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End-to-End  
Emissions  
Solutions

# The Role of Digital in Methane Emission Reduction

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**Schlumberger End-to-End Emission Solutions (SEES)**

# Methane Quantification & Reduction Challenges

Varying Measurement Technologies

Requires Collaboration between Domains & Business Segments

Balancing Cost, Efficiency & Feasibility Across Asset Lifecycle

Tracking progress on a source-by-source basis

Varies significantly between asset

Sources: EPA, EDF, ICF, Devon Energy

Sector	Supply Chain Segment	Total Emissions	Total Abatement Potential	Abatement Potential at Less than Net Zero Cost	
		MMt CO <sub>2</sub> e/yr	MMt CO <sub>2</sub> e/yr	Partial Revenue	Full Revenue
Category	Emissions Source	Number of Platforms With Source	Count on All Platforms	CH <sub>4</sub> Emissions (tonnes/year)	CH <sub>4</sub> Emissions (m <sup>3</sup> /year)
Venting (new)	Centrifugal compressor wet seal oil degassing	10	148	22,923	33,705,576
Venting	Cold vent	4	4	2,558	3,761,669
Venting	Glycol dehydrator	2	3	260	382,671
Venting (new)	Reciprocating compressor rod packing venting	6	26	133	195,401
Venting (revised)	Storage tank - venting	9	11	95	139,907
Venting (new)	Centrifugal compressor dry seal vent	3	17	92	135,506
Venting	Mud degassing	2	2	5	8,056
Venting	Pneumatic pumps	3	5	2	2,871
Venting	Pressure/level controllers	2	4	1	1,450
Fugitives	Fugitives – other equipment	15	19,840	1,255	1,845,549
Fugitives	Fugitives – valves	15	30,671	726	1,067,724
Fugitives	Fugitives – flanges	14	41,221	79	115,873
Fugitives	Fugitives – connectors	15	34,151	45	65,739
Fugitives	Fugitives – pumps	14	299	10	14,796
Fugitives	Fugitives – centrifugal compressor, wet seal face	6	148	8	14,264
Fugitives	Fugitives – centrifugal pack	8	125	7	10,355
Fugitives	Fugitives – open-ended lines	3	436	4	6,192
Fugitives	Fugitives – centrifugal compressor, dry seal face	3	17	1	1,857
Combustion	Natural gas engine	6	13	1,023	1,504,872
Combustion	Flare	14	47	127	186,859
Combustion	Natural gas turbine	15	70	111	163,294
Combustion	Boiler/heater/burner	5	17	4	5,900
Combustion	Diesel engine	13	116	2	3,086
Combustion	Drilling rig	5	5	0	0
<b>Total Emissions</b>				29,475	43,339,467

