

# 2024 Global Methane Forum

Mobilizing Methane Action

18-21 March 2024, Geneva, Switzerland

## Digital Engineering Platforms to Accelerate Methane Emissions Reductions

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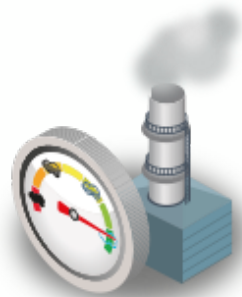
# Process Ecology Inc

- Founded in 2003, Calgary, AB
- We help our clients identify solutions to improve sustainability
  
- Extensive experience in process modelling and optimization, emissions management and software development
  - Regulatory/ ESG reporting
  - Evaluation of emissions mitigation technologies
  - Process/ supply chain analysis and optimization with GHG implications

**Sustainable Energy**

Unit, facility or systems analysis

# OUR CORE COMPETENCIES



## Emissions Estimation and Management

Process Ecology supports ensuring compliance with air emissions regulations and ESG reporting while finding opportunities to reduce emissions and cost (60+ operating companies in Western Canada)



## Process Engineering and Simulation

A team of process simulation and optimization engineers supports the Upstream and downstream Oil & Gas sector maximize the profitability of their assets.

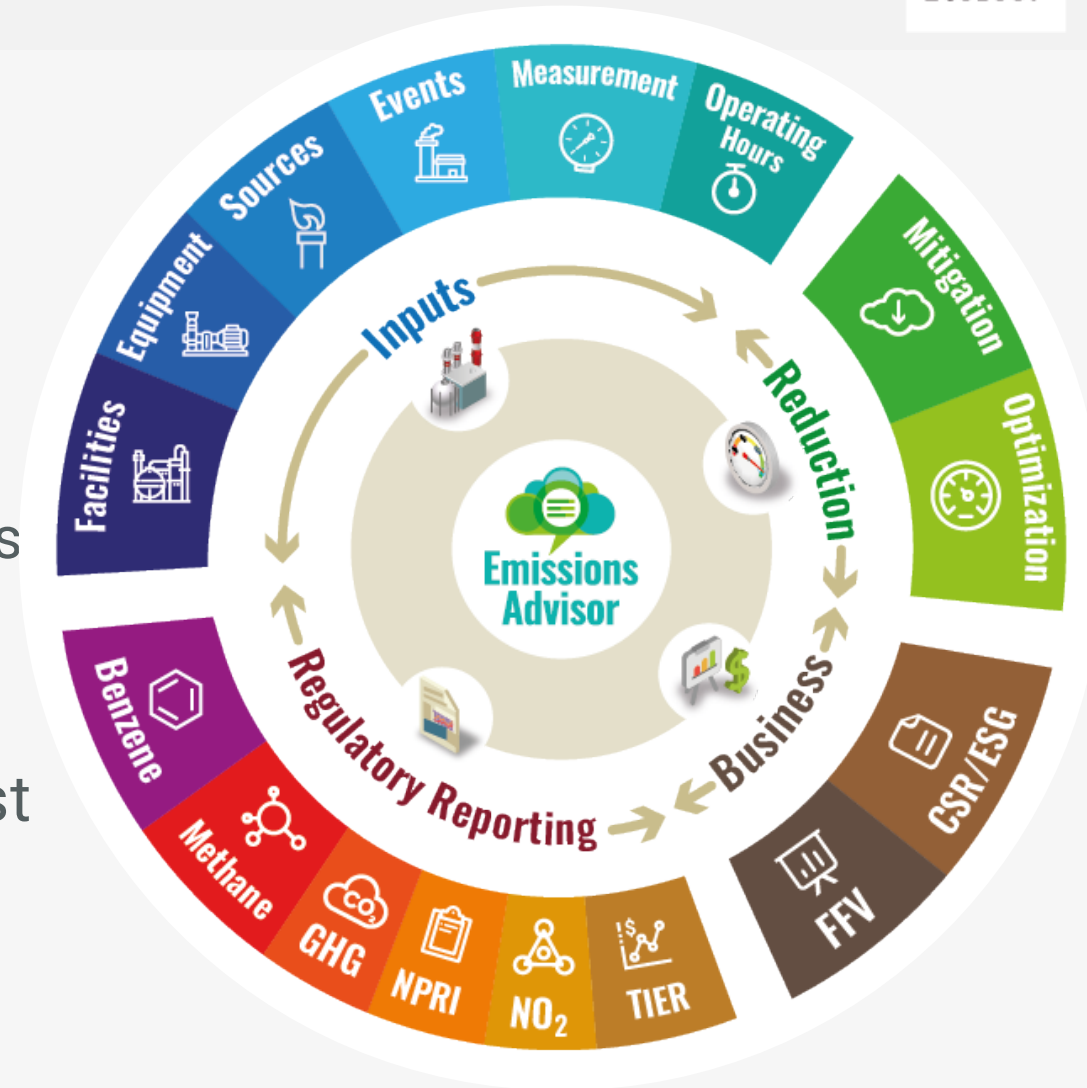


## Decision support software and tools

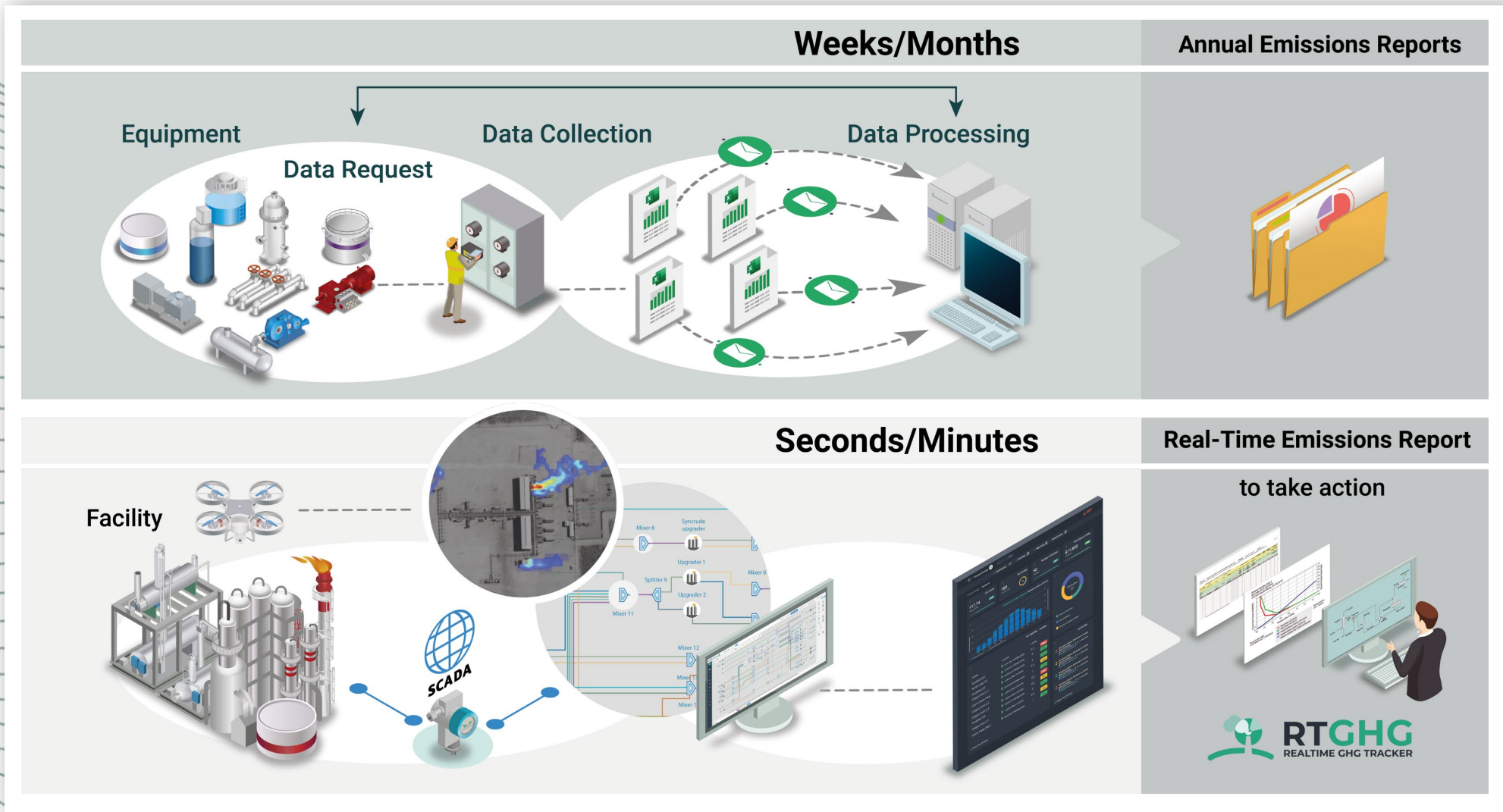
Develop innovative simulation and optimization software tools that help identify better solutions to industry's most challenging problems

