

# Managing Methane Emissions

## Design for Industry 4.0

Building Sustainable Digital Enterprises

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# Methane Emissions - Oil & Gas Value Chain

Source: ICF, Methane Emissions from the Oil and Gas Industry: "Making Sense of the Noise," 2015



## **PRODUCTION (46% EMISSIONS)**

Well pads leaks, pneumatic devices, storage tanks, flaring, unloading liquids from wells, compressors, dehydrators

## **PROCESSING (11% EMISSIONS)**

Emissions from gathering and processing centers - Dehydrators, compressors, pneumatic devices and flaring

## **TRANSMISSION & STORAGE (27% EMISSIONS)**

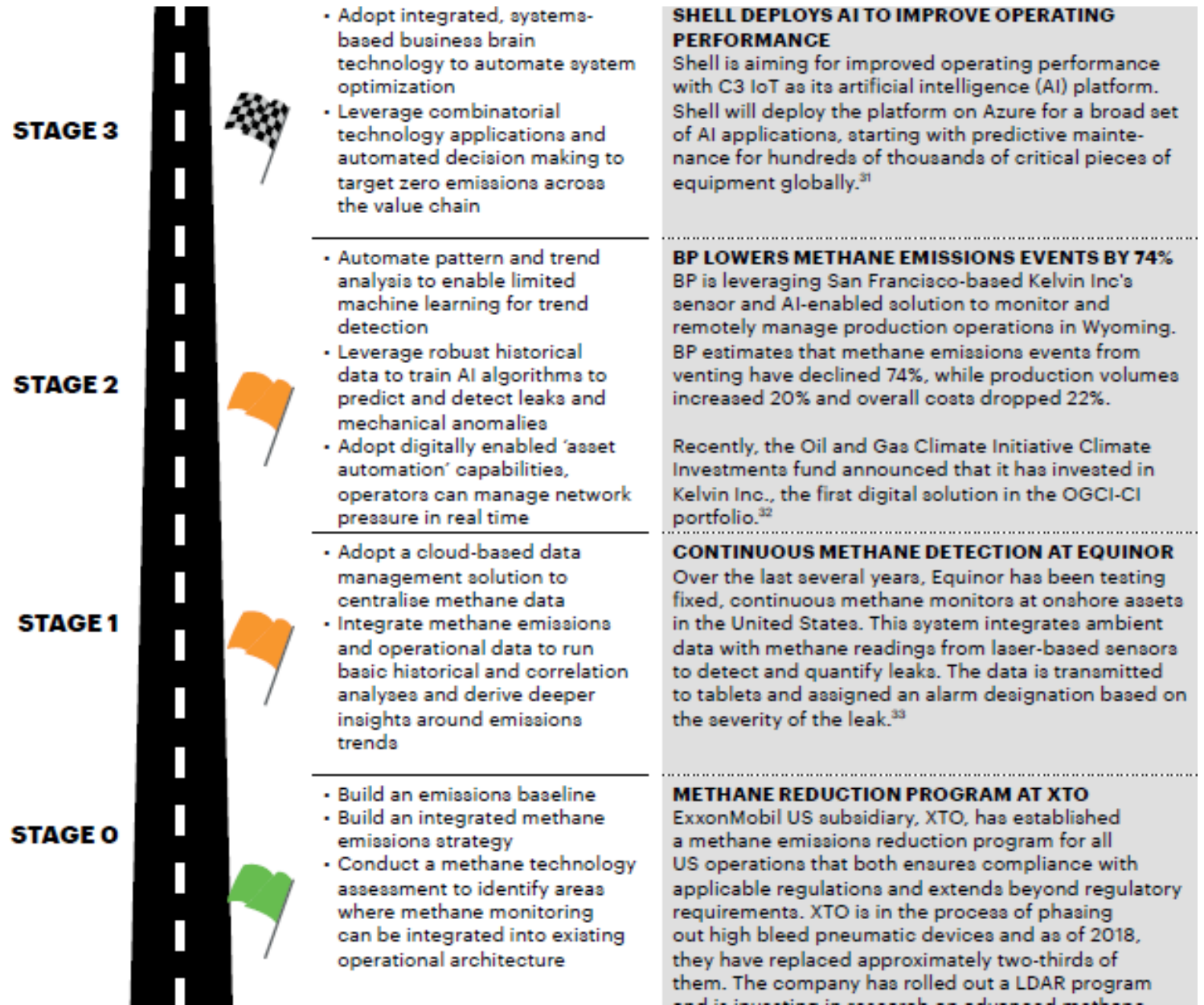
Underground storage facilities, compressor venting and leaks, transmission compressors leaks, pneumatic devices and compressors

