Methane Masterclass: APA's Methane Measurement Journey

20 May 2024

Acknowledgement of Country

At APA, we acknowledge the Traditional Owners and Custodians of the lands on which we live and work throughout Australia.

We acknowledge their connections to land, sea and community.

We pay our respects to their Elders past and present, and commit to ensuring APA operates in a fair and ethical manner that respects First Nations peoples' rights and interests.

APA is Australia's leading ASX-listed energy infrastructure operator and developer

ASX listed

- $27bn portfolio of assets[1]
- Market cap of $11bn[2]
- EBITDA of $1.7bn in FY23

Gas infrastructure

- >15,000 km transmission pipelines[3]
- 12,000 tonnes LNG and 18 PJ of gas storage
- 29,500 km gas mains and pipelines and >1.5 million gas customers[4]

Power generation[3]

- 342 MW Wind
- 311 MW Solar
- 39 MW BESS
- 884 MW gas fired generation

Electricity infrastructure

- >800 km high voltage electricity transmission[3]
- 290 km deep-sea electricity cable

1. Total assets under management as of 1H24
2. $10.97bn as of 7 May 2024
3. Includes 100% of assets operated and/or under construction by APA Group, which form part of Energy Investments segment, including SEA Gas, EII and EII2 (each partially owned)
4. Includes 100% of assets operated by APA Group in Queensland, New South Wales, Victoria and South Australia

Our Climate Transition Plan

GOAL: **Gas infrastructure** – net zero operational emissions by 2050[1]

GOAL: **Power generation and electricity transmission infrastructure –** net zero operational emissions[2] by 2040[3]

INTERIM TARGETS / GOALS FOR 2030

TARGET:	30% emissions reduction for gas infrastructure (FY21 base year)	**GOAL:**	35% reduction in emissions intensity for power generation (FY21 base year)
TARGET:	100% renewable electricity procurement from FY23 onwards	**GOAL:**	Contribute positively to grid decarbonisation measured by MW of enabled renewable infrastructure
GOAL:	100% zero direct emission fleet	**SUPPORTING ACTIONS:**	Active program to reduce emissions we can control and apply best practice management techniques to managing line losses
SUPPORTING ACTIONS:	Responsible criteria[4] applied when offsets are required		

NEW TARGET FOR 2030

TARGET: 30% methane reduction target (FY21 base year)

TOTAL NOMINAL EXPENDITURE TO 2030

Approximately $150M–$170M

INVESTMENT

Growth capital investment

KEY SUPPORTING ACTIONS

1. Incorporation of the Methane Guiding Principles
2. Hold a non-binding securityholder vote on future material updates to our Climate Transition Plan
3. Report annually on progress against the targets, goals and commitments in our Climate Transition Plan
4. Link executive remuneration to climate-related performance from FY23
5. Scope 3 emissions goal to be finalised before or in conjunction with our next Climate Transition Plan

When setting APA's targets and goals, we made our commitments clear to stakeholders based on the level of uncertainty in the pathway required to reach them:

Target: an intended outcome where we have identified one or more pathways for delivering that outcome, subject to certain assumptions or conditions.

Goal: an ambition to seek an outcome for which there is no current pathway but for which efforts will be pursued towards addressing that challenge, subject to certain assumptions or conditions.

Climate Report 2023

FY23 Climate Data Book

FY23 Greenhouse Gas Emissions and Energy Calculation Methodology

[1] Includes transmission, distribution, gas processing, storage and corporate.
[2] The organisational boundary for all targets and goals relates to assets under APA's operational control, as defined by the Greenhouse Gas (GHG) Protocol. The following assets are not within APA's operational control for emissions reporting purposes: Victorian Transmission System (maintenance excepted), Gruyere and X41 Power Stations, Wallumbilla Gladstone Pipeline, SEA Gas Pipeline and Mortlake Pipeline, North Brown Hill Wind Farm and Australian Gas Networks.
[3] Includes power generation and interconnectors.
[4] This means the application of our Offset Criteria when offsets are required.

APA's methane measurement journey so far…

FY22

- Released Climate Transition Plan (Aug 2022) with commitment to establish methane target and enhanced methane measurement approach
- Signatory to the Methane Guiding Principles
- Methane reporting at NGER method 1 level

FY23

- OGMP consultant desktop study to identify the implications of aligning with OGMP 2.0
- Goldfields Gas Pipeline (GGP) - ground level measurement campaign
- Fixed wing aerial survey of the GGP, Moomba Sydney Pipeline (MSP) and South-West Queensland Pipeline with US based technology provider

Image: Service provider setting up its patented methane imaging technology onboard the aircraft