# Methane Emissions Management- Oil & Gas

- Multiple datasets required for a detailed inventory of emissions- continuous data feeds:
  - Production accounting, operations, EHS, engineering
  - Different spatial and temporal considerations to aggregate in a single high-level view
- Leverage regulatory activities to find the best opportunities to reduce emissions, cost and optimize operations.

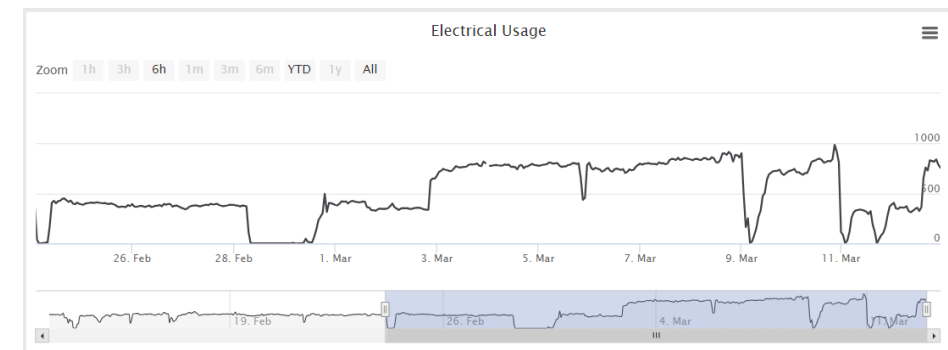
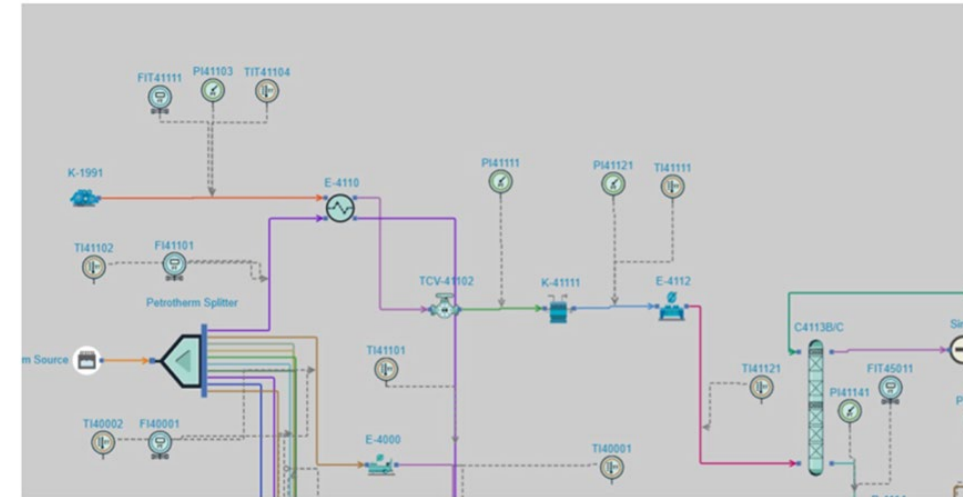


