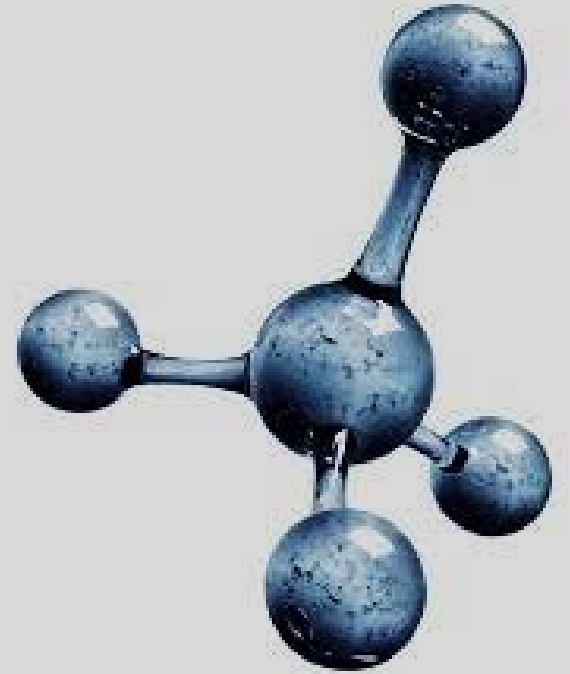




# Managing Methane for Climate Change, Air Pollution, and Public Health

Deborah Gordon  
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SMUD Briefing  
November 12, 2024



**Methane is a powerful greenhouse gas.**

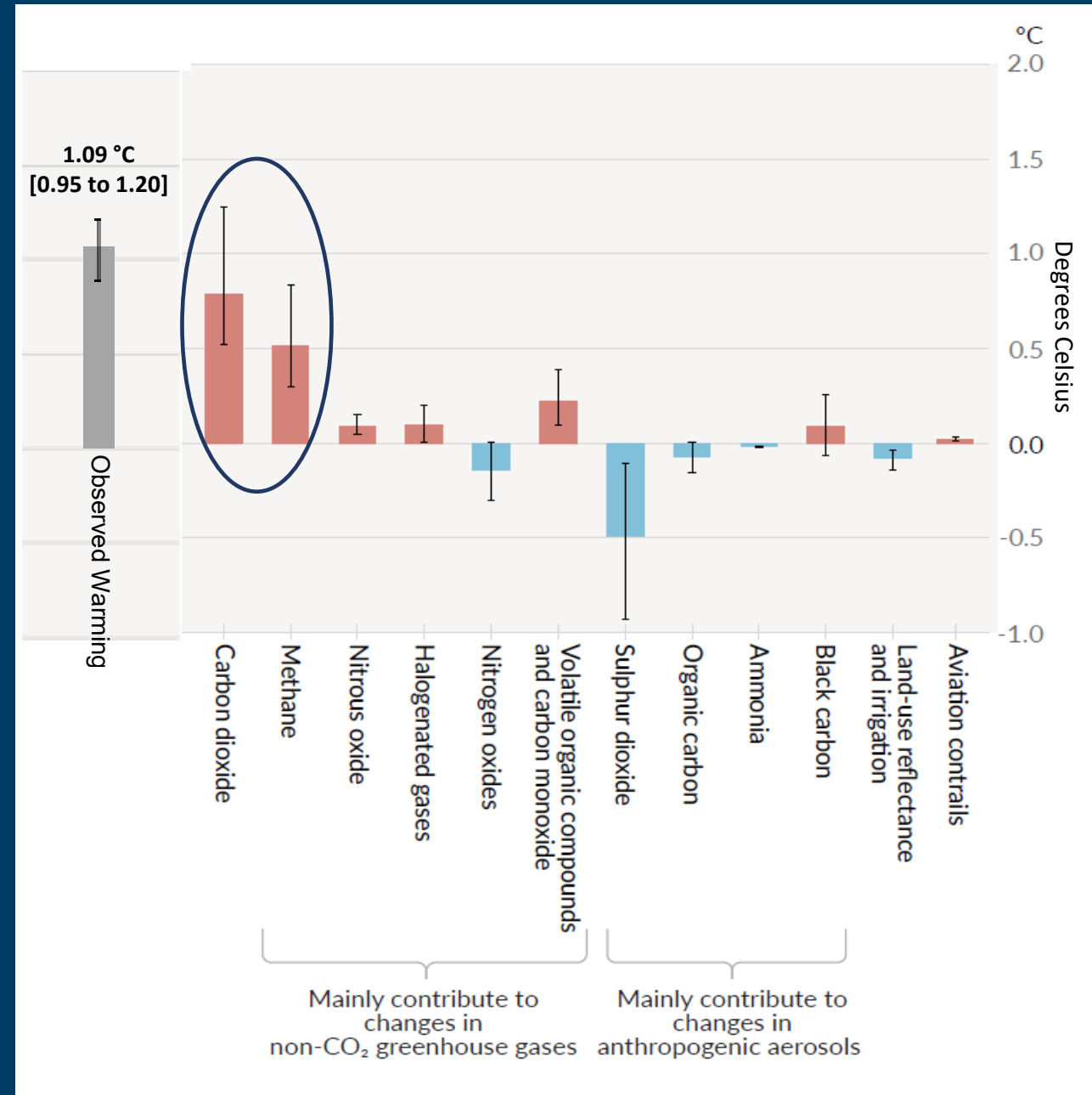
*“Short-lived climate pollutants (SLCP) [like methane] are powerful climate forcers.*

*California set a goal to reduce 40% of its methane emissions by 2030 compared to 2013 levels.”*

