The application of miniaturised methane sensors and drone technology for accurate identification and quantification of emissions

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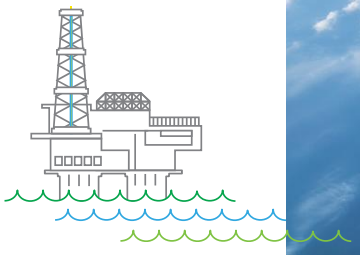
Why Methane Matters

Methane has a shorter lifespan in the atmosphere than CO_2 and it has higher global warming potential if it finds its way into the atmosphere before it's burned.

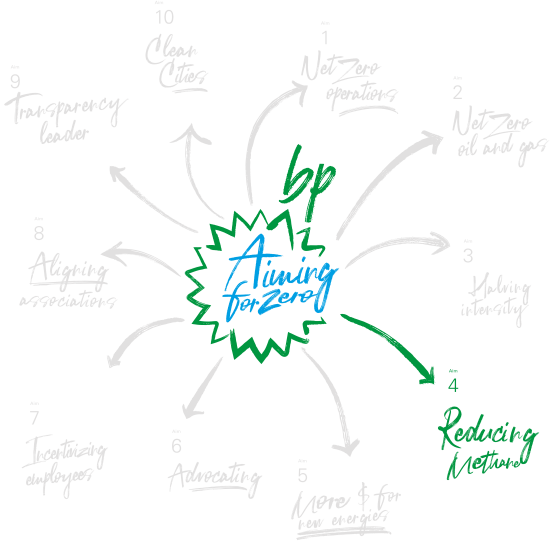
That potential is estimated to be at least

25 times

that of CO_2 over 100 years



Aims and Initiatives



Is to install methane measurement at our major oil and gas processing sites by 2023, publish the data, and then drive a 50% reduction in methane intensity in our operations.
And we will work to influence our joint ventures to set their own methane intensity targets of 0.2%.

OGMP2.0, 2020:

~30% global oil and gas production
>60 companies
Full value chain

COP26 Methane Pledge, 2021:

30% Reduction in methane emissions from all sources by 2030

OGCI, 2022:

