NITROUS OXIDE

FROM EMISSIONS LANDSCAPE TO INVESTABLE OPPORTUNITIES

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WHY N_2O MATTERS

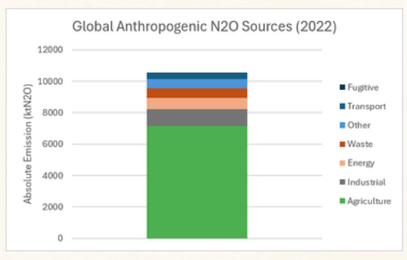
270x the 100-year warming potential of CO_2

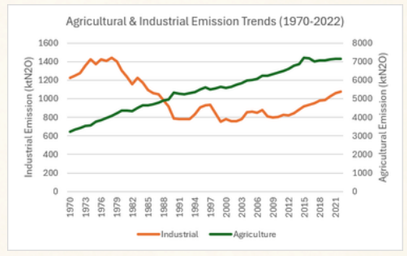
10% of net global warming since the Industrial Revolution

>100 years atmospheric lifetime

N_2O is a significant but under-addressed climate challenge with growing policy attention and substantial abatement potential

WHERE EMISSIONS COME FROM





Agriculture is the largest and fastest-growing source, while **industrial** emissions remain a concentrated and addressable opportunity

Previous emission management efforts have failed to curb the rise in agricultural emissions,representing **untapped abatement potential** and **structural challenges;** There is **continued demand** for industrial abatement solutions

Top emitters selected for deepdives:

*Top 10 countries account for **62%** of emissions; targeted interventions can deliver disproportionate impact*

TECHNOLOGIES AND ABATEMENT ECONOMICS

Industrial Abatement Technologies

- **Catalytic Reduction & Decomposition** – Uses catalysts to convert N_2O into harmless gases, achieving 80 - 99% abatement rate in nitric and adipic acid plants
- **Methane-Assisted Plasma Scrubbers** – Uses high-voltage plasma and methane injection to destroy N_2O, with over 90% abatement rate, while suppressing NO_x formation in semiconductor plants

Agricultural Abatement Technologies

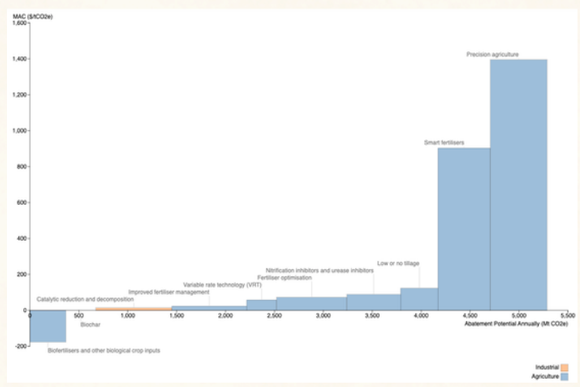
- **Fertiliser Technologies** – Modify fertilisers to inhibit nitrification and limit denitrification (e.g. nitrification and urease inhibitors, smart fertilisers)
- **Soil Technologies** – Additives to soil to improve soil properties and reduce N-fertiliser requirement (e.g. biochar, biofertilisers)
- **Digital Technologies** – Digital tools like GPS or sensors to optimise farming processes (e.g. precision/smart farming)

Emissions Monitoring

- **Direct Point-Source Measurement:** Monitoring conducted at industrial stacks using Continuous Emission Monitoring Systems (CEMS) to support precise Measurement, Reporting, and Verification (MRV)
- **Preferred Technologies:** FTIR (Fourier Transform Infrared) and NDIR (Non-dispersive infrared) analysers offers high accuracy for multi-gas monitoring and compliance with EU and US EPA standards

- **Estimation via Biogeochemical Models**: Agricultural emissions are diffused and biologically driven, making direct measurement difficult. Hence, they are estimated using process-based models
- **Key Monitoring Tools**: Leading models include DNDC (Denitrification–Decomposition), which simulates soil nitrogen cycles, and COMET-Farm/DayCent, which use management data to estimate farm-level GHG footprints

MACC



‘Low hanging fruit’ opportunities exist with low cost and sizeable abatement potential (e.g. catalytic reduction, biofertilisers, biochar)

Industrial abatement is highly cost effective, combining low cost with substantial abatement potential

Smart fertilisers and precision agriculture have sizeable abatement potential, but requires a policy push, or investment opportunities are likely to favour proven solutions in the near-term

POLICY AND MARKET CATALYSTS

COUNTRY	CATALYST	INVESTMENT ANGLE
	ETS expansion + Industrial N2O Action Plan	Industrial, long-term upside
	Voluntary crediting (CAR), precision-ag & superpollutant demand	Large market but decentralised. More economics-driven, not policy-driven
	Fertilizer/subsidy reform	Agriculture watchlist, high potential
	ABC+ Plan, Bioinsumos growth	Agriculture, needs de-risking
	NACAG rollout, ETS launching 2027	Best near-term industrial case
	Décret n° 2022-1654, Nitrates Directive, EU ETS €80/t	Credible, incremental, steady compliance-driven demand
	Nitrates Directive, ETS €80/t	Mature, steady compliance demand

Industrial policies are more mature, with ETS and compliance schemes already driving demand for abatement and monitoring

Agricultural policies are still lighter, but fertilizer reform, subsidy redesign, and soil-health programs are expanding

INVESTMENT OPPORTUNITIES AND RECOMMENDATIONS

Assessment Framework

We assessed investment opportunities across five dimensions:
- **Technology** – maturity, reduction potential, MRV credibility
- **Market Attractiveness** – TAM, growth runway, adoption, policy tailwinds
- **Competitive Position** – IP, market leadership, competitive advantage
- **Financial Attractiveness** – growth, profitability, cash flow, valuation
- **Investment Relevance &** Risks – N_2O exposure, regulatory risk, execution risk

Assessment Outcome

20 companies assessed across 5 investment themes → 6 top recommendations

Near-term core exposure	Medium–long-term growth	Cross-cutting enablers
Industrial abatement	**Agricultural solutions**	**Monitoring & MRV**
Mature technologies, measurable reductions and strong policy support	Larger addressable opportunity, but greater adoption and execution risks	Enables credible measurement, verification and scaling across both sectors

METHODOLOGY

Global emissions analysis, country carbon prices & policy assessment, technology and MACC comparison, and company screening across five N_2O investment themes

LIMITATIONS

Agricultural emission estimates vary across locations and methodologies, while financial disclosure is limited for many private and diversified companies

CONCLUSION

- **Industrial abatement offers the strongest near-term investment case:** mature technologies, measurable reductions and supportive carbon pricing drive adoption
- **Agricultural solutions provide larger long-term growth potential:** opportunity is broader, but adoption depends on farmer economics, policy support and operational integration
- **Policy developments will be the key market catalyst:** tighter regulation in major emitting markets, particularly China and India, could significantly expand demand
- **A balanced portfolio is recommended:** combine industrial abatement for near-term returns with agricultural solutions and monitoring technologies for longer-term growth