RP1.2-06: Assessing the barriers to investability for biomethane grid injection projects

A series of knowledge gaps were identified by industry members of the FFCRC that need to be filled to better ensure biomethane projects will be commercially successful (i.e. investable), and are thereby able to realise the opportunities to decarbonise energy systems using biomethane grid injection. These knowledge gaps included both uncertainties on the supply side (the security of feedstock over a project life) and the demand side (the barriers to the success of a project given pipeline infrastructure and injection requirements at locations of interest), as well as what policy support might be required.

This project investigated key knowledge gaps around the investability of biomethane projects, and then applied the learnings to the further development of two biomethane assessment tools developed as part of FFCRC project RP1.2-04. The first tool is a spatial tool that allows users to undertake an assessment to identify the most investable sites across Australia. The second tool provides a project level focus on exploring which factors are most influential on the LCOE and carbon emissions mitigated through biomethane grid injection projects. With the major spatial factors 'fixed' for a given project location, the tool instead focuses on plant size and operation, types of feedstock available and revenue streams to offset cost.

Conducting this investigation into barriers to investability of projects, and the application of findings to the assessment tools, can inform answers to important questions such as:

- What is the gap between cost of production of biomethane and the price of natural gas, and how can this gap be bridged?
- Where would the first 20PJ of biomethane in each state come from, if agricultural feedstock sources were used?

The project had three stages:

1. Build the required understanding and quantitative assessment capability to address the current knowledge gaps surrounding the investability of biomethane projects;
2. Use these findings and the tools developed in Project RP1.2-04 to identify the most investable sites in each state, detailing the first ~10-20PJ of available biomethane; and
3. Utilise this research by incorporating it into the existing tools.

The following two reports were completed and made available to CRC participants:

- **Report 1 – barriers to investability,** which presents research findings for investigations into the stakeholder workshop and pre-workshop survey that were conducted to identify the key necessary elements of a viability assessment framework, related metrics or indicators, and potential case study research locations.
- **Report 2 – most investable sites,** which focusses on not just the upper limits of biomethane potential, but how much biomethane is commercially capturable in each state, and how potential government policies can support this.

The research in Report 1 was organised into the following high-level areas:

- Feedstock management;
- Biogas treatment;
- Connection infrastructure; and
- Revenue streams and policy.

These areas were scoped through a workshop with industry stakeholders, each building on the existing biomethane modelling work in FFCRC RP1.2-04. The main research findings were added to the project level Biomethane Viability Tool, released in June 2024 as part of a webinar. The investigation found that regarding feedstock management, the largest impact to investability was the use of intercropping and energy crops. Of the two, the intercropping options considered lowered the LCOE more (sorghum grain and legumes), as they yielded more biomethane per tonne. In addition, these feedstock types can improve the nitrogen content of the soil, also improving primary crop harvest.

Regarding Biogas treatment and costs of connection, the largest potential reduction in LCOE came from the choice of upgrading technology. For sufficiently low-pressure pipelines, this cost can be avoided as the upgrading technology outlet pressure negates the need for further compression. For small projects, this is a large saving in connection costs. Potential increases in costs to be mindful of include oxygen and nitrogen removal, depending on levels due to feedstock type (these gases are highest for landfill gas).

Regarding the gap between LCOE and the selling price of natural gas, this investigation found that, at a high level, the largest improvements in investability will come from increases in revenue (the largest impact being gate fees) and policy support in the form of a feed in tariff. In this report, this was modelled as a flat tariff rate, but this type of support can be individually negotiated by a project akin to the Contract for Difference (CfD) schemes the state governments have recently implemented for power and storage projects.

Report 2 contains a spatial analysis of the techno-economic viability of biomethane grid injection projects in Australia, using the Online Mapping Tool, both of which were released as part of a webinar in February 2025. Additional research was undertaken from RP1.2-04 to expand the analysis to include carbon emissions so that the impact of Australian Carbon Credit Units (ACCUs) can be explored as part of the wider business case.

The functionality of the tool was also expanded to enable the development of cost curves for each state, and the first 20PJ were identified as part of the assessment. Results show that WA and NSW needed five to six sites compared to three in SA and QLD to reach the 20PJ total, which is a consequence of both the state total feedstock being a smaller amount and/or more spread out across the state, reducing the amount of bioenergy one project could capture. Results also further demonstrate how different combinations of revenues streams and government policies can enable biomethane projects to become investable. These options can be explored directly through the online mapping tool.

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