'Aiming for Zero Methane Emissions' by 2030

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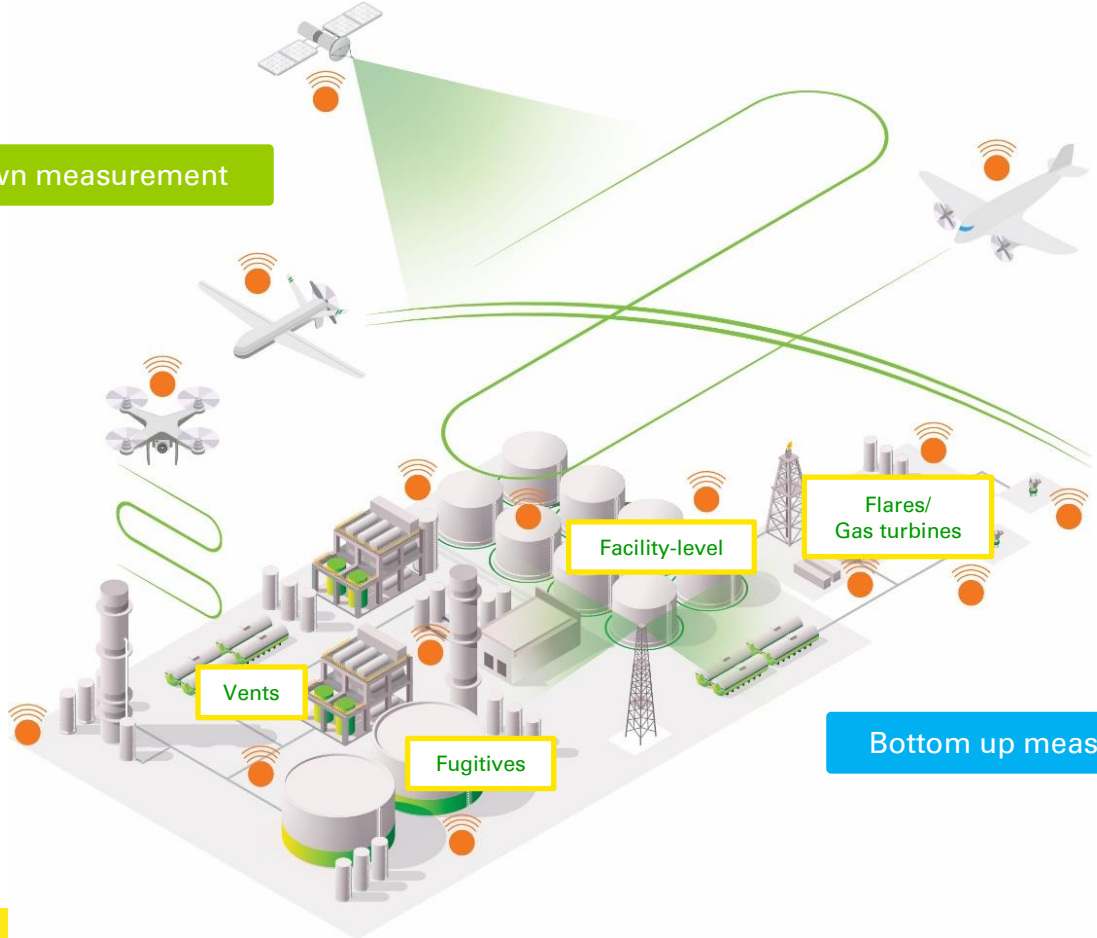
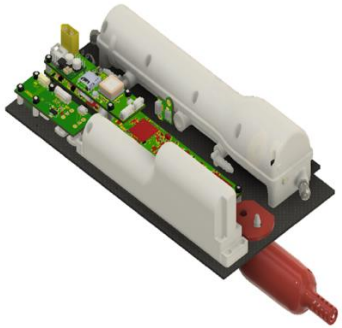
Types of measurement – ‘bottom up’ and ‘top down’