FY24

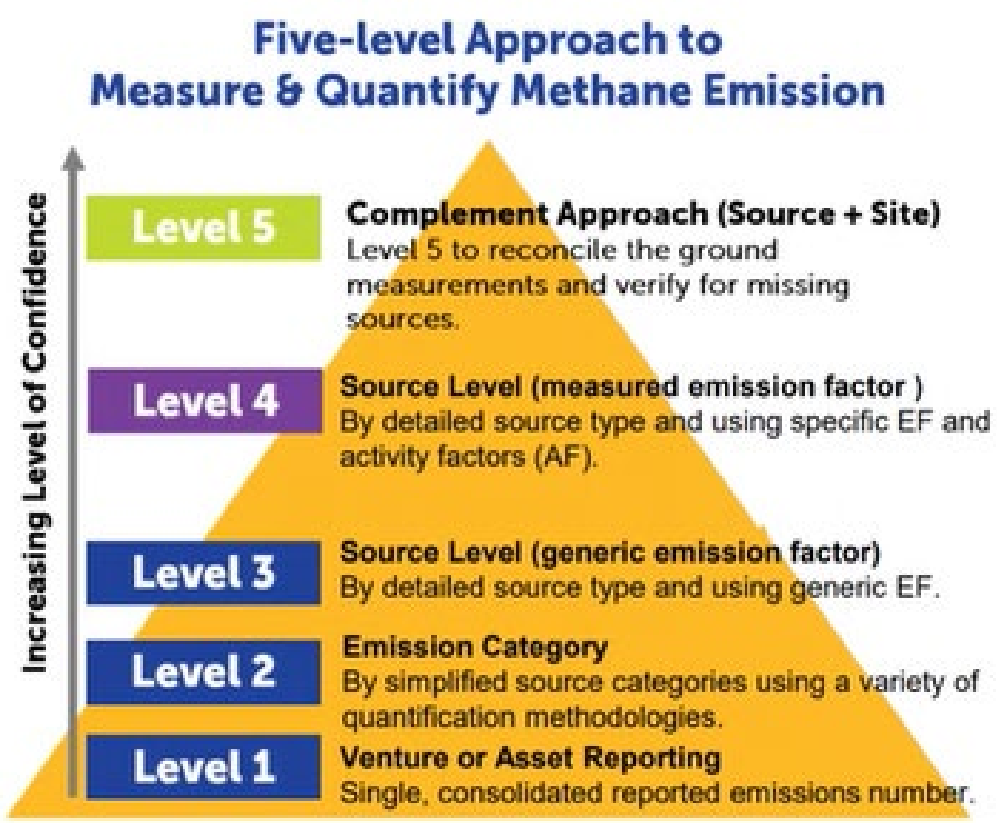
- Climate Report released (Sept 2023) with methane target announced
- Commenced full OGMP 2.0 pilot on our South-West Queensland Pipeline
  - Ground level measurement campaign
  - Helicopter aerial survey with US based technology provider

The Oil & Gas Methane Partnership 2.0 (OGMP 2.0) is the United Nations Environment Programme's methane reporting framework

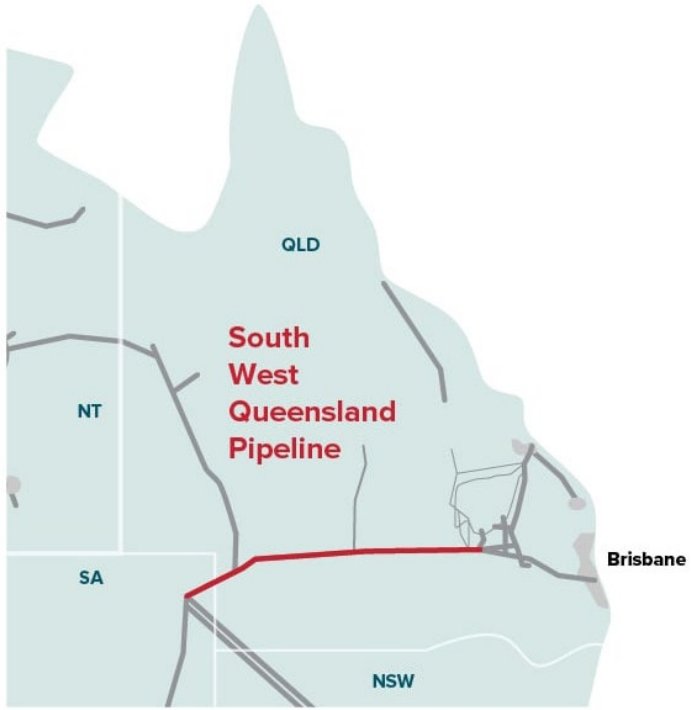
Standardises a rigorous and transparent emissions accounting practice allowing operators to accurately understand and characterise methane emissions to inform mitigation strategies and performance against targets