# Workflow Efficiencies and Real Time Tracking



# Real-Time Emissions Tracking

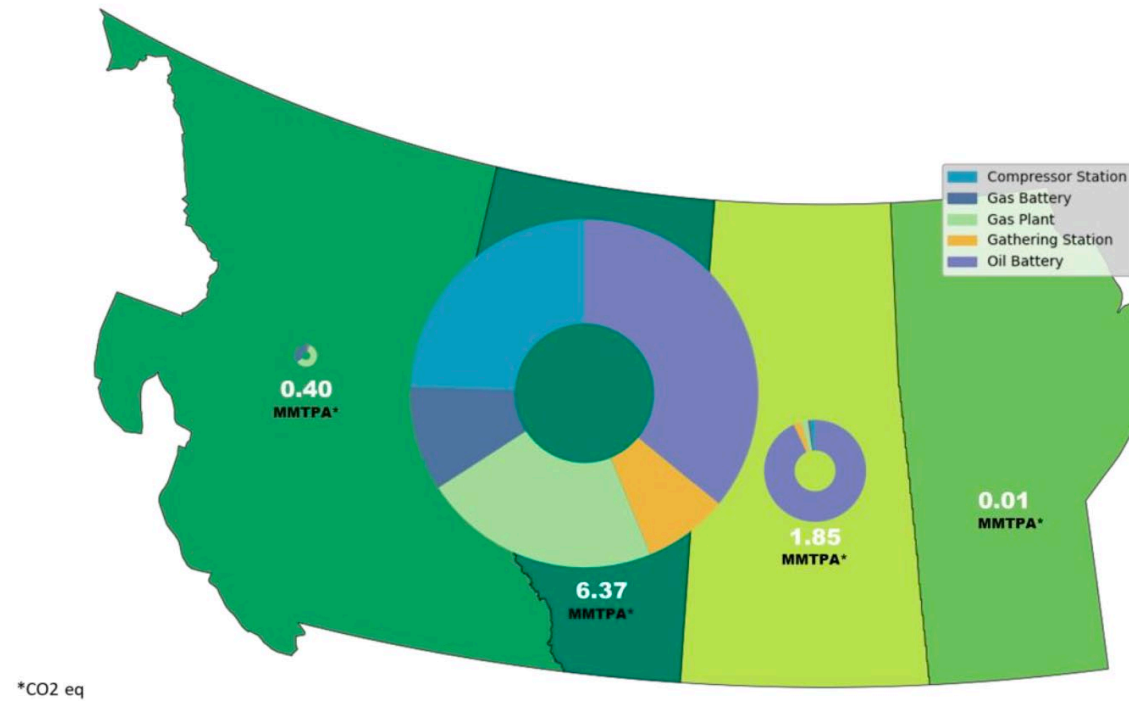
- 1 Real time tracking delivers a **high-fidelity** view into emissions sources
- 2 Enables the identification of root causes for emissions
- 3 **Reduces the time and cost** of gathering data and taking corrective actions
- 4 Provides **single source of truth** with data **every stakeholder can trust.**
- 5 Delivers the required time resolution for meaningful top-down, bottom-up reconciliation.