Top down measurement

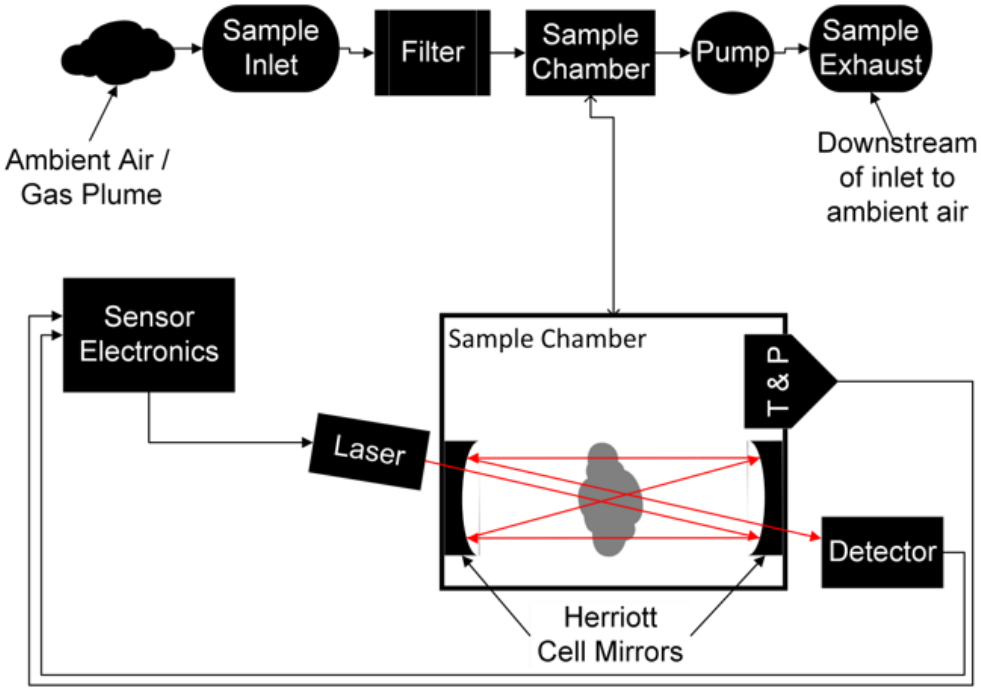


Bottom up measurement

Fundamentals of TLDAS

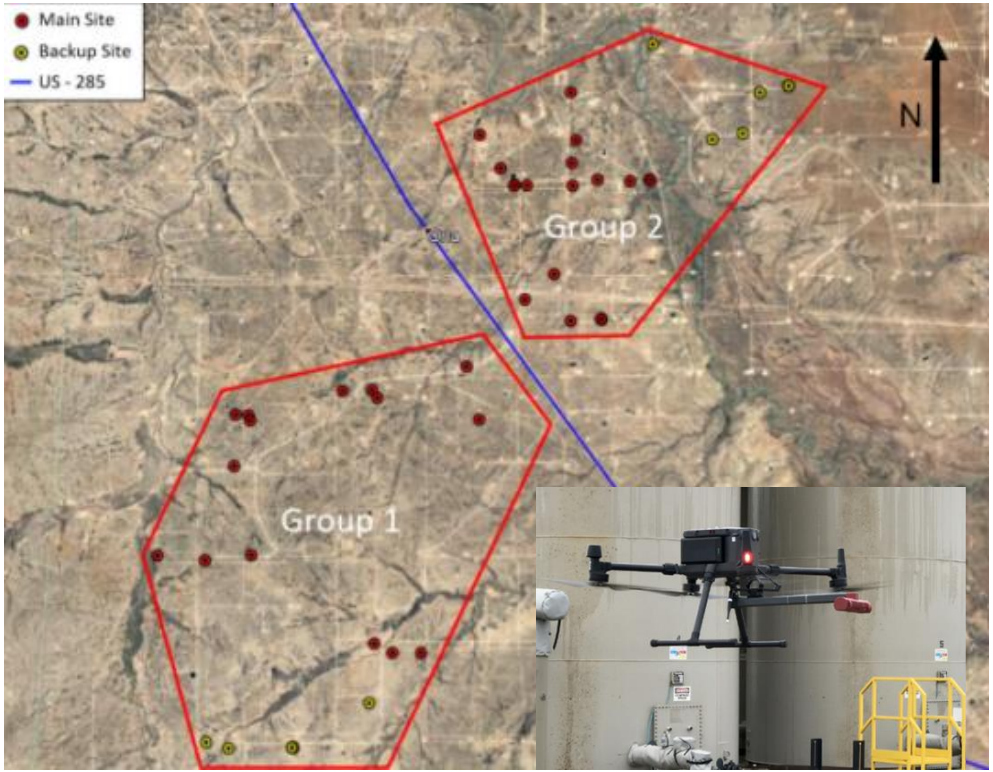


	Fixed-wing Payload 2021 Sensor
Weight	0.85kg
Minimum Detection Limit	164ppb methane @ 1s 2.5kg/h methane @ 250m 10kg/h methane @ 500m
Response Time	~0.7s
Battery Life	10h
Data Rate	10Hz logged 0.05Hz telemetry stream



