

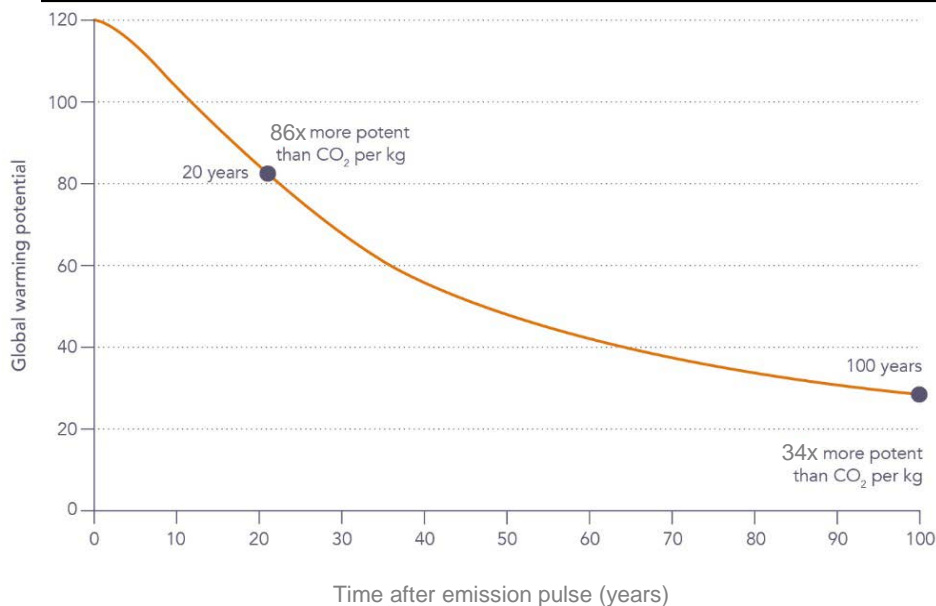
Methane Emissions from the Natural Gas Supply Chain