## **DISTRIBUTION (16% EMISSIONS)**

Above ground & below ground pipelines delivering the final product

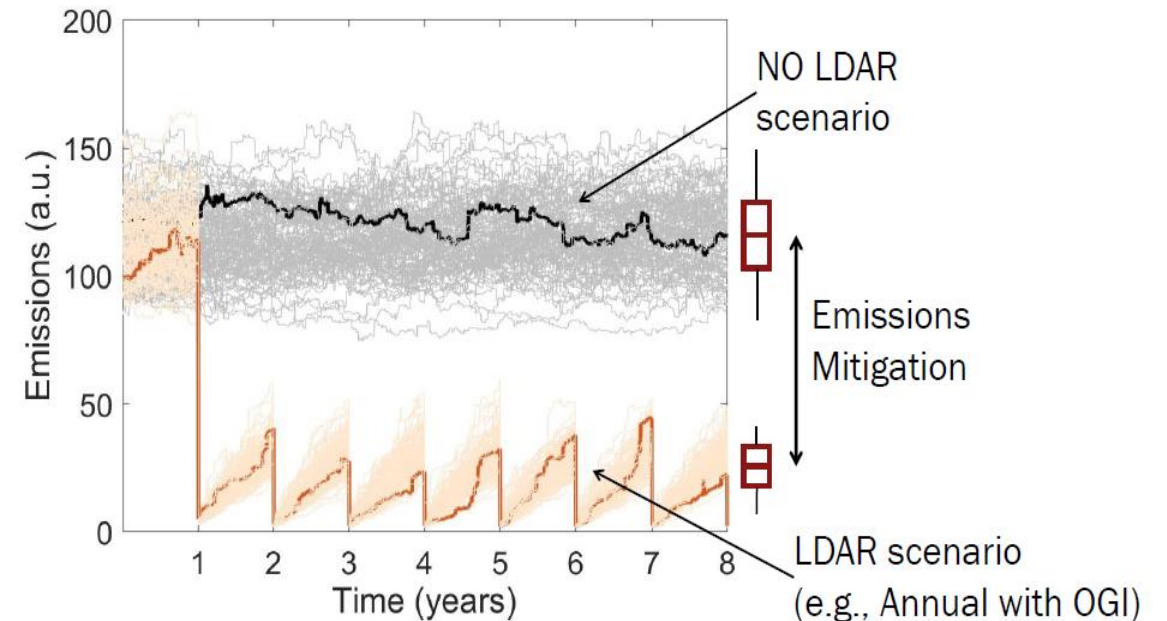
# Oil & Gas industry adoption of Methane Emissions

Source: Environmental Defense Fund (EDF) with Accenture Strategy on Digital Methane Future



- Methane leak hotspots detection through Satellite Images (from the oil fields)
- Pinpoint Methane leak location and identify the cause of the leak
- Estimate emission size and impact from Methane leaks and emissions
- Simulating effectiveness of methane leak detection programs
- Support in ESG Reporting through digital platforms

