF of natural gas is released per well completion<sup>1</sup>
- These estimates are based on Natural Gas Star data, which measured gas captured by REC equipment during flowback
- Flowback with REC equipment is typically 8 to 12 days
- Without this equipment, industry averages 3.5 days of flowback<sup>2</sup>
- Wells typically increase methane production during flowback over time
- EPA therefore significantly overestimates methane releases from completion activities<sup>3</sup>

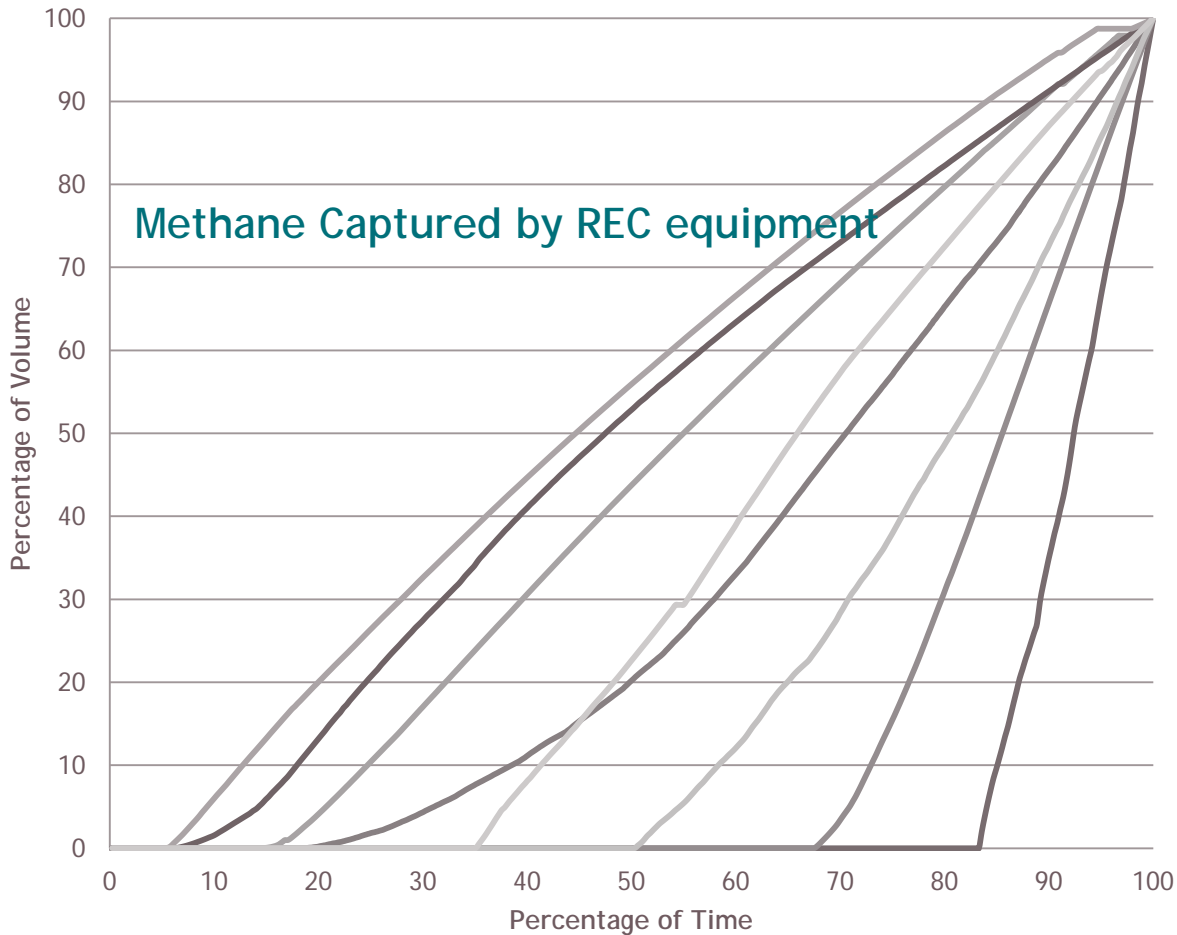
# Area 1 - Cotton Valley



Well	MMscf		
	3.5 Day	10 Day	Gas Star Reported
No. 1	0	7.9	120.8
No. 2	0.0	0	160
No. 3	0.2	16.5	48
No. 4	1.4	22.1	99.3
No. 5	0.7	20.5	53.0
No. 6	0.0	5.7	63.8
No. 7	0.7	29.3	118.7
<b>Avg*</b>	<b>0.3</b>	<b>14.5</b>	<b>91.1</b>