— California Air Resources Board

# Methane is on par with CO<sub>2</sub> in warming Earth.

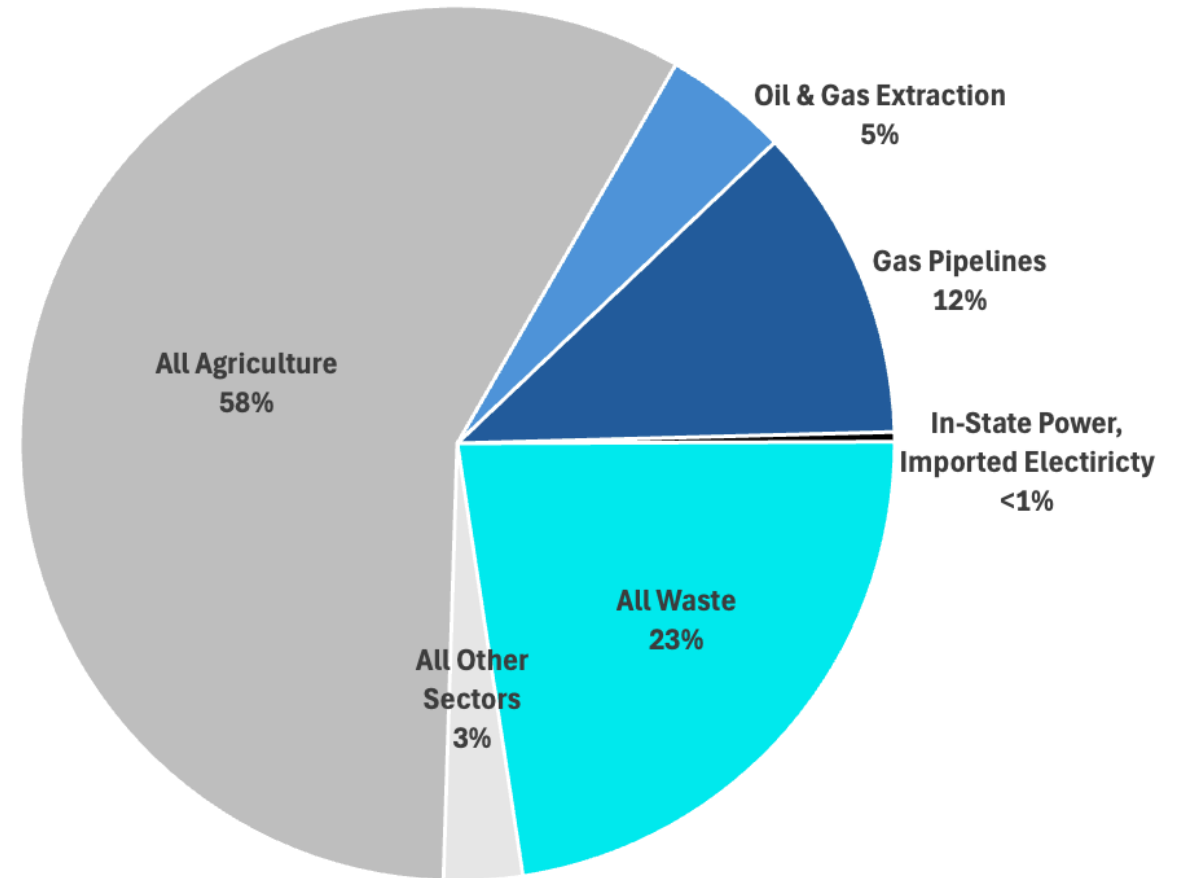
- Methane's global warming potential over 20 years (GWP<sub>20</sub>) is **>80 times more** climate forcing than CO<sub>2</sub>.
- And after its ~one-decade atmospheric lifetime (where methane is >100 times more climate forcing than CO<sub>2</sub>), **methane converts to CO<sub>2</sub>**.



# Methane emissions are concentrated in a few sectors.

**1.6 Mt per year in California**  
Estimated\* total human-made methane

*\* Aerial surveys and satellites are identifying significant methane super-emitters that suggest undercounting in current state and national emissions inventories.*