# How Digital Can Enable Improvements in Methane Emission Management

Cost-Effective Technology Evaluation

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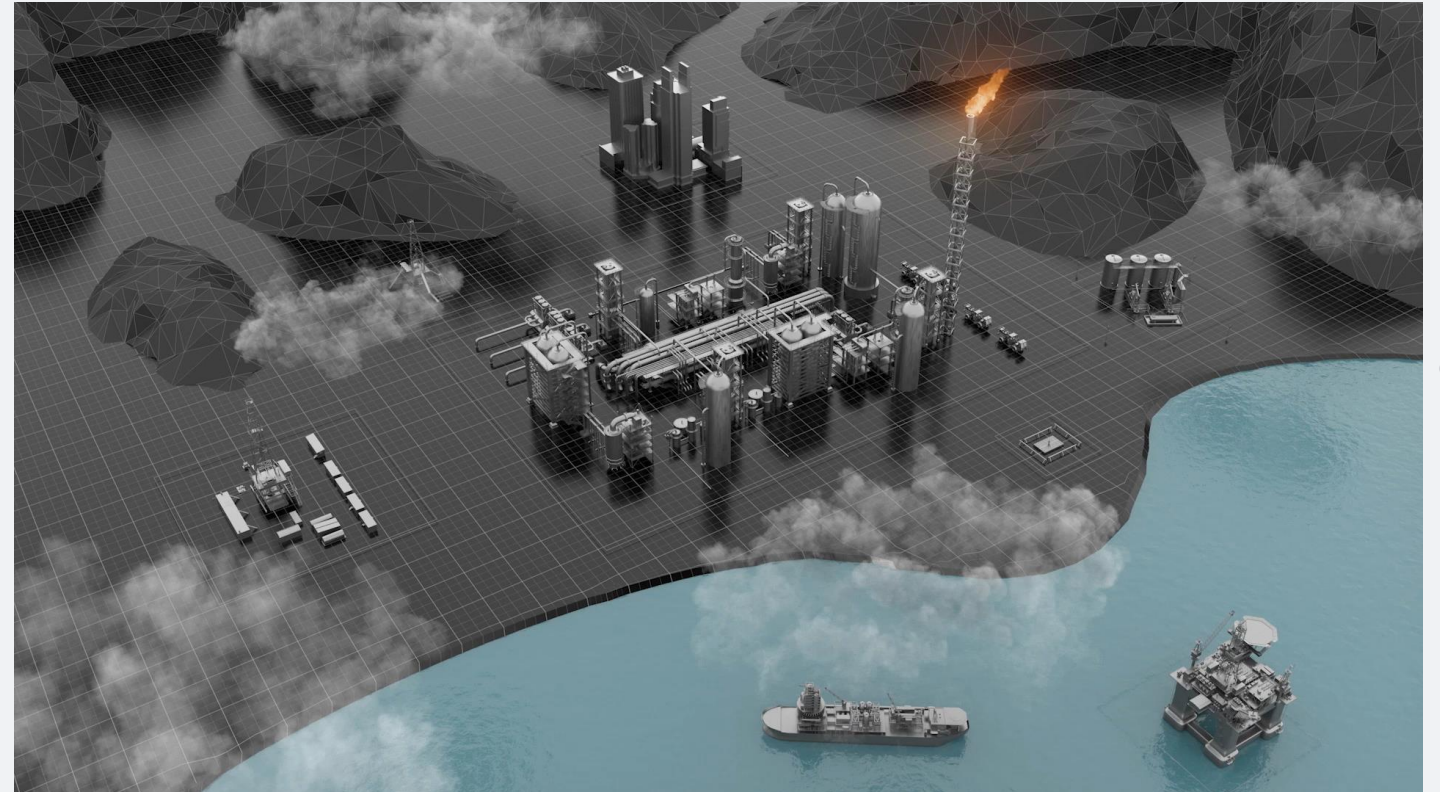
Prioritize & Focus