\*Average does not contain highest and lowest numbers of each set

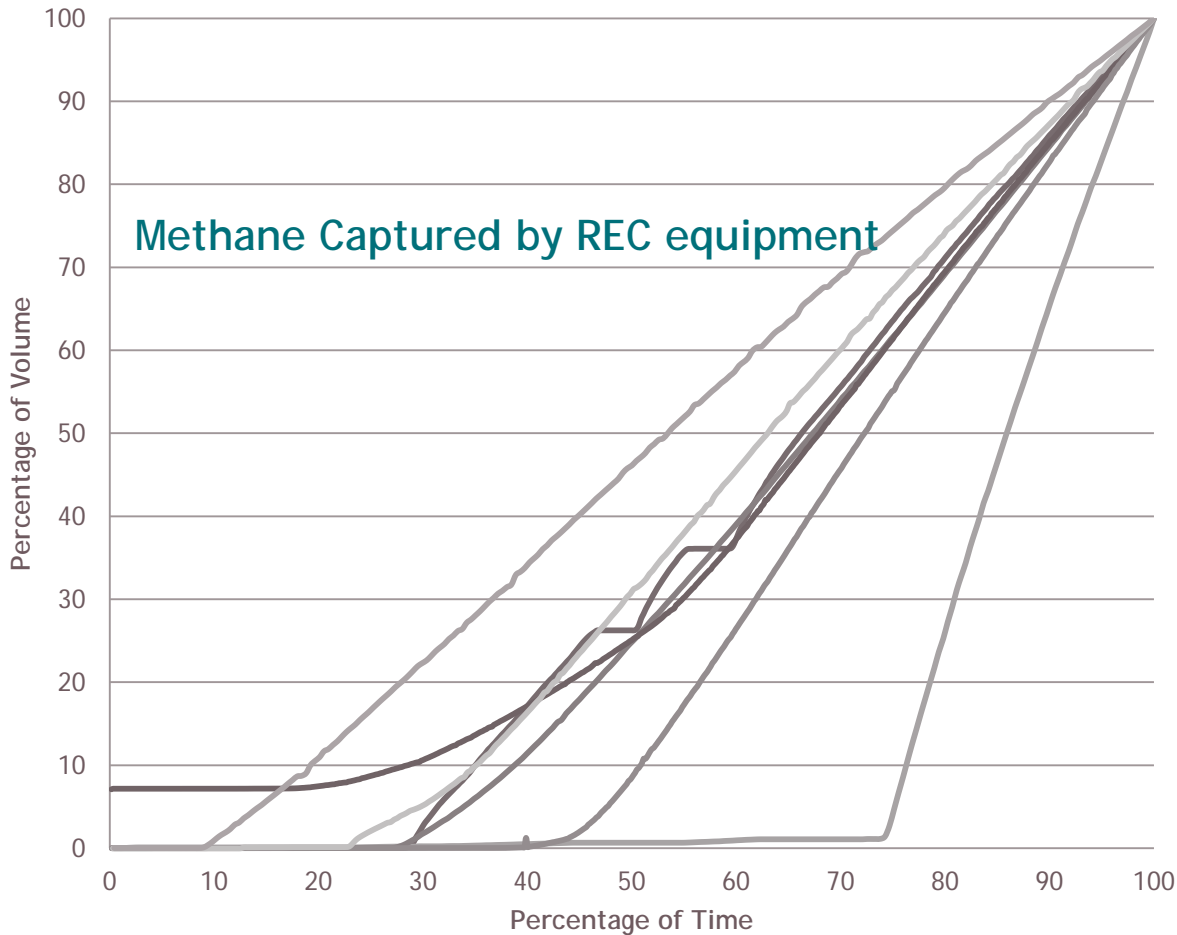
# Area 2 - Western Oklahoma



Well	MMscf		
	3.5 Day	10 Day	Gas Star Reported
No. 1	0.0	0.0	0.9
No. 2	0.0	28.1	119.8
No. 3	0.0	2.1	40.8
No. 4	6.8	24.5	32.9
No. 5	0.0	0.0	27.8
No. 6	0.0	1.9	6.2
No. 7	17.8	56.7	90.9
No. 8	0.0	17.2	44.9
Avg*	3.1	16.3	45.5