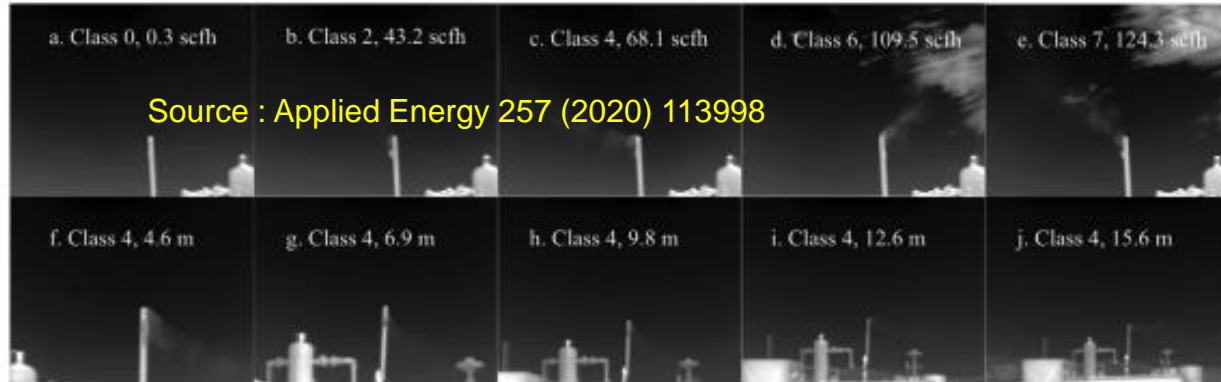
FEAST (Fugitive Emissions Abatement Simulation Toolkit) uses Monte Carlo simulations to estimate the range of methane emissions at a group of facilities under various emissions reduction scenarios



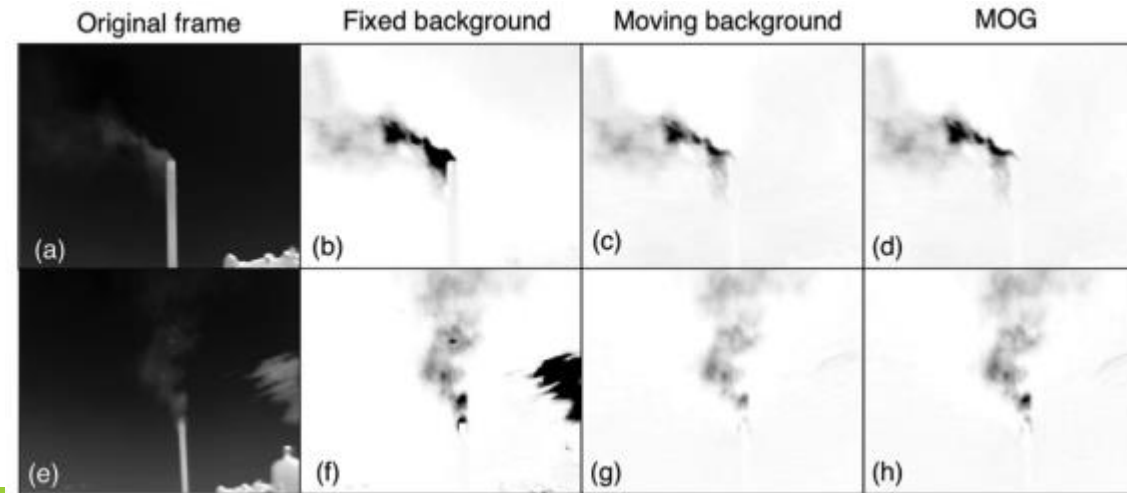
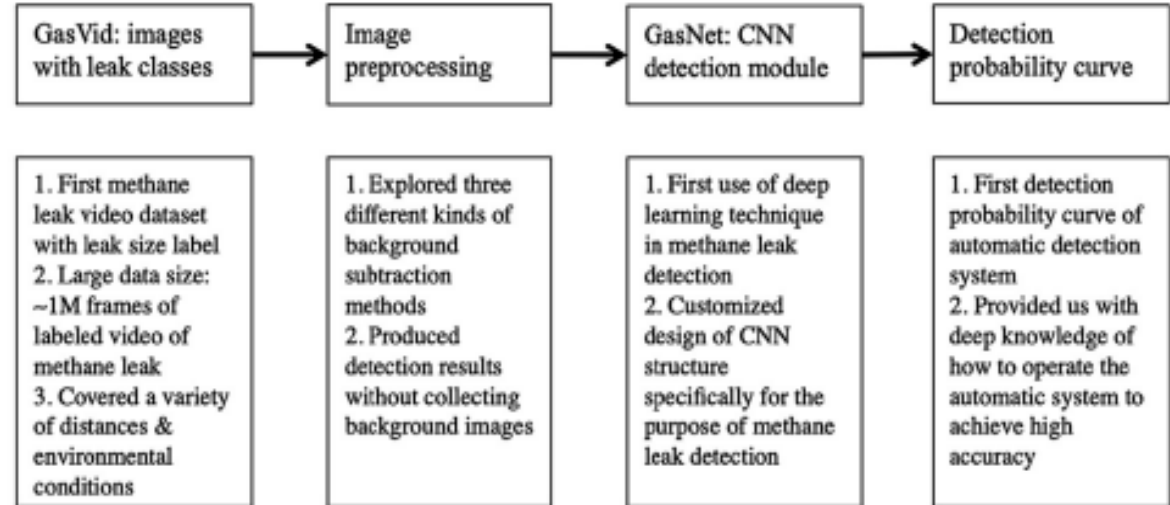
\* Leak Detection and Repair (LDAR)  
Optical Gas Imaging (OGI)