UNECE Group of Experts on Gas
Geneva
March 2017

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1. BACKGROUND

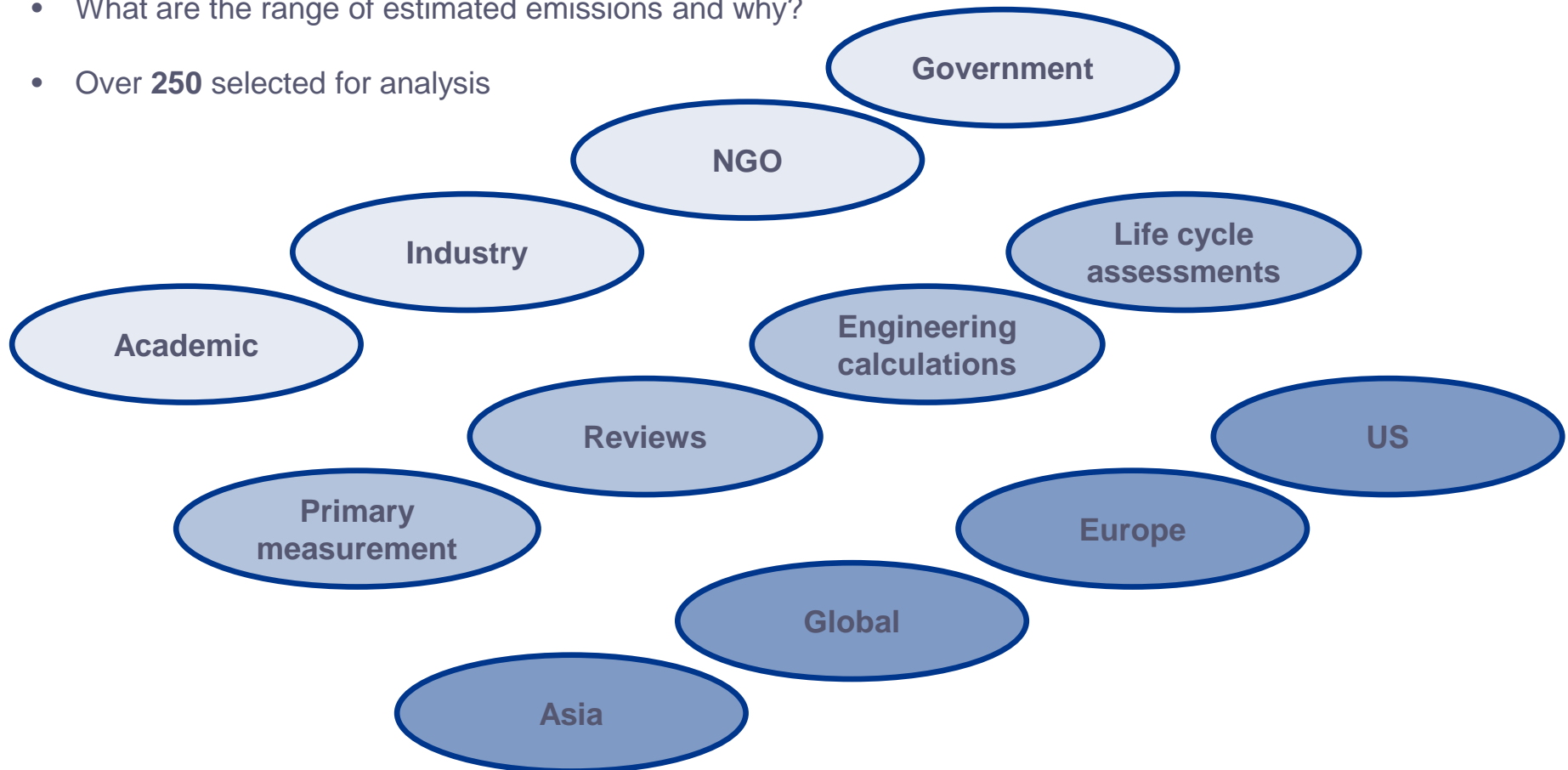
Metric	Methane	CO ₂
Atmospheric lifespan	12 years	100,000s years
Instantaneous climate forcing	120	1
Global Warming Potential (20 years)	86	1
Global Warming Potential (100 years)	34	1
Global Temperature Change Potential (20 years)	67	1
Global Temperature Change Potential (100 years)	4	1



