Policy pathways to advance Australia's biomethane sector: Lessons from Europe and North America

Hamish MacDonald,[1] Jennifer Yarnold,[2] Belinda Wade,[3] Jamin Wood,[1] Joe Lane[1]

1. The University of Queensland, Gas and Energy Transition Research Centre
2. CSIRO, Environment
3. The University of Queensland, Business School

Abstract

Despite its status as a proven and relatively simple decarbonisation technology, biomethane's uptake in Australia has been very low compared to other countries. This is largely due to the absence of a supportive regulatory and policy environment in Australia.

This project consisted of an overview of the current biomethane industry and policy in Australia, a review of biomethane policy and uptake in five comparator countries (Canada, Denmark, Italy, the United Kingdom, and the United States), and an analysis of the policy mechanisms most suitable for driving the widespread adoption of biomethane in Australia.

Research Context

Biomethane is a low-carbon, circular, and renewable drop-in replacement to fossil-based natural gas. It has the potential to reduce Australia's methane emissions, help to decarbonise gas networks and gas-reliant industries, and support national climate and waste diversion targets.

Almost all biomethane is produced via upgrading biogas from anaerobic digesters and landfills – a mature technology which has been implemented at scale in many regions. These include Europe and North America, which respectively have 1,500 and 300 biomethane facilities in operation and had at least 950 and 500 facilities in the pipeline as of 2023. In contrast, Jemena's Malabar plant in NSW is the only biomethane project in operation in Australia as of 2025.

The key reason for this difference in uptake is the cost gap between conventional natural gas and biomethane. While various geographical and input cost factors contribute towards this gap, research indicates that changes to Australian policy could drive the development of a substantial domestic biomethane industry.

Country	Key Incentives	Secondary Incentives	Biomethane production 2023 (total)	Biomethane production 2023 (per capita)	Number of biomethane facilities
Canada	Renewable gas obligation	Renewable transport fuel obligation, emissions trading scheme, carbon tax, capital grants, supportive feedstock regulations	~17 PJ	0.42 GJ	32 (2023)
Denmark	Feed-in tariffs	Capital grants, renewable transport fuel obligation, emissions trading scheme, carbon tax, supportive feedstock and digestate regulations	26.74 PJ	4.51 GJ	59 (2024)
Italy	Capital grants, feed-in tariff/premium	Renewable transport fuel obligation, emissions trading scheme	27.95 PJ	0.45 GJ	133 (2024)
United Kingdom	Feed-in tariffs	Capital grants, emissions trading scheme, supportive feedstock and digestate regulations	27.11 PJ	0.40 GJ	119 (2024)
United States	Renewable transport fuel obligations	Capital grants, tax credits, emissions trading scheme, supportive feedstock regulations	114.4 PJ	0.34 GJ	305 (2023)

Figure 1: Summary of biomethane incentives and annual production in comparator countries

Methodology and Framework

Guided by a policy analysis framework, we mapped the key policy strategies, targets, market and financial instruments, and regulations along the supply chain for Australia, and for each each comparator country (**Figure 1**). These were broadly separated into demand-side instruments (carbon taxes, compliance markets) and supply-side instruments (grants, tariffs, and loans) (**Figure 2**). In addition to instruments specifically designed to incentivise biomethane production, we also investigated the effect of relevant environmental, waste, and gas distribution regulations.

The desktop review was complemented by interviews with industry, government and research stakeholders from Australia and comparator countries to further identify enablers, barriers, gaps and opportunities, and to better understand which policy mechanisms could be effectively implemented in Australia.

Findings

In the European countries we examined (UK, Denmark, Italy), the development of biomethane has largely been driven by supply-side financial instruments and investments that incentivise and support biomethane production. Initially, each country introduced schemes which included government-guaranteed feed-in tariffs based on the amount of biomethane produced, as well as supports for capital costs. As biomethane markets are now maturing in Denmark and the UK, earlier generous feed-in tariffs are being replaced by more competitive tendering processes and reverse auctions and/or feed-in premiums / contracts-for-difference.

In contrast, the US and Canada have employed demand-side regulatory instruments as their main mechanisms, particularly compliance markets. These incrementally-increasing obligations ensure long-term demand, which provide certainty for project developers and investors.