# Methane Emissions Detection - Computer Vision



## Key process



# Methane Metrics - ESG Reporting Compliance

METRIC	DESCRIPTION	WHY IT'S IMPORTANT	HOW/WHERE TO REPORT				LEADING COMPANY EXAMPLES
			SUSTAINABILITY REPORT			US 10-K FILING	
			CDP	GRI	IPEICA	SASB	
<b>EMISSIONS RATE</b>	Methane Emissions/ Gas Production (or throughput) <sup>19</sup>	Enables comparison of company performance over time, and comparisons in methane performance between companies.	OG 7.5	SRS 505-4, page 21 line 412	E1-C3, page 45	NR0101-01 and NR0102-01	Marathon Oil, Chevron, and EOG report a methane emissions rate.
<b>EMISSIONS REDUCTION TARGET</b>	Quantitative, time-bound target to reduce emissions.	Targets signal importance of issue, and drive management and staff performance.	OG 7.7	SRS 302-2-c-iii, page 12 line 144	N/A	N/A	Southwestern Energy reports a goal of keeping methane emissions below 0.36 percent of production.
<b>LEAK DETECTION AND REPAIR (LDAR) PROTOCOL</b>	Frequency, scope (% of assets covered), and methodology (i.e. type of equipment used) of LDAR program.	LDAR is the most important operational practice to identify and fix accidental leaks, and all three aspects drive effectiveness.	OG 7.3	SRS 301-2-c-iii, page 12 line 144	N/A	NR0101-03 and NR0102-02	Southwestern Energy reports conducting LDAR at least once a year on 88% of total well count using an OGI/FLIR camera.
<b>METHANE POLICY POSITION</b>	Company position on the role of regulation to limit industry emissions and how this position differs from that of trade associations and other third party organizations to which the company is a member.	Leading corporate actors not only have best-in-class operations to limit emissions, but also support policies which reduce reputational and product risk for the whole industry.	N/A	SRS 615-1.2, page 10 line 102	SE14-01, page 124	NR0101-25	Statoil has disclosed a public policy position on methane regulations to "support with minor exceptions." <sup>20</sup>

BEGINNER	INTERMEDIATE	EXPERT
<ul style="list-style-type: none"> <li>• Reports on one of the methane metrics</li> <li>• Reports methane emissions data separate from other GHGs.</li> <li>• No methane reduction target or firm plans to set one.</li> <li>• Does not support shareholder resolutions seeking improved methane disclosure.</li> </ul>	<ul style="list-style-type: none"> <li>• Reports against 2-3 methane metrics.</li> <li>• Uses best management practice quantitative target, (e.g. conducting LDAR on a % of assets, reducing methane leaks incidence rate per inspection, improve frequency of LDAR)</li> <li>• Neutral stance on methane disclosure resolutions.</li> </ul>	<ul style="list-style-type: none"> <li>• Reports against all the above metrics.</li> <li>• Reported information is audited by third-party.</li> <li>• Transparently reports progress against public methane reduction targets.</li> <li>• Supports appropriate methane disclosure shareholder resolutions, if applicable.</li> </ul>





Applied Analytics for Digital Enterprises

# Thank You

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