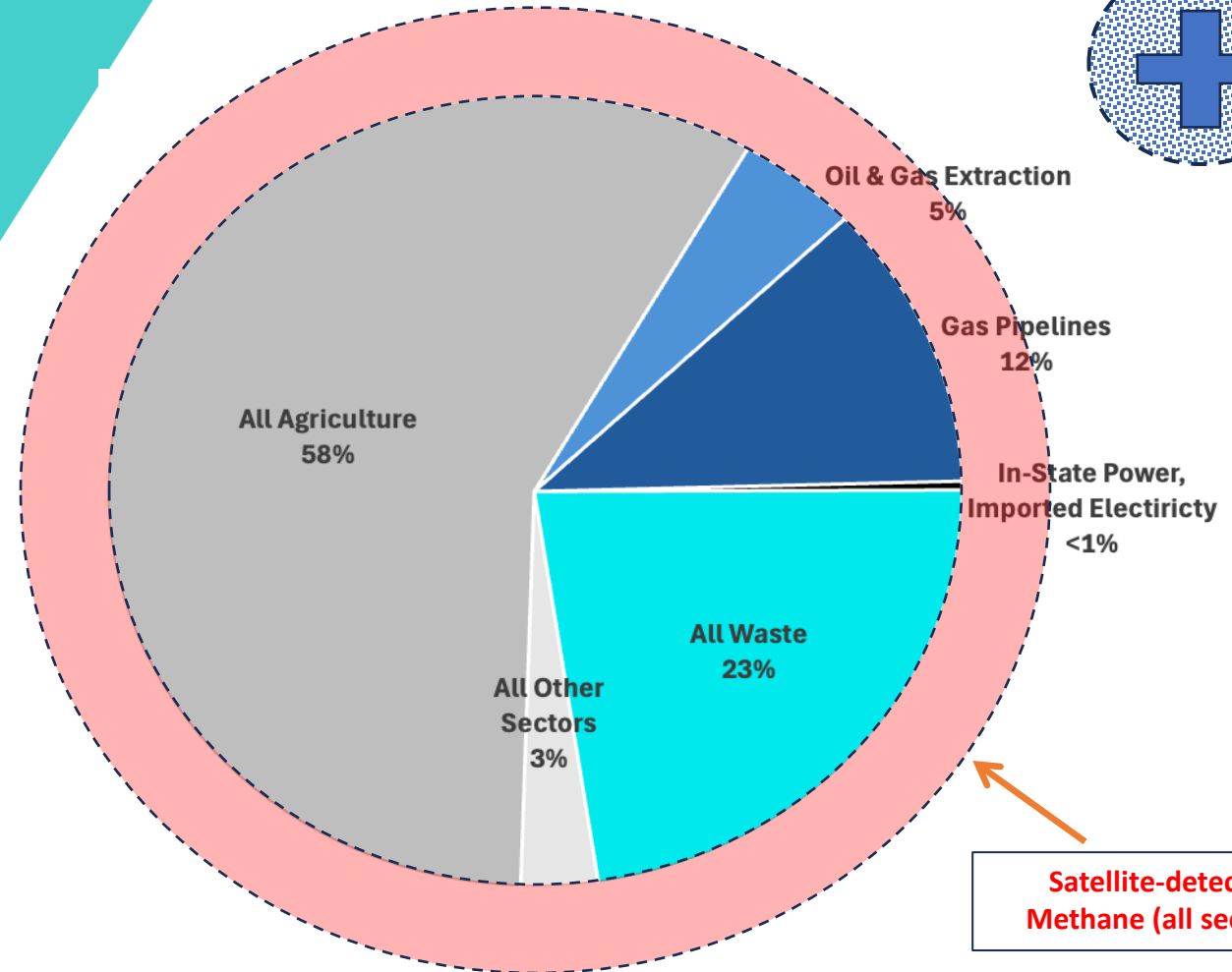
## 2020 CA Methane Emissions, by source

Source: CARB, California, GHG Emissions Inventory Program  
<https://ww2.arb.ca.gov/ghg-slcip-inventory>

# Additional methane emissions exist that can be controlled.

?? Mt per year in CA  
? Mt per year SMUD

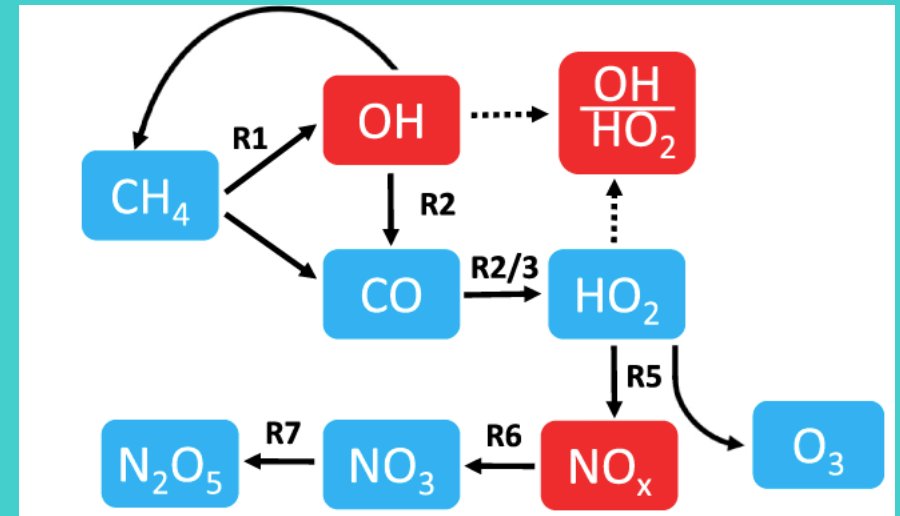
- 92% CA gas imported from other states
- Satellite-detections
  - Carbon Mapper
  - EMIT
  - MethaneSAT
  - Others



# Methane is co-emitted with hazardous air toxins and (indirectly) forms smog.

*“Cutting methane emissions [is] a critical environmental justice opportunity and a critical way to save hundreds of thousands of lives.”*

— Rick Duke, U.S. Department of State



Source: <https://www.nature.com/articles/s41612-022-00247-5>

# Methane measurements from US O&G for use in models, fees, and policies

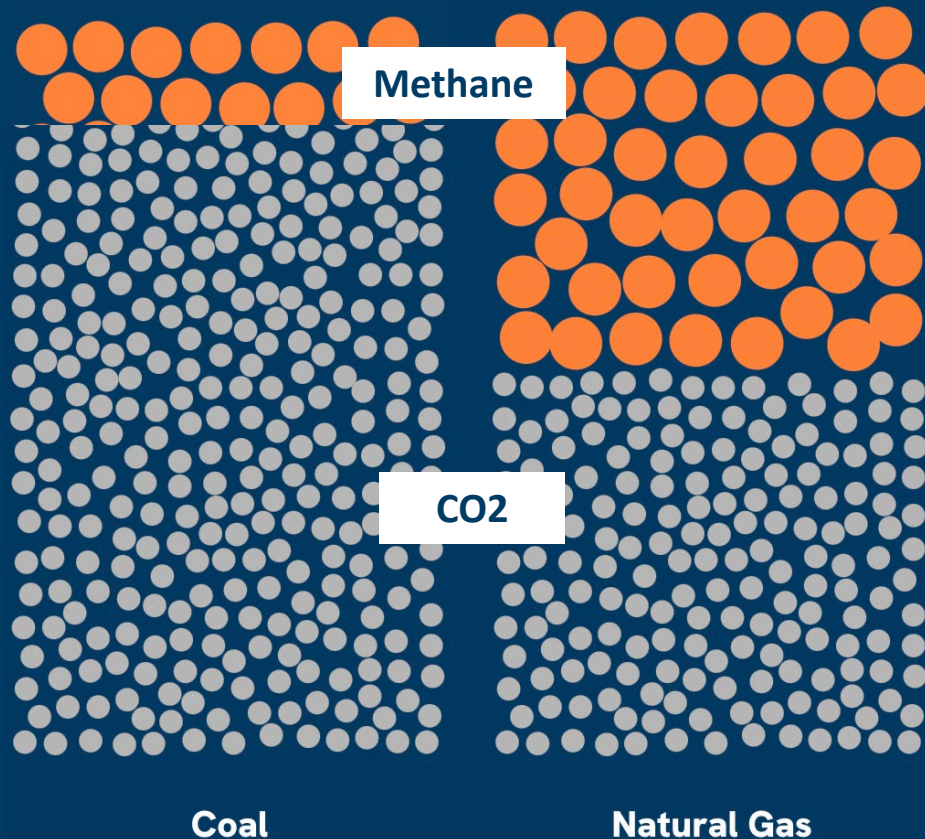
**One million** aerial site measurements taken from 15 campaigns over six US regions comprising 52% of onshore oil and 29% of gas production.