Companies progress along the reporting framework, increasing the accuracy of reported emissions with each level moving from asset level reporting to detailed source types with generic emission factors to specific emission factors using direct measurement (level 4 and 5)

Gold Standard reporting is achieved once companies empirically reconcile measurements at source (Level 4) and site (Level 5) level for the vast majority of their assets



South-West Queensland Pipeline - OGMP 2.0 pilot bottom-up measurements



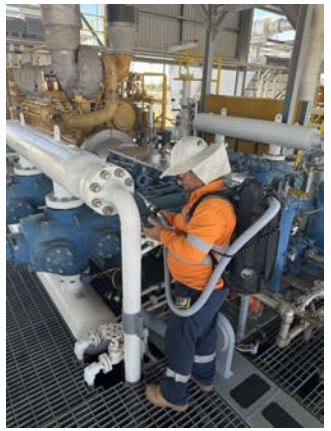
South-West Queensland Pipeline

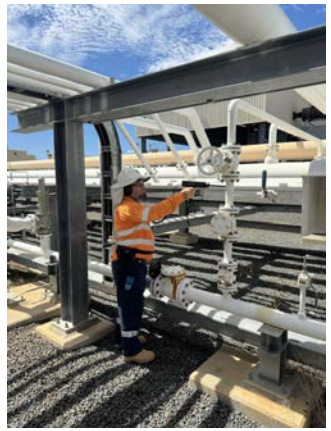
- Bi-directional 937km transmission pipeline
- Two parallel pipelines (400mm and 450mm diameter)
- Compression facilities at Moomba and Wallumbilla hubs

OGMP 2.0 Pilot – Level 4 "bottom up"

- ✓ Fugitive and equipment leak emission rates calculated based on Flame Ionization Detector (FID) ppm readings using US Environmental Protection Agency (USEPA) correlation
- ✓ **Direct emission measurements** with High Flow Sampler (HFS) or Quantitative Optical Gas Imaging (QOGI) measurement for emission estimation
- ✓ **Circa 20,000 potential emission sources** assessed via direct measurement or engineering calculations
- ✓ **Leak Detection and Repair (LDAR) database** developed which is fundamental to methane emissions inventory

Measurements





Sources

6 compressor stations
5 scraper stations
4 offtake sites
12 main line valve sites

LDAR

- **Emissions captured at component level**, leveraging internal asset information databases.
- Leaks categorised per APA's Leak Management Protocol.
- **Immediate repair of leaks >500ppm**, where feasible.
- Tagging and scheduling of non-repairable leaks.

South-West Queensland Pipeline - OGMP 2.0 pilot top-down measurements

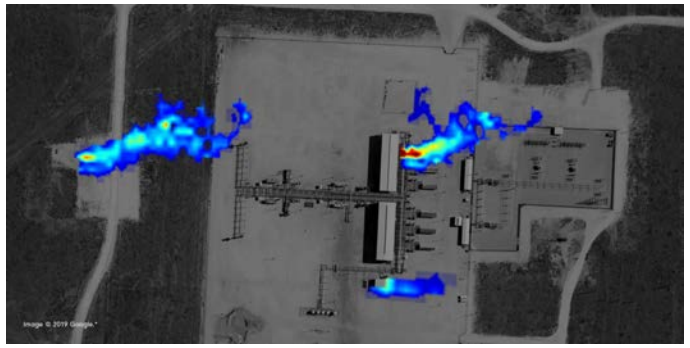
Helicopter aerial surveys "top down"

Source: Bridger Photonics

Source: Bridger Photonics

OGMP 2.0 Pilot – Level 5 Reconciliation

- ✓ Level 5 is the reconciliation of source-level inventories (Level 4) with independent site-level measurements
- ✓ Gas mapping using **light detection and ranging (LiDAR) technology** to sensitively map methane sources from the air
- ✓ Generates geo-registered gas plume imagery, which, combined with advanced analytics, creates maps of precise methane leak locations and emissions rates
- ✓ Regulatory bodies e.g. US EPA increasing permitting leak detection with advanced technologies such as LiDAR Environmental Protection Agency (EPA)



Example emission. Source: Bridger Photonics

- 0.5 kg/hr target detection with > 90% probability of detection
- Accurately locates methane emissions with GPS coordinates and emission imaging

- Reconciliation expected to improve accuracy, thoroughness, and confidence in reported emissions
- Need to understand, report and address L4/L5 measurement discrepancies.

What is next on our methane measurement journey?

Use findings from OGMP 2.0 SWQP pilot to inform our thinking on enhanced methane measurement and reduction

Continue to advocate for sound policy and regulations on methane emissions directly and through Industry Associations to Government Departments. In particular:

- Methane measurement approach based on risk
- Affordability
- Availability of technology in Australia
- Availability of a skilled workforce
- Measurement system robustness (repeatability and reliability)


apa
Q&A