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Tracking & Monitoring

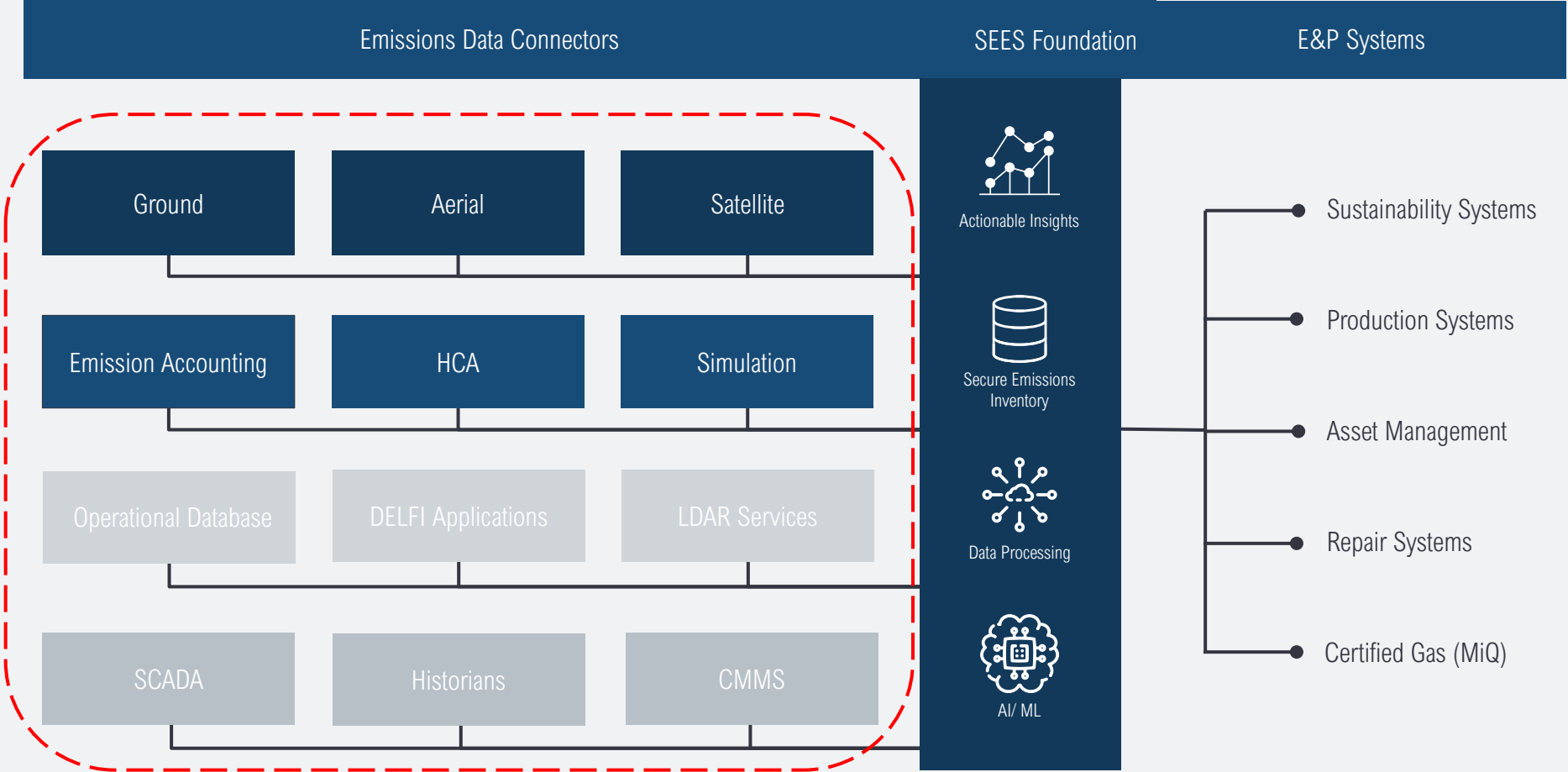
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Workflows & Standards



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# Identify Data Gaps – Establish Solid and Flexible Inventory