Leak Detection and Repair

Onshore US - 2020



Permian Basin, Texas 25 sites, 2 days

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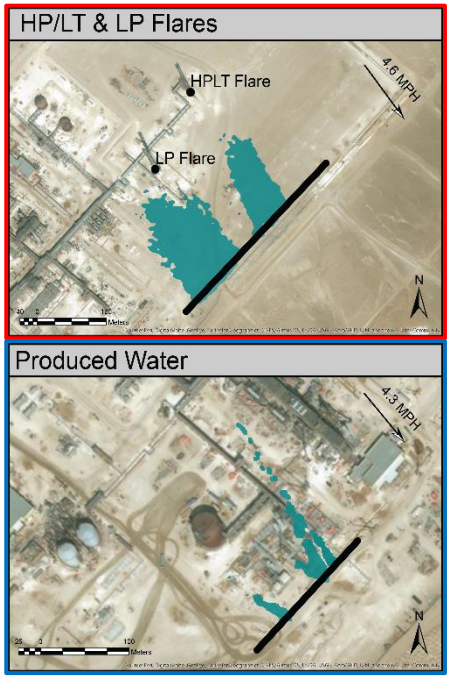
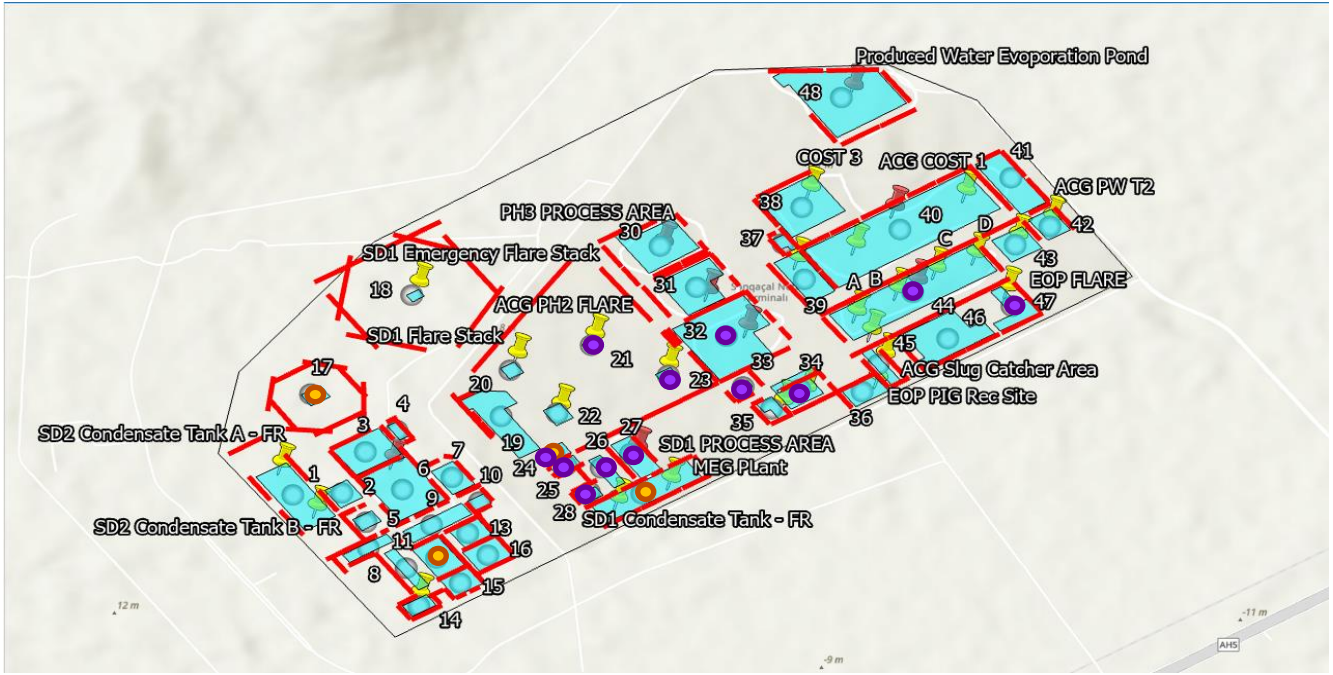
Onshore surveys: Complex emissions: Flares, Engines, Produced water