Total estimated methane emissions range from 0.75% to 9.63%

Weighted **average methane intensity is 2.95%**, three-times the national government inventory estimate.

Ancillary midstream facilities, including pipelines, contribute 18–57% of estimated regional emissions.

# Leaky gas can emit GHGs on par with coal.



Net greenhouse gas emissions from gas with a methane leakage as low as 0.2% can be on par with coal.



# Applying RMI's Climate Intelligence

*Leverage emissions transparency to advance decarbonization.*

Oil and gas emissions visibility

Will drive decarbonization on several fronts



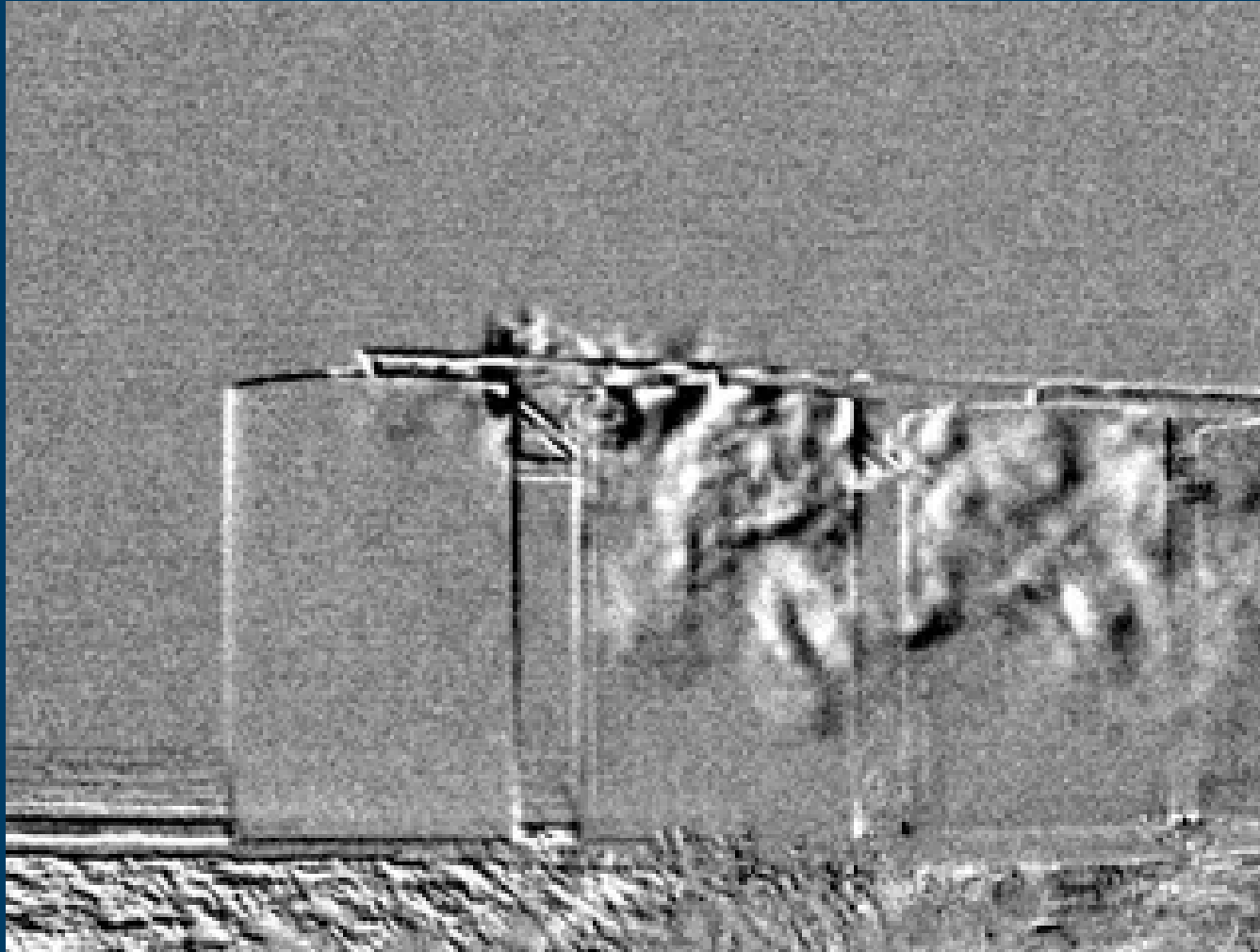
➔ Emissions-differentiated **market** activation