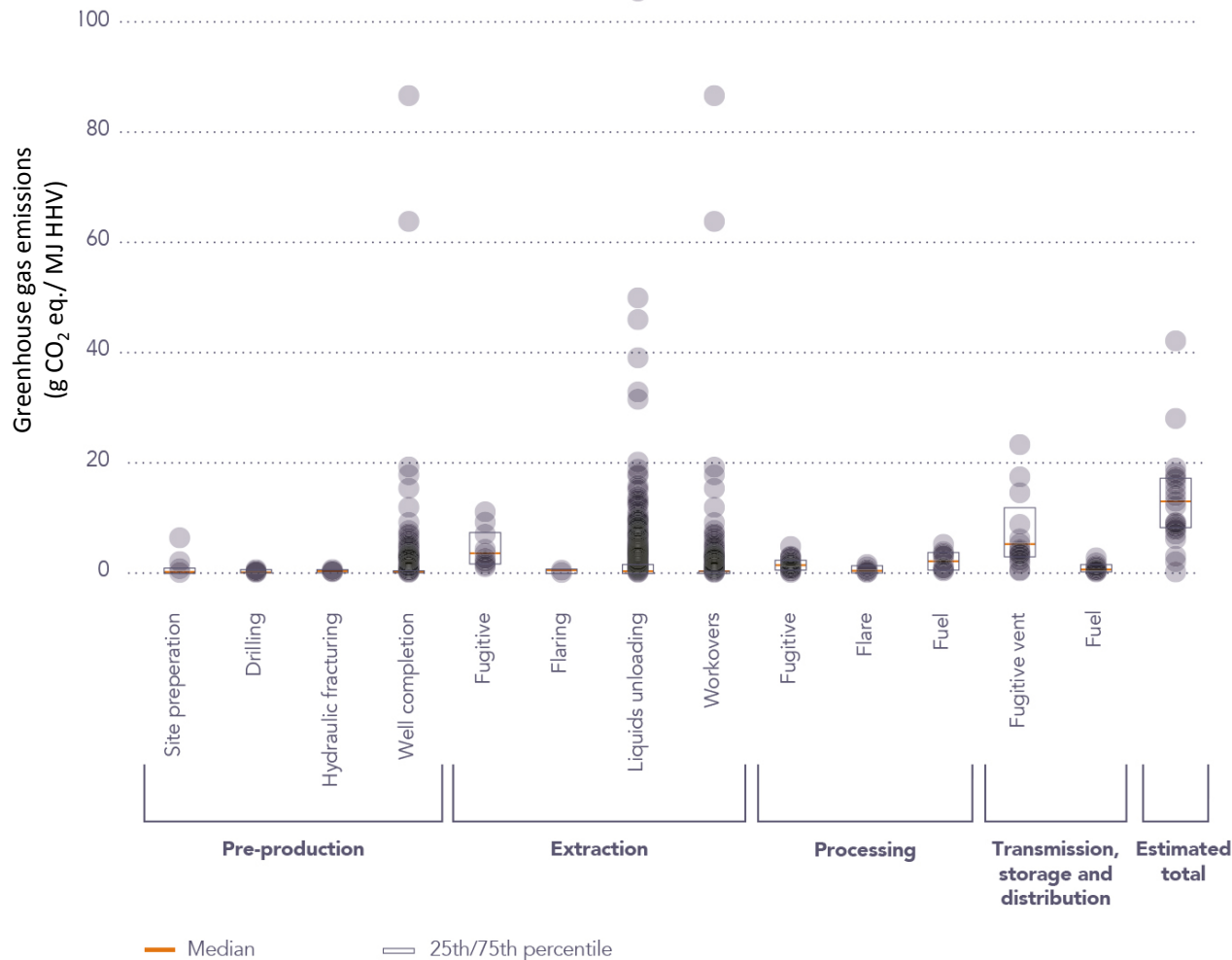
Small release of methane = large impact (at least in the short term)

2. WHITE PAPER

- Evidence assessment
- What are the range of estimated emissions and why?
- Over **250** selected for analysis