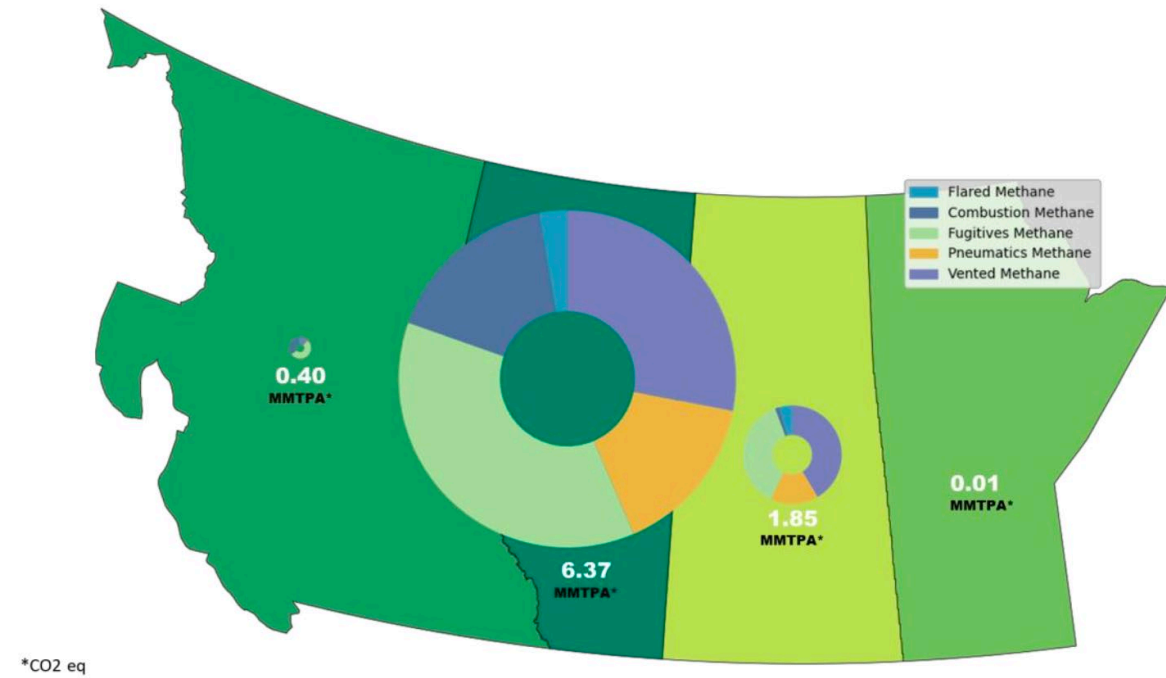
# Lessons Learned

- Data availability challenge: start with best available and continuously improve
- Analyze workflows/data flows for custom solutions: data silos in operating companies must be addressed
- Leverage available data sources (e.g. SCADA) and process modelling / simulation
- Better inventories great as long as these lead to mitigation actions