\*Average does not contain highest and lowest numbers of each set

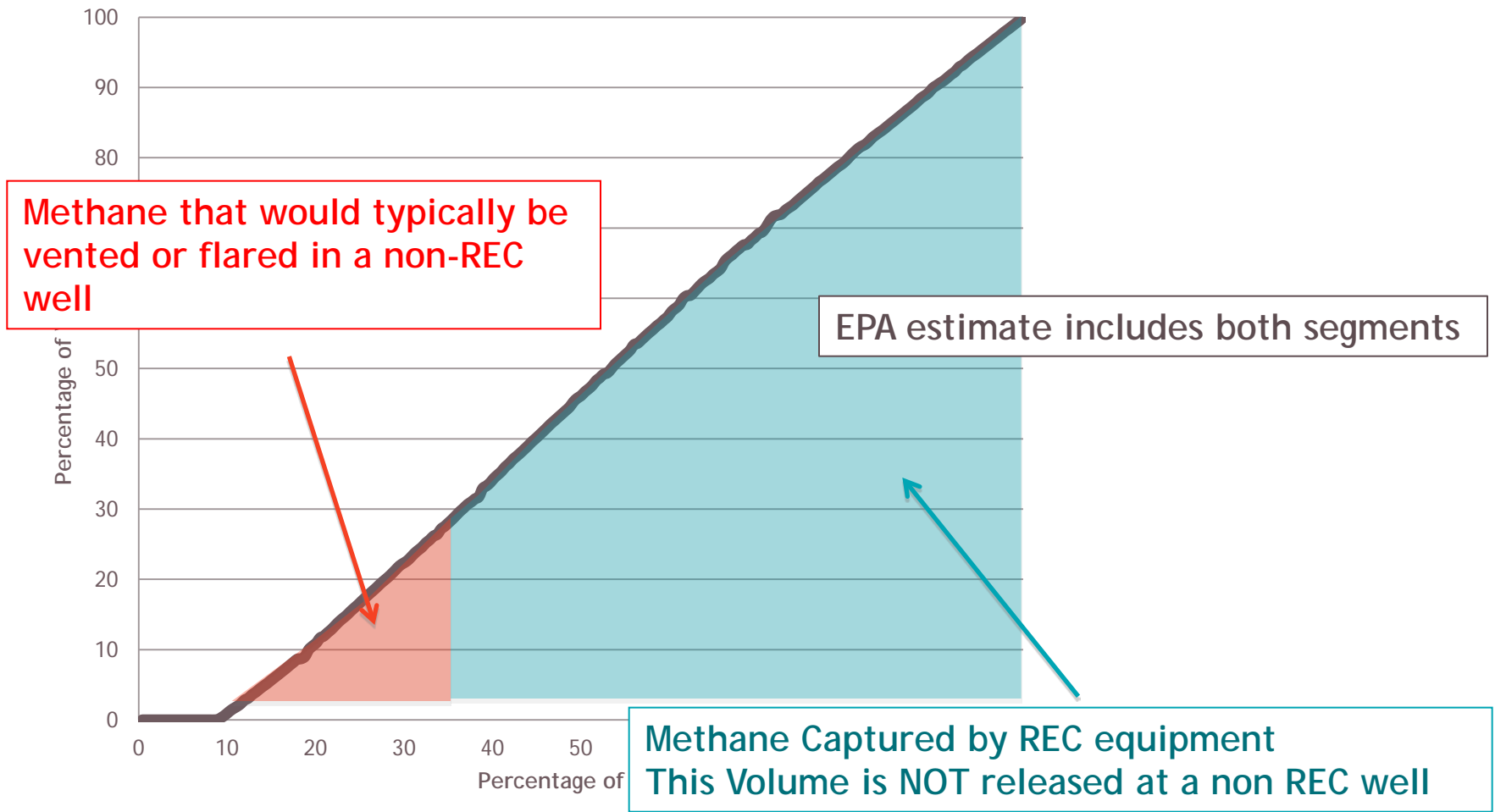
# Area 3 - Barnett Shale



Well	MMscf		
	3.5 Day	10 Day	Gas Star Reported
No. 1	0.0	6.9	21.0
No. 2	0.0	5.3	5.3
No. 3	1.8	0.0	28.1
No. 4	4.3	8.1	59.5
No. 5	0.0	38.5	38.5
No. 6	0.6	14.3	22.0
No. 7	4.9	16.8	16.8
Avg*	1.6	11.4	27.3

\*Average does not contain highest and lowest numbers of each set

# Data mock-up



# Thank you!

## Questions?

Thank You.



# References

1. EPA Greenhouse gas emission inventory sources and sinks, 2011 - <http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2012-Annex-3-Additional-Source-or-Sink-Categories.pdf2>.
2. URS Study, Commissioned by Devon Energy - <http://anga.us/media/241555/anga-axpc%20nsp%20memo%20revised.pdf>
3. See also the API/ANGA Report for additional data and evidence - not yet released