OVERALL GHG EMISSIONS

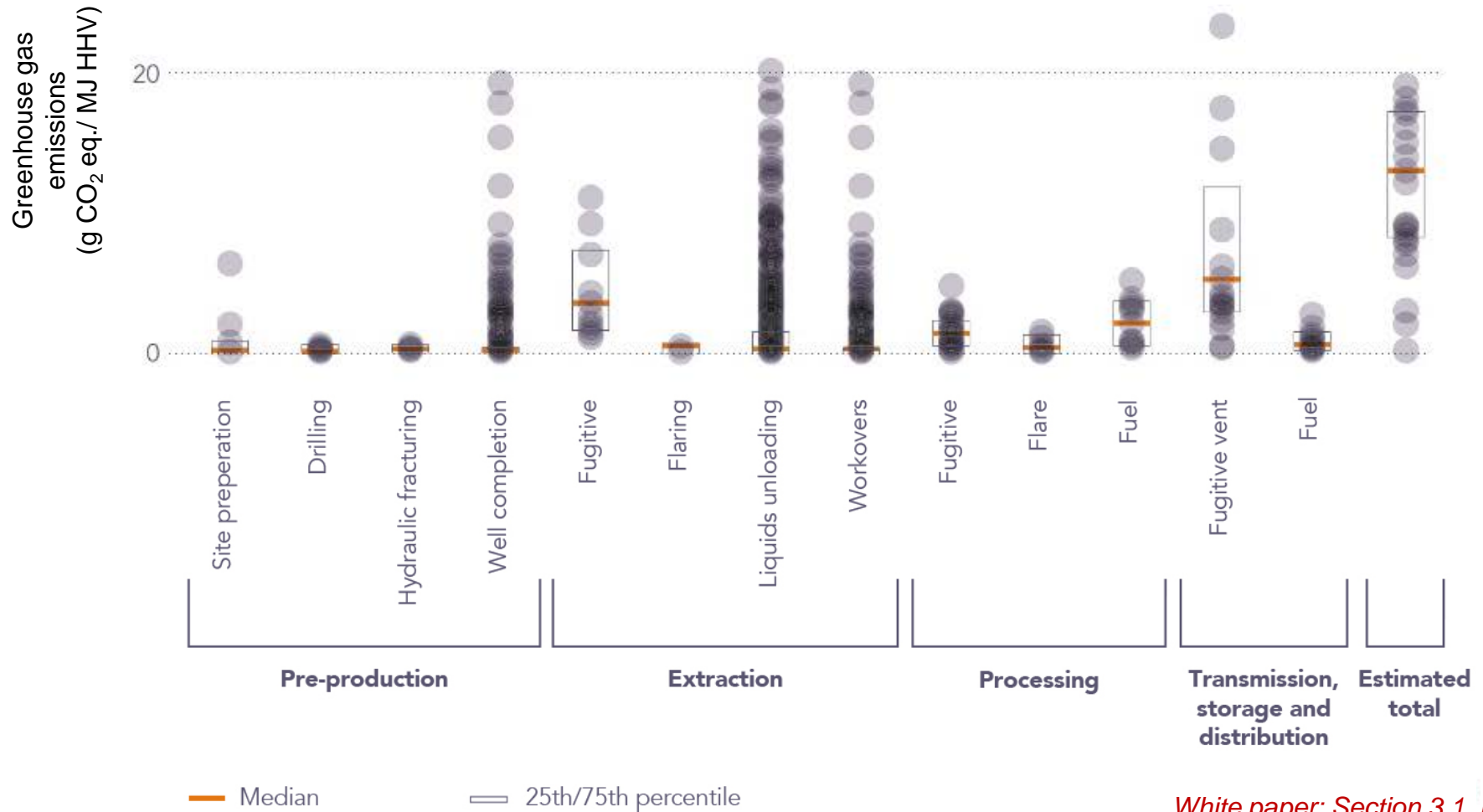


Greenhouse gas emissions:
g CO₂ eq./ MJ

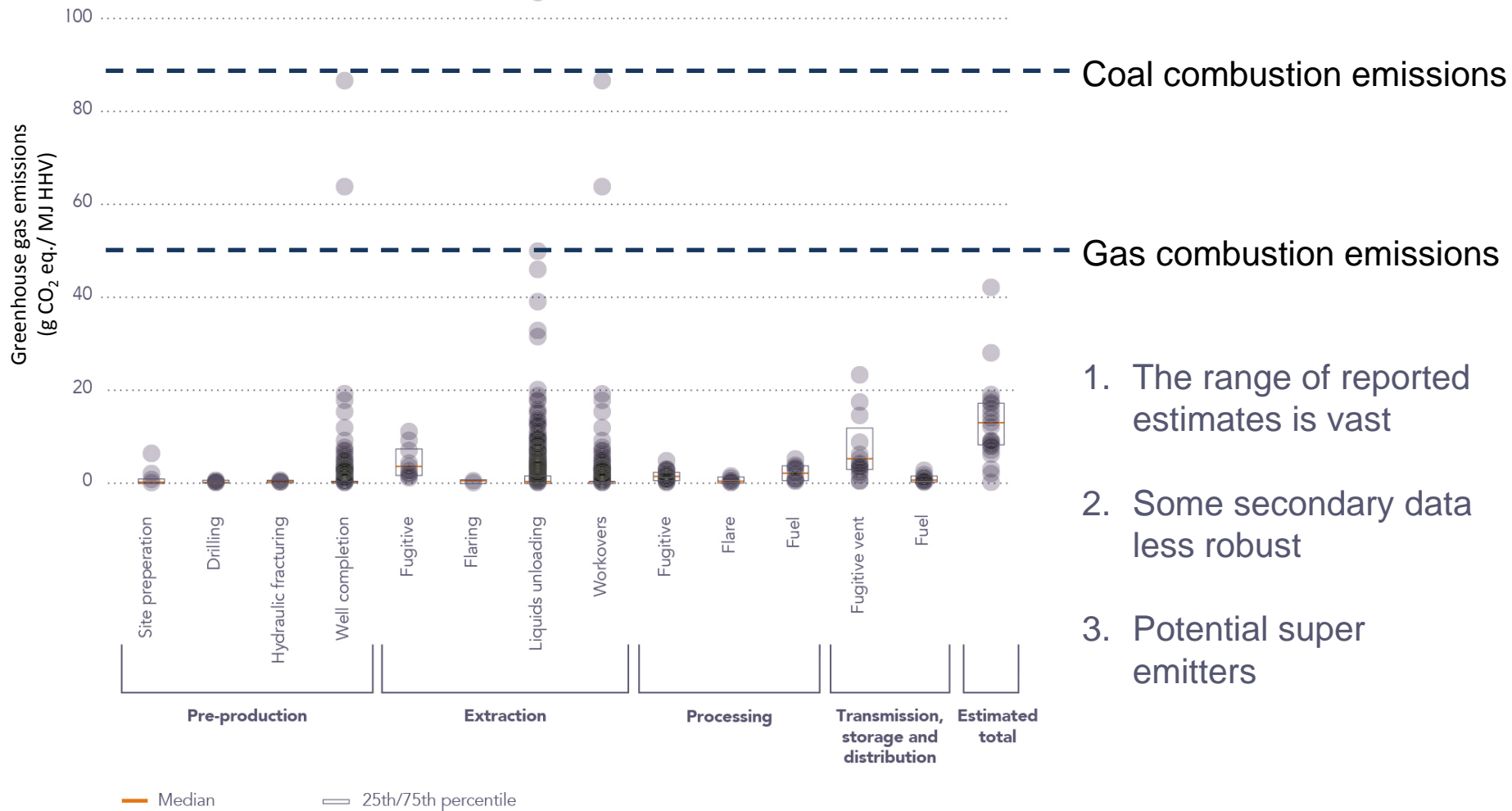
- **g CO₂ eq.** Carbon dioxide plus methane (methane = 34 x CO₂)
- **/ MJ** Energy content of the gas delivered to consumer

1. The range of reported estimates is vast

OVERALL GHG EMISSIONS



OVERALL GHG EMISSIONS



6. FOLLOW-UP RESEARCH

The gap

- Range of estimates is so large, but we don't know the distribution within this range
- If we knew the distribution:
 - More accurate estimate of total emissions
 - Understand the effect of the 'heavy tail' super emitters

Research questions

1. What is the **distribution** of emissions from different supply chain routes?
2. What are the biggest **factors** affecting the distribution?

7. CONCLUSIONS

1. Methane emissions are highly variable
 - but we don't know how variable across different regions
2. Most equipment/ facilities exhibit very low emissions
 - but the exceptional minority cause large emissions
 - top 5% of emitters contribute half of total emissions
3. Super emitters exist at all stages of the supply chain
 - caused by malfunction or maloperation
4. Installing emissions-minimising technologies will reduce emissions significantly
 - but will not eliminate super emitters

7. CONCLUSIONS

Methane-reducing wish-list:

1. More transparent and uniform emissions reporting across regions, independently verified
2. Shared guidance on best available technologies
3. More stringent/ intelligent/ timely emissions detection and remediation