Oman Khazzan - 2018



Azerbaijan Sangachal - 2021

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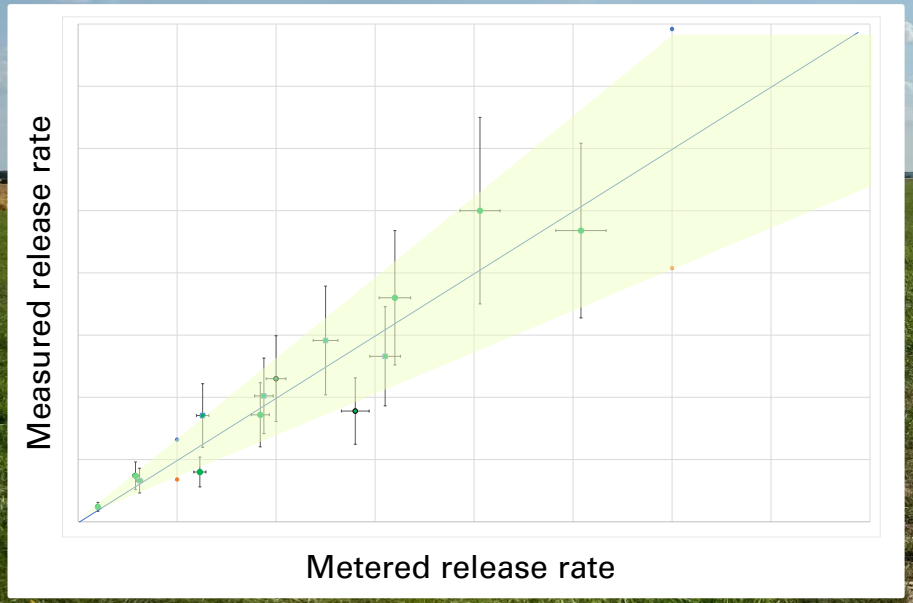
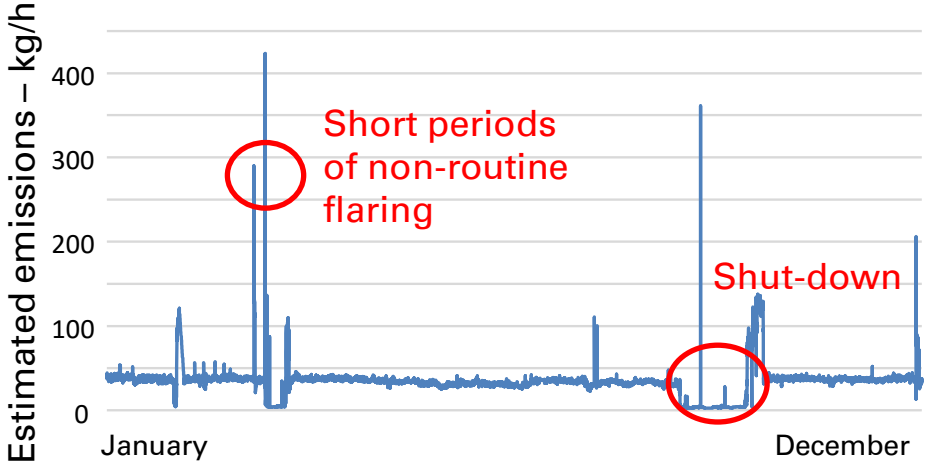
Going beyond the horizon: Offshore Verification