➔ Climate-aligned **corporate** business models

➔ Better **investor** portfolio allocations

➔ Informed **government** policy and regulation

# Make Methane Emissions Visible

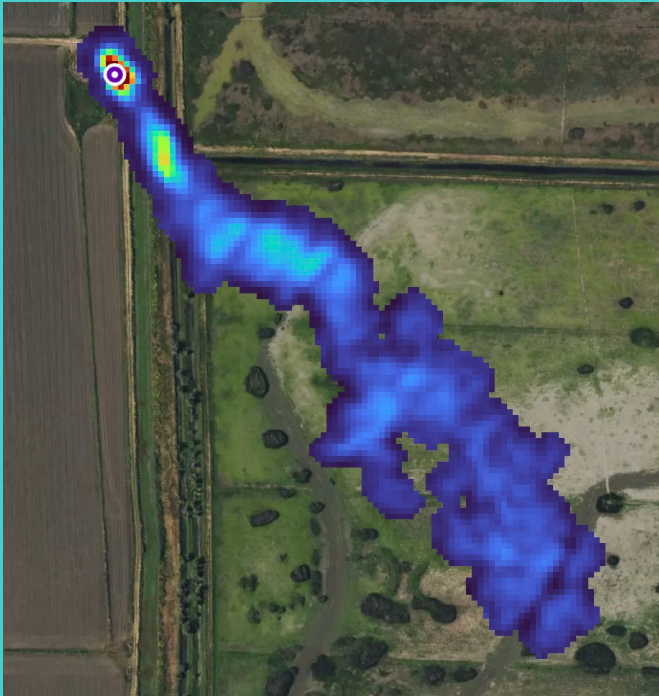


Gas is made up of mostly methane, which is prone to leakage along its extended supply chain from production through end use.

# Detect, Locate, and Quantify Methane

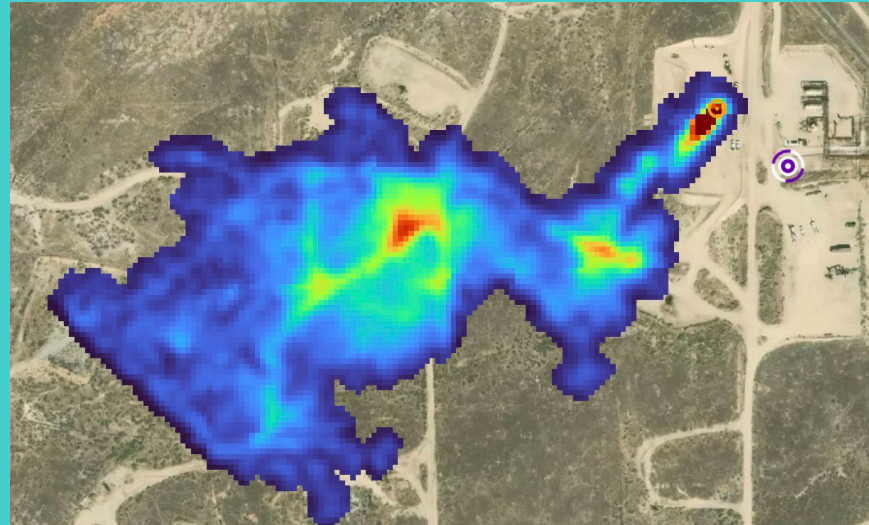
*Targeting the outsized threat and opportunity of super-emitters*

Climate, air quality, public health and environmental justice issues



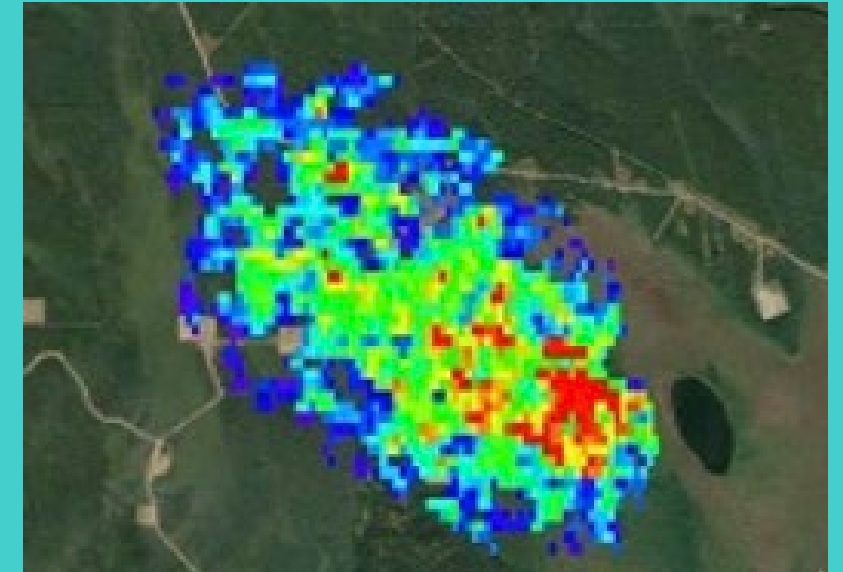
**Methane from Sacramento County gas supplies**  
**Woodland, California**  
**152 kg methane/hour**

Source: [Carbon Mapper Data Portal](#)



**Methane from in-state gas supplies**  
**Taft, California**  
**416 kg methane/hour**

Source: [Carbon Mapper Data Portal](#)



**Methane from out-of-state gas imports**  
**Montney field, Canada**  
**3,392 kg methane/hour**

Source: [Chinese Gaofen Satellite](#)