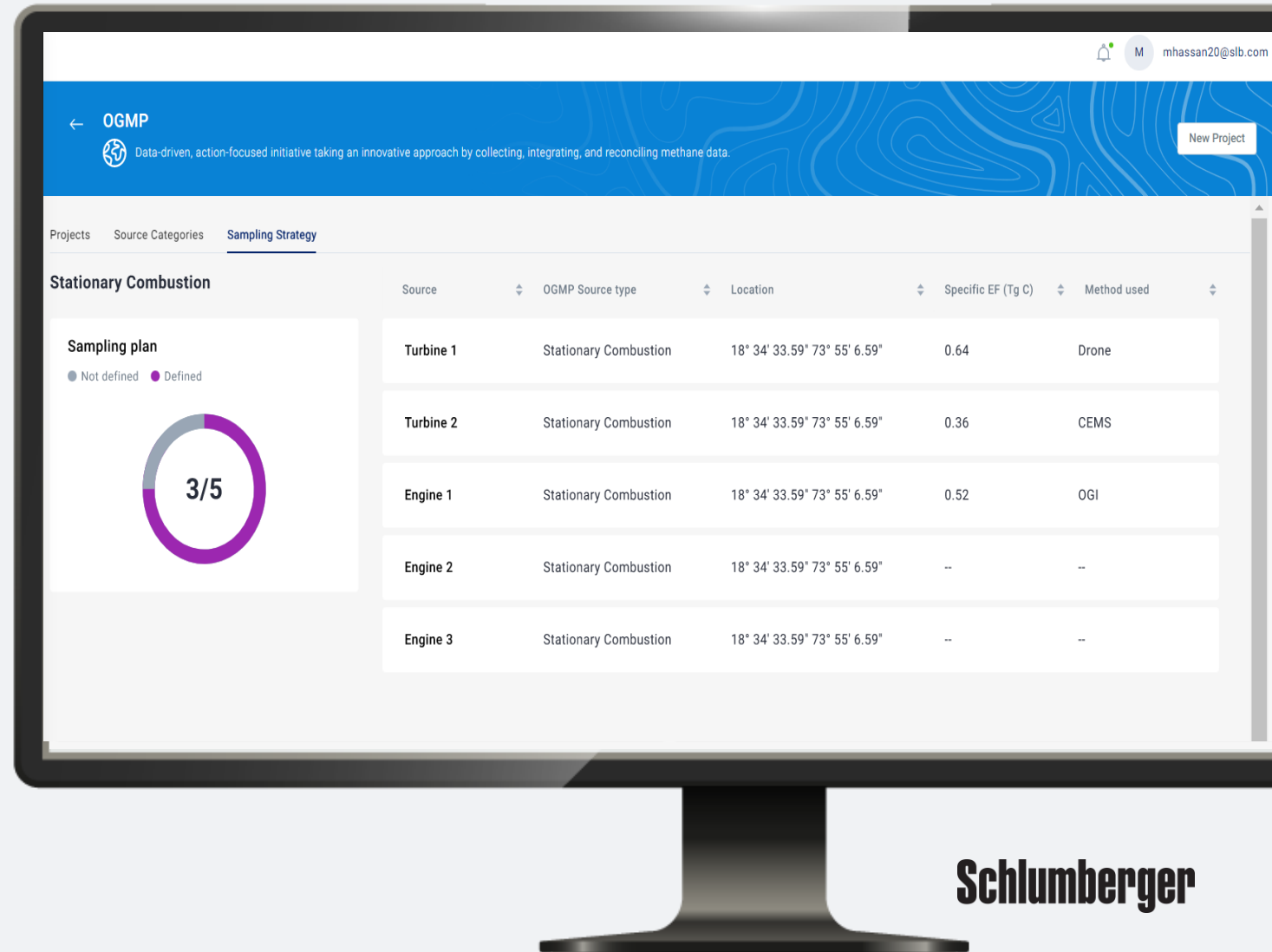
# Reduction is not a one off exercise – Aim for continuous improvement

Establish Site & Source Monitoring Methodology

Establish SMART End Goals

Don't Replace – Utilize to Enable Actions

Build Sampling Strategy



# Multi- Measurements Emissions Management

Define Smaller Projects

Evaluate Measurement & Inspection Strategies

Establish Combined Measurements Strategy

Localization Matter

Close The Loop

Locations > Lake Amel

Max Mustermann  
Site Manager

### Lake Amel

Insights Overview Emission Records Inventory Observations Abatement Options

**Alert**  
IoT Continuous Monitoring has reported gas leak on Aug 31, 2022, 10:22:54  
[View Abatement Options](#) [Ignore](#)

**Storage Tank**  
ID: 0938749357

Total Emissions (CO2eq)	Time since active (Hrs)
<b>185.41</b>	<b>00:10:54</b>

**Observations**

Jul 19, 2022 16:10	Leak Rate
<b>Satellite</b>	<b>600 kg/h</b>
Aug 31, 2022 10:32	Leak Rate
<b>IoT</b>	<b>550 kg/h</b>