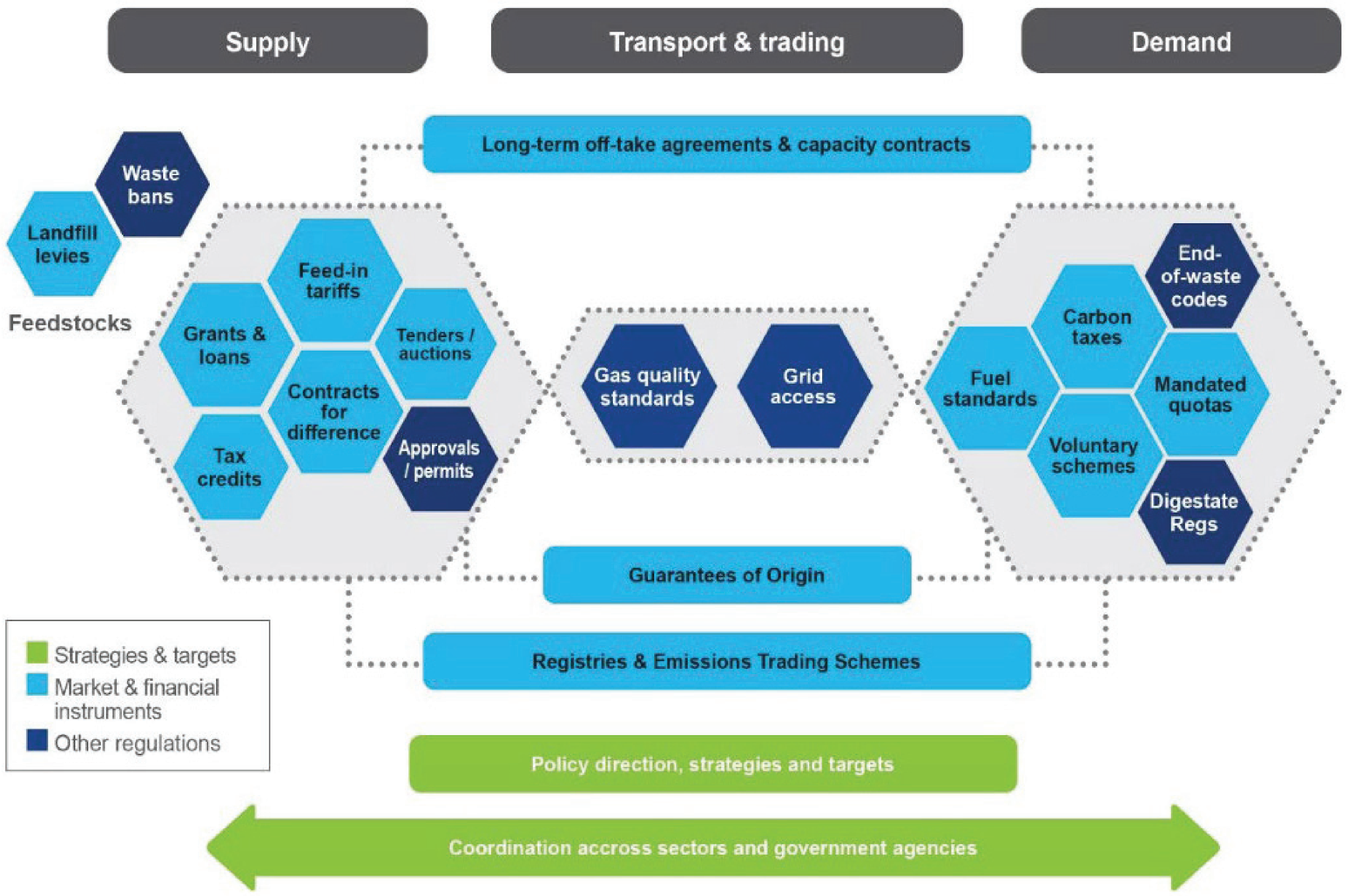

Figure 2: Categorisation of policy instruments

Conclusions

1. Australia's current policy mix can enable viable biomethane projects to be developed now, but broader adoption will require additional policy levers.
2. For large-scale adoption to take place, biomethane must be broadly accepted as a decarbonisation solution by government, industry, and the public.
3. There is no single ideal policy for stimulating biomethane, although a demand-side mechanism may be the most politically viable option, given the current momentum for a renewable gas target in Victoria and the ongoing development of a Renewable Gas Guarantee of Origin. Whichever incentive is selected, guaranteed long-term stability and carefully calibrated targets are crucially important.
4. Enabling regulatory frameworks can play a valuable supporting role in closing the price gap between natural gas and biomethane. Examples include:
   - Incentivising feedstock availability, such as banning or discouraging the burning of cereal stubble or the venting of waste methane emissions
   - Allowing the sale of co-products, such as by classifying digestate as a valuable product rather than a waste
   - Enabling new biomethane projects to connect to the gas grid
   - Increase the speed of permitting and approvals for new biomethane projects

h.macdonald1

University of Queensland

Acknowledgements

Thanks are due to Benjy Lee, for his support and guidance throughout this project.

The full report is available at https://www.futurefuelscrc.com/wp-content/uploads/RP2.2-05-Policy-pathways-to-advance-Australias-biomethane-sector.pdf

THE UNIVERSITY OF QUEENSLAND AUSTRALIA

CREATE CHANGE