# Methane Emissions Across Western Canada



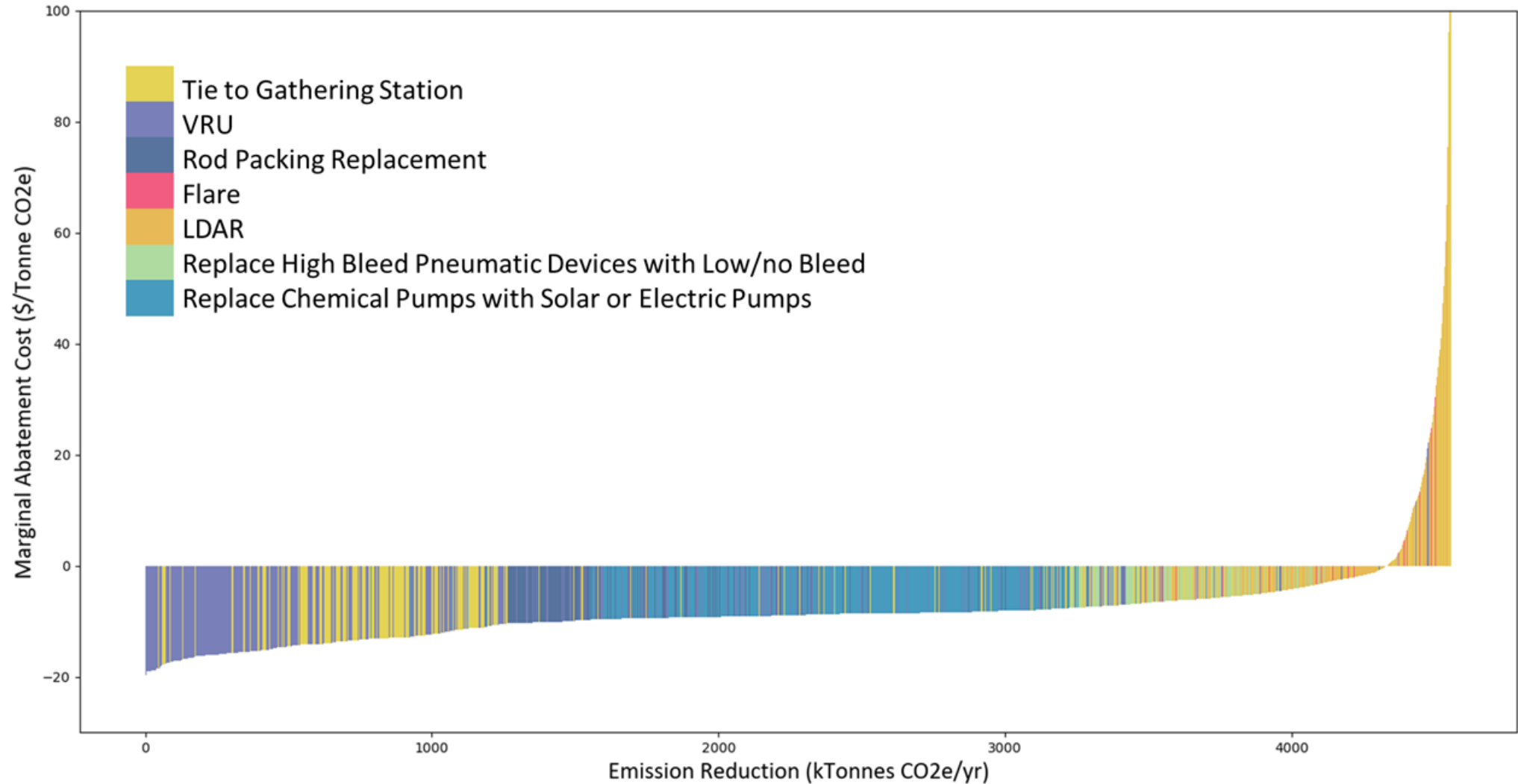
By facility type



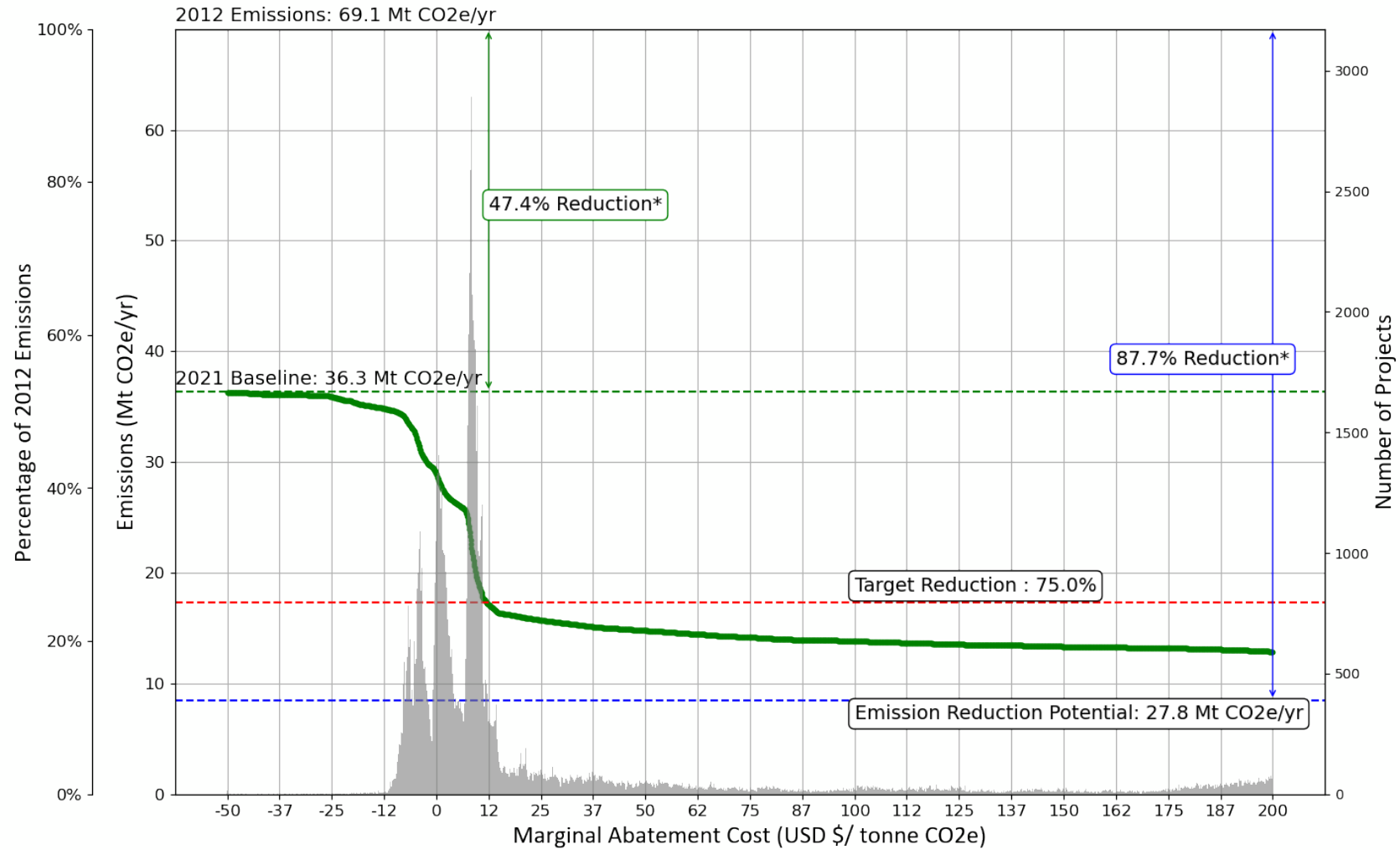
By source type



# Lowest MAC Strategy – Mitigation Strategy for Canada



# Cumulative Reduction from 2012 Baseline Emissions



\*From 2012 Baseline

# Conclusions

- ✓ **Methane emissions reduction is both a data challenge and a process engineering challenge**
  - Large volumes of data in multiple formats from multiple sources
  - Better emissions quantification valuable IF it leads to mitigation-process engineering
- **Inventories can be kept updated via systems integration projects**
  - Real time emissions tracking delivers the required time resolution for meaningful top-down, bottom-up estimates reconciliation AND root cause analysis for mitigation.
- **Digital platforms with powerful engineering algorithms can support the efficient identification of optimal mitigation strategies**
  - Solutions depend heavily on facility type, location, activity, process configuration and surrounding infrastructure.
- ✓ **Canadian UOG: Based on 2021 data, the mitigation analysis indicates that a 75% reduction from 2012 baseline is attainable at marginal abatement costs lower than 15 USD\$/tonne**
  - Although economically reasonable, the target calls for over **140,000** individual projects which pose major logistic and implementation challenges.
  - Activities such as LDAR programs need to be redesigned to enable rapid scalability



THANK YOU

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