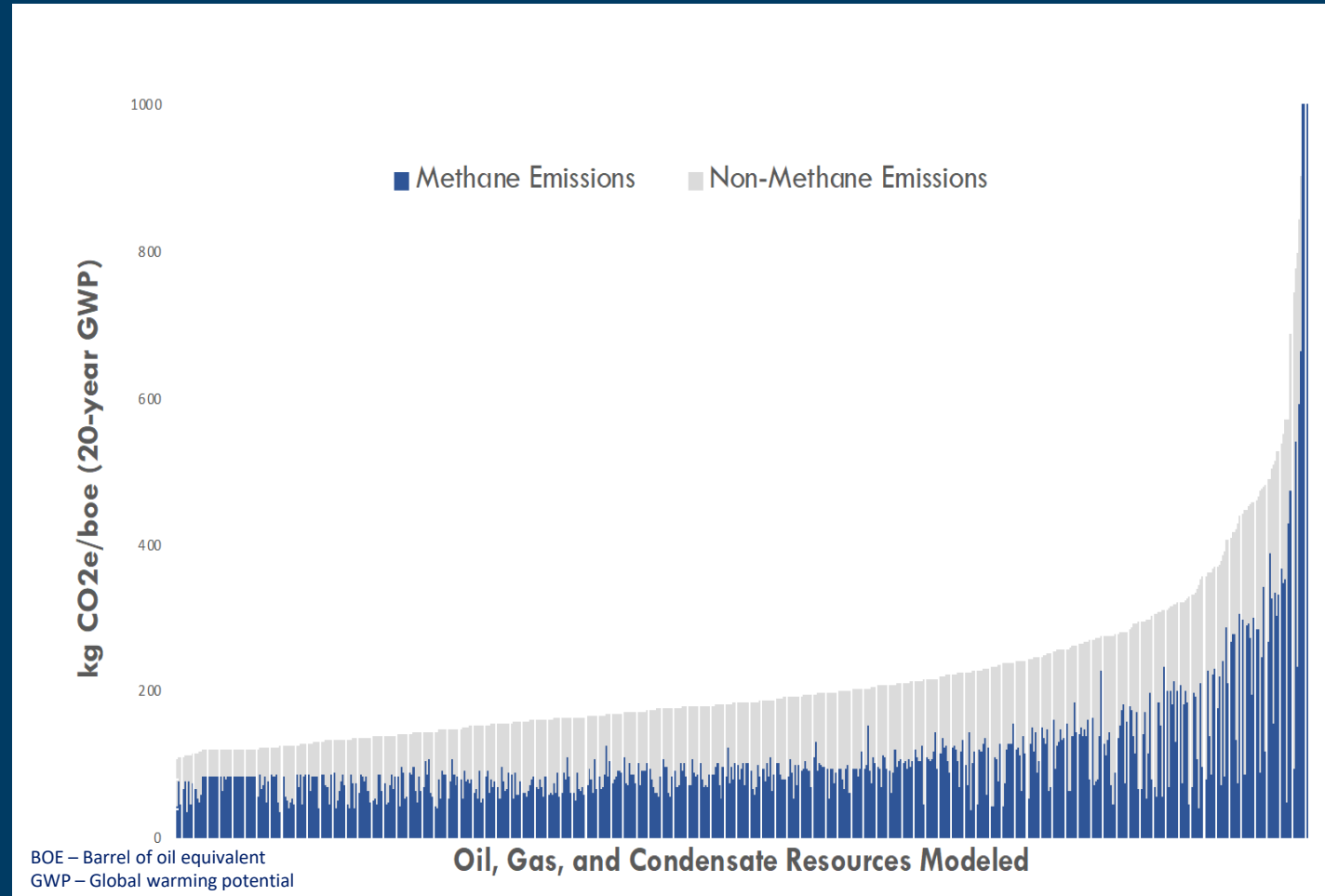
# Preventing methane emissions cuts one-half of the oil and gas industry's wide-ranging climate impact.



Welcome Map Total Emissions Supply Chain Analysis

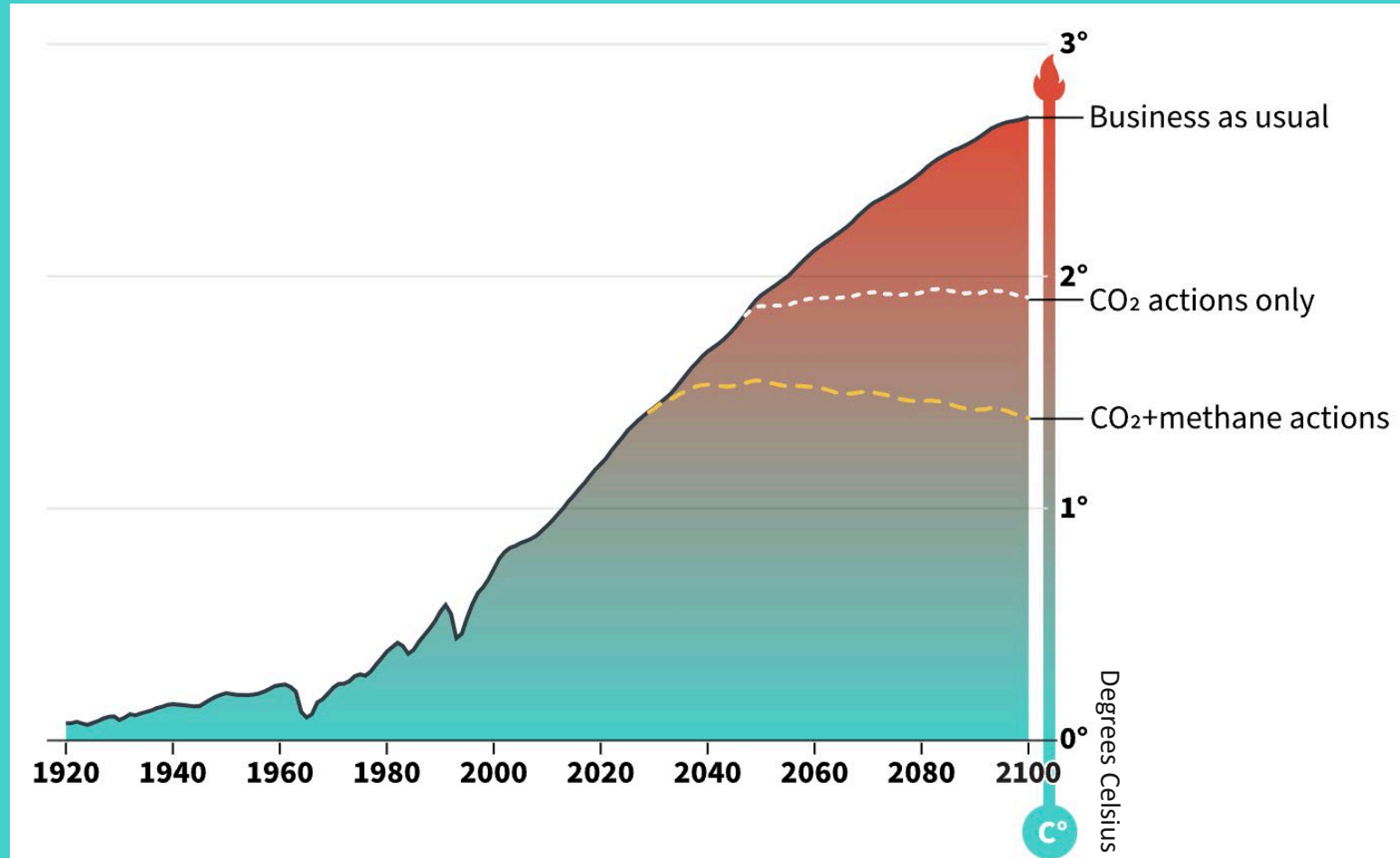
## Assessing Global Oil and Gas Emissions