**Details**

Status:	<b>Active</b>
Type:	<b>Fugitive</b>
Location:	40.0487567, 61.0477567
Detected on:	Aug 31, 2022 10:32
Closed on:	Select Date/Time
Duration of Inspection (Hrs):	- : -
Quantification Method:	OGI
Gas Leak Rate (kg/h):	320
CH4 Emission Rate (kg/h):	110
Gas Composition:	Enter gas composition

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# Cost-Effective Methane Reduction Strategies

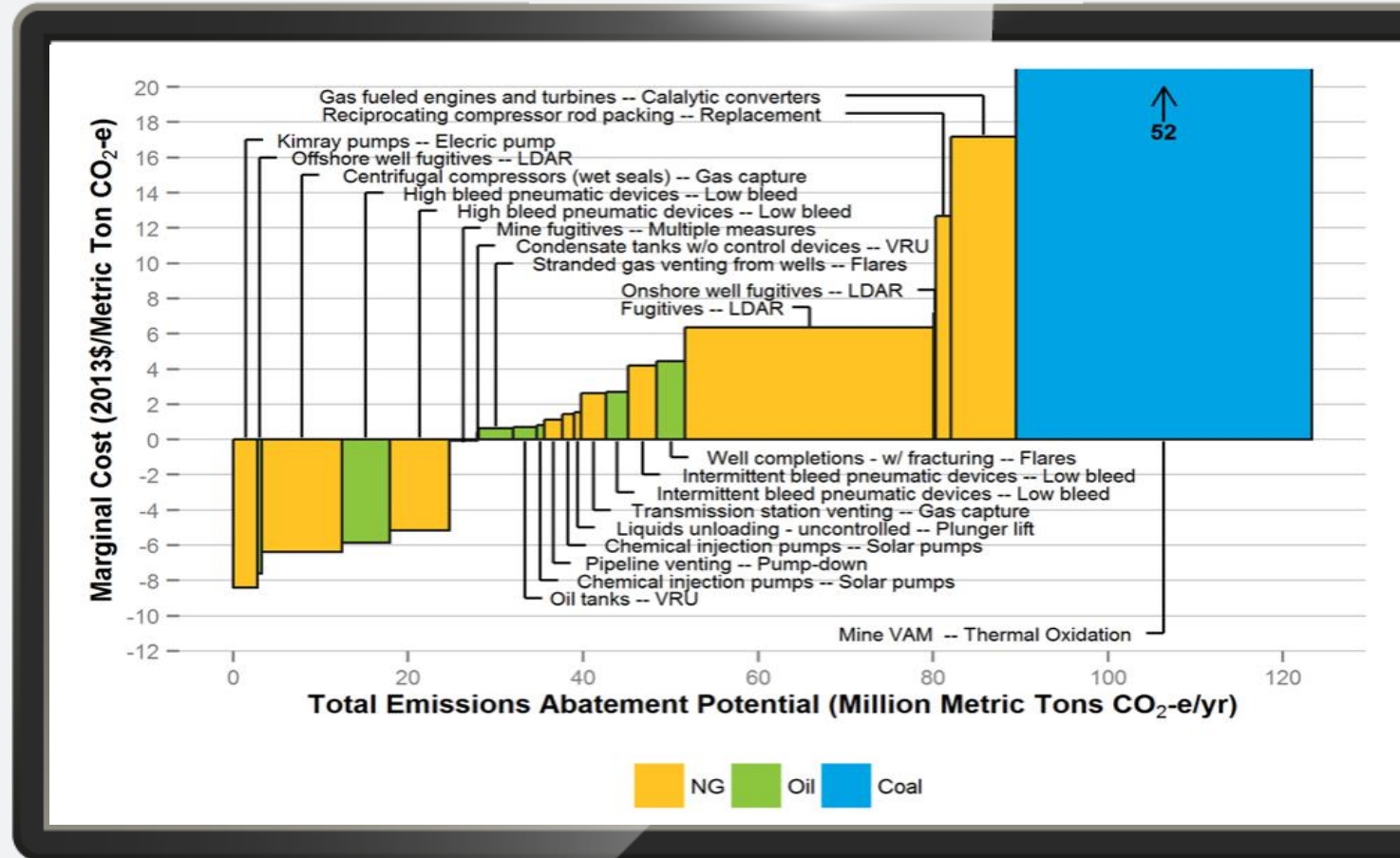
Fastest Root to Reduction

Cost Sensitivity