Controlled releases: The pathway to accredited measurements

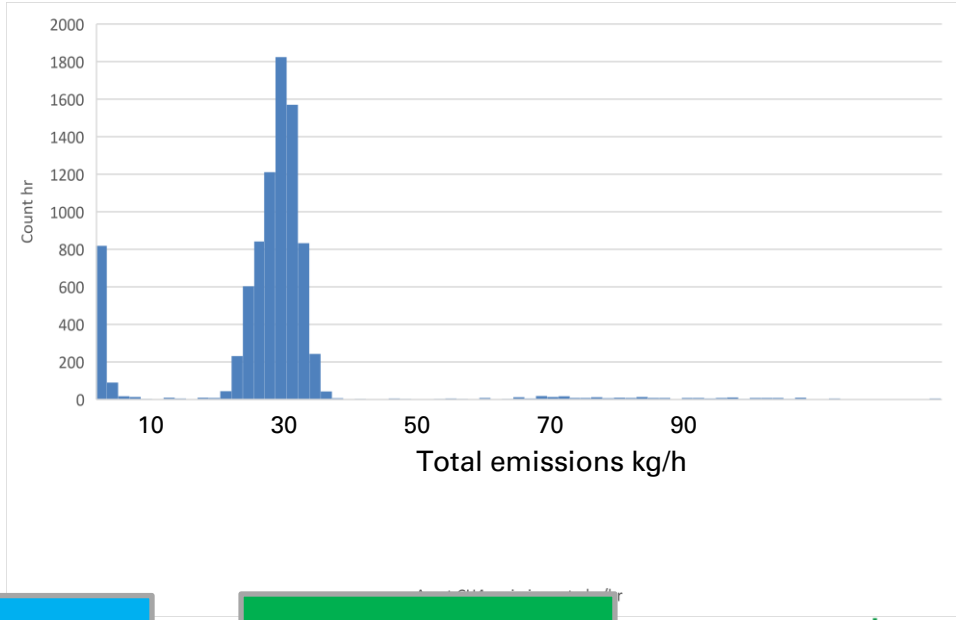


Offshore verification

Typical activity profile



Frequency (1 hr resolution)



Flare – 83%			+	Fuel Gas – 10%		+	Fugitives – 7%
Ultrasonic flow meter	Episodic composition	98% DE		Flow meter	Emission factor		Emission factor

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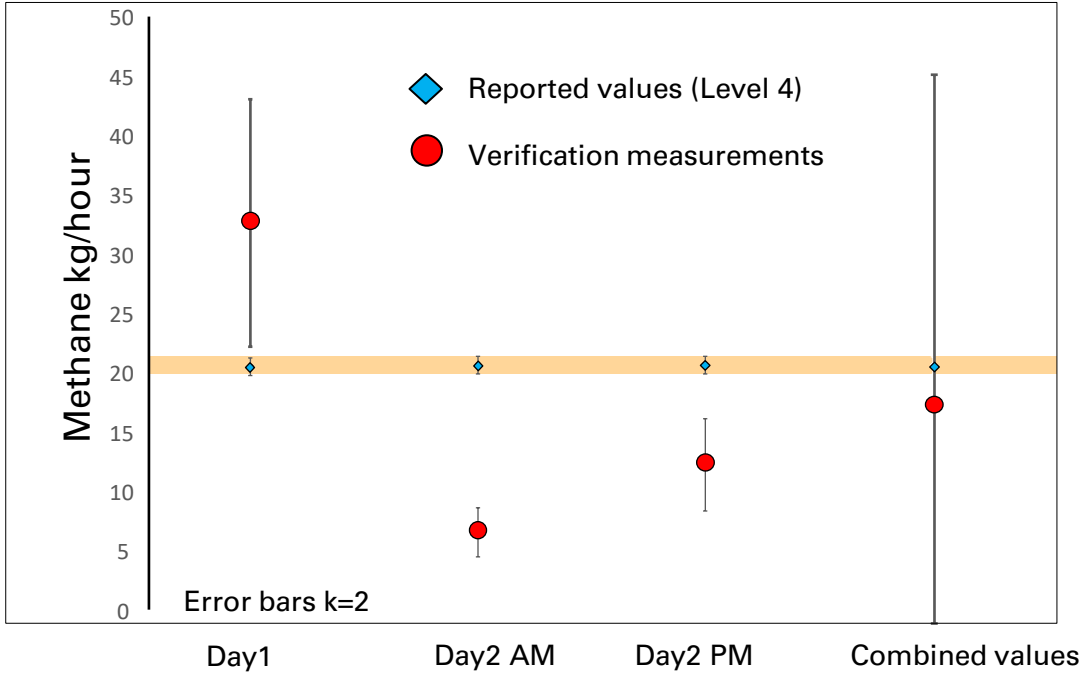
Verification measurements and Level-5 Comparison



Q&A