The OCI+ quantifies and compares greenhouse gas emissions intensities from global oil and gas assets. Use this web tool's interactive features to see where GHGs are emitted and investigate ways to reduce life-cycle emissions intensity from upstream production, midstream refining, and downstream transport and end uses.



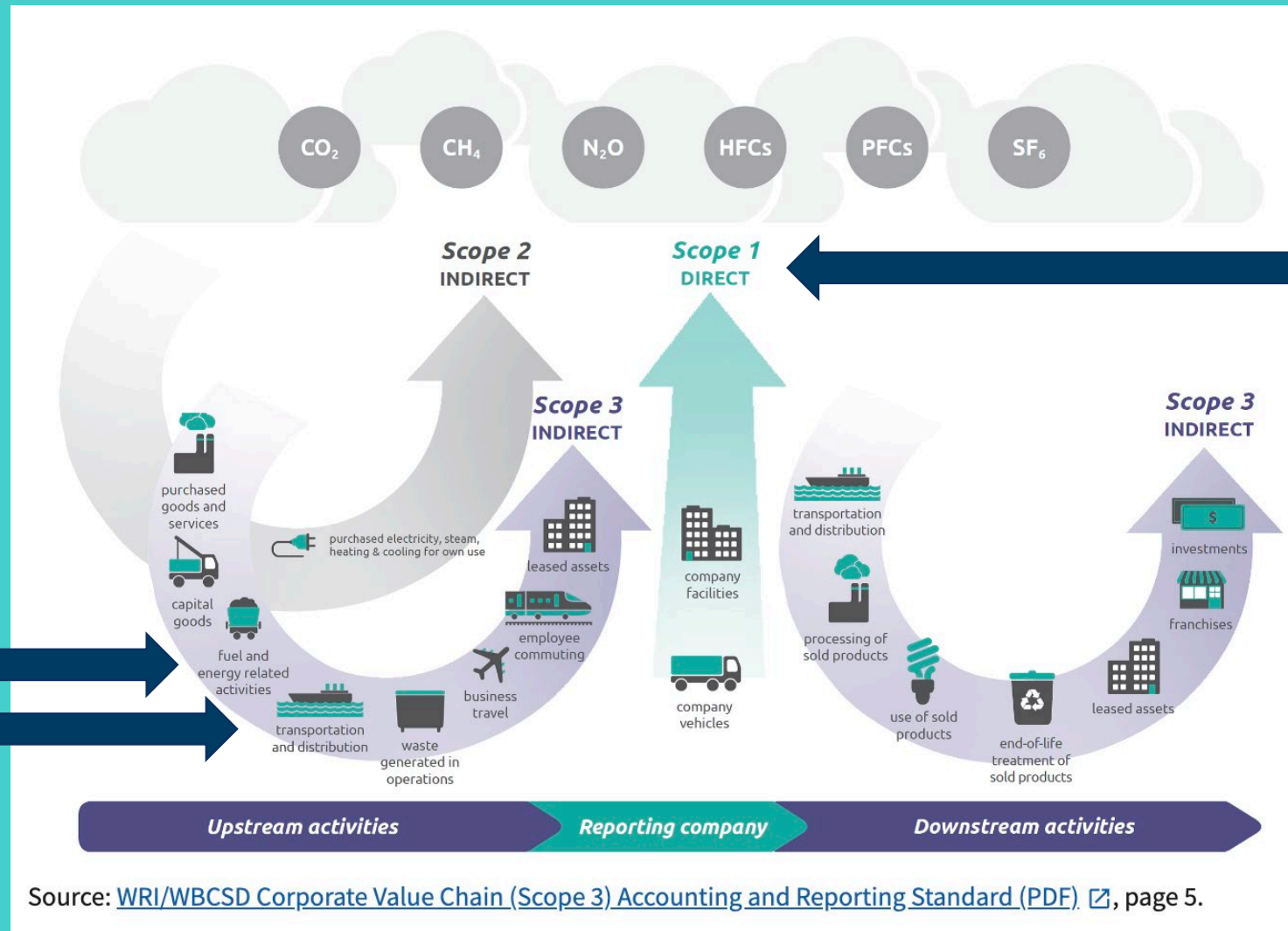
Source: RMI, OCI+ Web tool, 2023, modeling ~70% global O&G supplies.