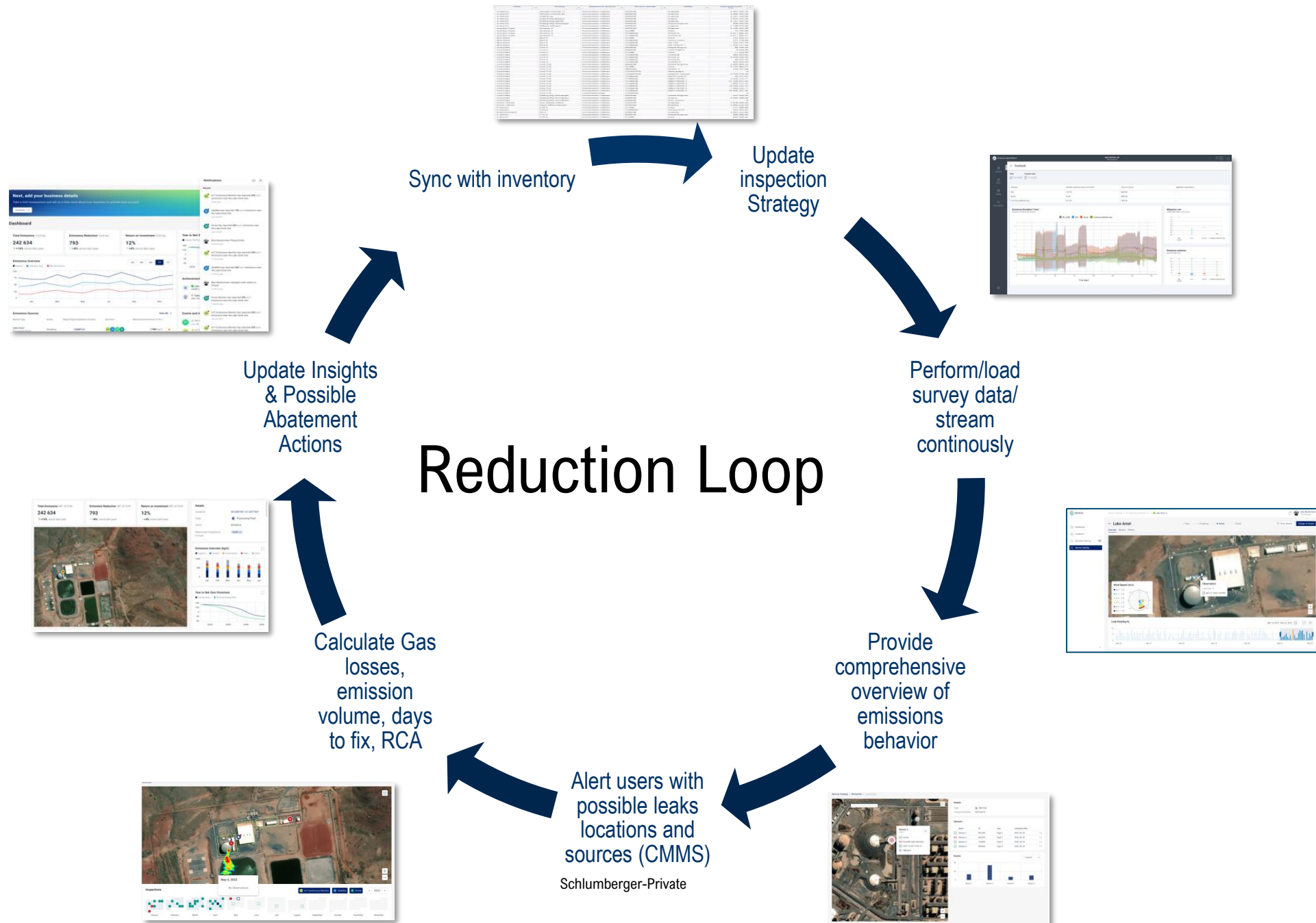
Total Methane Reduction

Regulatory Compliance

Gas Savings



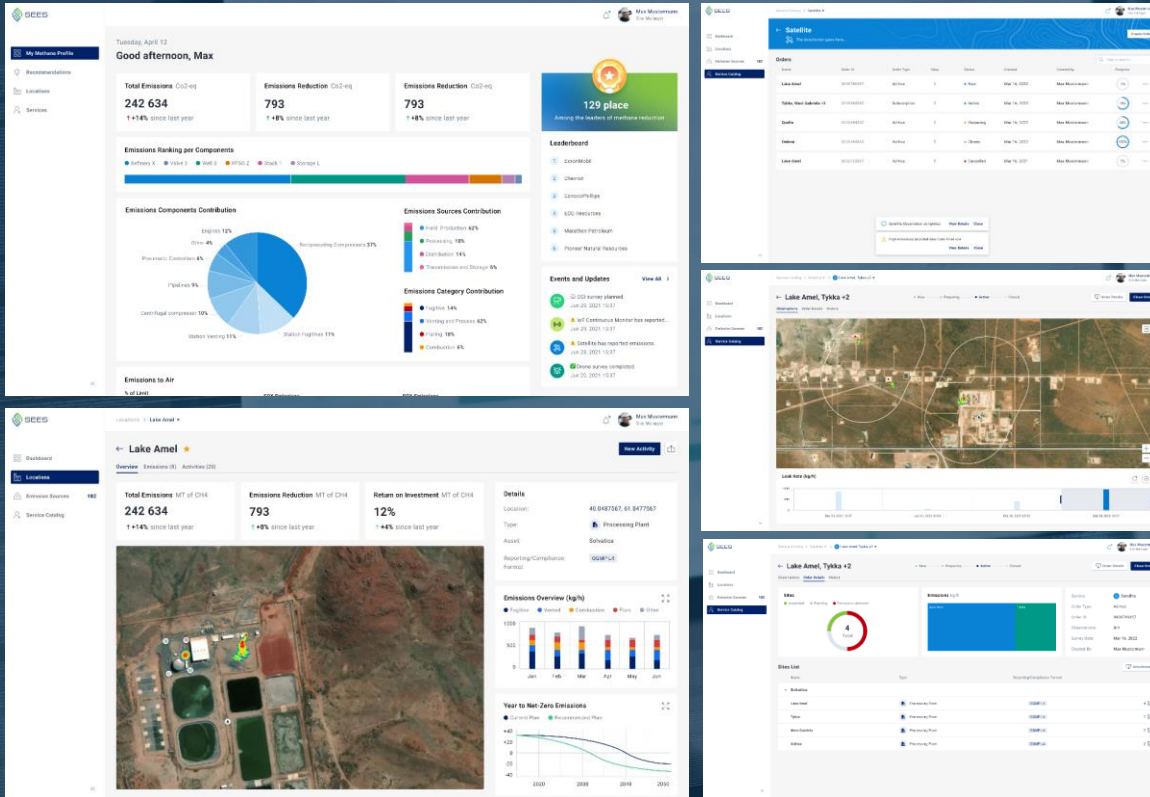
Sources: EPA, Abatement Cost Curves







# Questions ?



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