# Avoided warming from simultaneous mitigation of CO<sub>2</sub> PLUS methane can align with a 1.5°C future.



Source: RMI, <https://rmi.org/two-carbon-co-conspirators-need-to-be-stopped-to-tackle-climate-change/>

# SMUD can foster Scope 3 GHG reduction beyond its Scope 1 direct emissions.



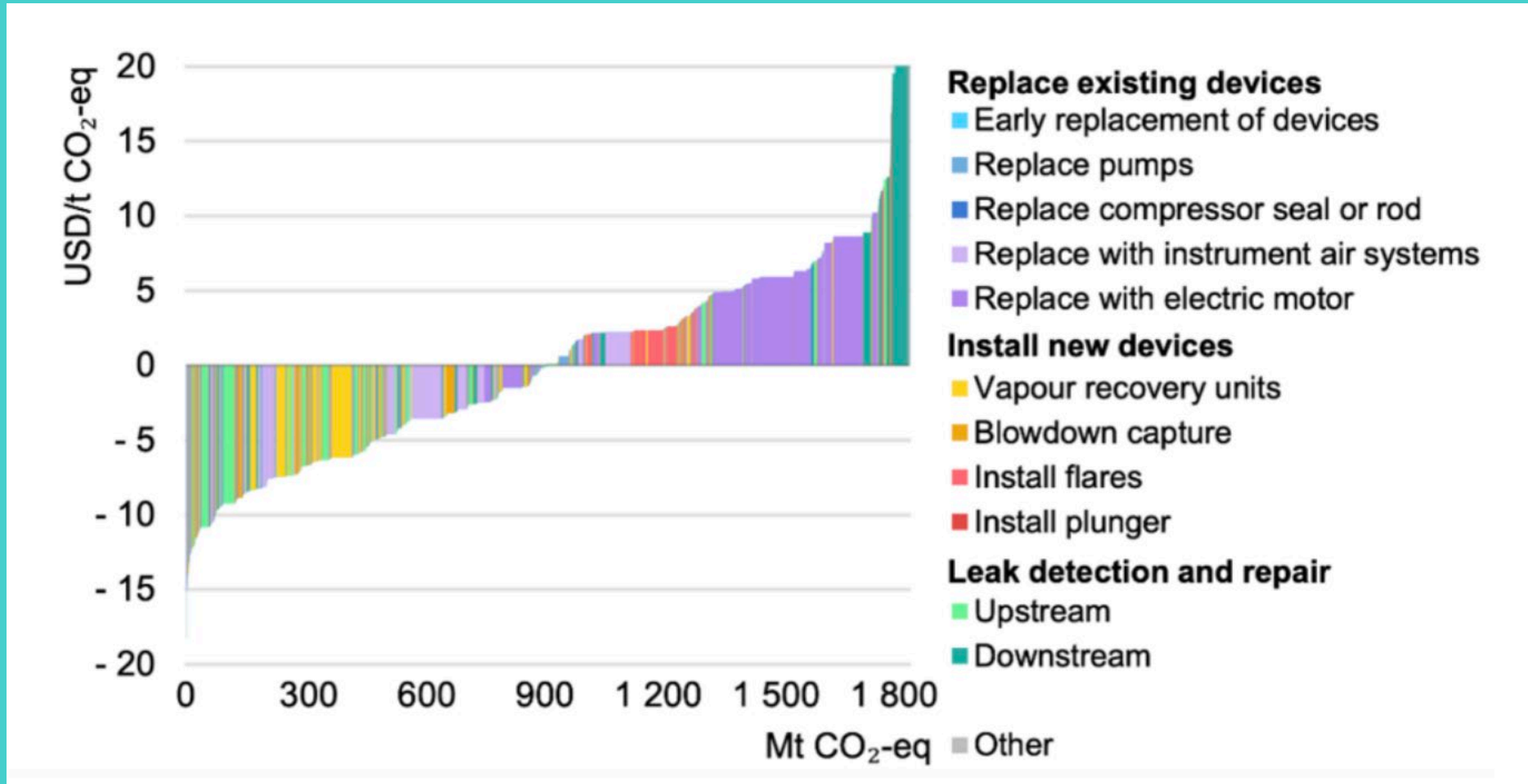
In-state gas producers

Out-of-state gas producers

In-state and out-of-state transmission pipelines

SMUD turbines, power plants, pipelines, and company vehicles

# Taking action to reduce SMUD's Scope 1 & 3 methane emissions can be very cost effective.



Source: International Energy Agency, May 2023, <https://www.iea.org/reports/emissions-from-oil-and-gas-operations-in-net-zero-transitions>

# Near-term methane mitigation opportunities

## *Increase transparency:*

- Identify **where SMUD gas is procured** from and quantify supply chain methane emissions using credible, independent data and analytics.

## *Track methane:*

- Detect and attribute business-as-usual and super-emissions, **create regional methane inventory**, spot and fix leakage, develop mitigation plans to curtail methane emissions.

## *Establish voluntary markets:*

- Participate in **buyer-seller alliance** using an independent, verifiable certification process to differentiate gas and grade it based on its emissions to incentivize rapid mitigation.

## *Advance policymaking:*

- Convert voluntary markets into mandatory performance standards, financial instruments, and **update CA regulations** (e.g., remove legacy methane exemption in local air districts so they can regulate O&G sources, add low-methane gas into LCFS).



# RMI and our partners are cutting methane.

## Update emissions inventories

Comprehensively **assess and routinely update** global methane emissions from oil and gas and waste.

## Use public platforms

Increase data transparency using **models, measurements,** and open-source analytics.

## Identify suppliers with super-emissions

Purchase satellite data that offers **near real-time tracking** of emissions and health hazards.

## Certify and cut emissions

**Procure low-methane gas** with its emissions openly and verifiably measured from O&G operations and landfills.



# Thank you

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