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By electronic submission

**Re: Australia's Guarantee of Origin Scheme – consultation on product expansion and prioritisation**

To whom it may concern

Santos is an Australian energy company with operations across Australia, Papua New Guinea, Timor-Leste and North America. We are one of Australia's largest domestic gas suppliers and a leading LNG supplier in the Asia Pacific region. Our commitment is to be a global leader in the transition to cleaner energy and lower carbon fuels, by helping the world decarbonise to reach net-zero emissions in an affordable and sustainable way.

Santos welcomes the consultation on development of Australia's Guarantee of Origin scheme. We provide this letter, including associated responses to survey questions (attached as annex), to guide product expansion and prioritisation.

Both within Australia and the broader Asian region, we see a growing demand for synthetic methane, or e-methane, made by combining hydrogen with carbon dioxide in a process called methanation.

- Synthetic methane is chemically identical to natural gas and presents a cost-effective transition option as it can be seamlessly integrated into the existing domestic gas infrastructure and LNG supply chains without the need for new equipment or technology modifications.
- It serves as an effective carrier for green hydrogen, allowing for a gradual and increasing phasing into the natural gas networks as supply develops.
- By enabling the continual use of existing appliances and technologies, synthetic methane stands out as a practical, low-carbon alternative; particularly in sectors such as steel, cement, and alumina where carbon abatement is challenging.
- The potential for use with groundbreaking technologies such as Direct Air Capture (DAC), or in a closed-loop system, where carbon dioxide from combustion is captured and reused, underscores its role as an innovative solution in the push for cleaner energy.

Alongside potential decarbonisation of hard to abate domestic sectors, the transition to synthetic methane is central to key trading partner's decarbonisation policies. For example, Japan's 6th Strategic Energy Plan set a target for synthetic methane to comprise 1 per cent of the gas supply in existing networks (city gas) by 2030, while the Japan Gas Association has flagged a possible 90 per cent goal by 2050. We are working in partnership with several of Japan's largest city gas utilities to make Australia a provider of choice for their ambitious synthetic methane goals.

Having an internationally aligned emissions accounting framework is critical to help progress the development of projects. Specifically, incorporation into the Guarantee of Origin scheme would give customers transparency over the product's emissions, recognising it as a low carbon alternative.

Production and recognition within Australia will also give domestic consumers the option to switch to a low carbon alternative to natural gas.



Santos would welcome a meeting to further discuss the benefits of e-methane for future Guarantee of Origin schemes.

Yours sincerely

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Matt Squire  
**VP Commercial & Business Development, Santos Energy Solutions**



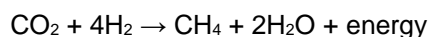
## **Annex: consultation questions**

### ***What product/product specific methodology should the Government prioritise for incorporation into the GO scheme?***

Synthetic methane, also known as e-methane, is a substitute for natural gas, created from green hydrogen and carbon dioxide (CO<sub>2</sub>) in a process called methanation. E-methane acts as a carrier of green hydrogen and as it is molecularly identical to natural gas, its key advantage is allowing reuse of existing natural gas infrastructure and providing a 'drop-in' low carbon fuel for hard to abate sectors.

### ***What is the emissions reduction potential of this product (immediate-term and future), and how would incorporation into the GO scheme support decarbonisation?***

Captured CO<sub>2</sub> is a required input alongside hydrogen in the production of e-methane through the Sabatier process:



As a result, the eventual combustion and release of CO<sub>2</sub> is offset by CO<sub>2</sub> being an input, and the lifecycle emissions between capture and consumption are 'net zero'. E-methane acts as an energy carrier for low carbon hydrogen. There are some emissions in production and transport of e-methane, and transparency for these will be vital to give consumers confidence and choice in the emissions lifecycle.

The product can be blended into natural gas networks and being chemically identical, could be used anywhere natural gas is. As production increases, this could provide decarbonisation of all existing residential, industrial, and hard to abate sectors with no need to replace infrastructure or customer appliances. E-methane may also provide an alternative route to market for existing green hydrogen projects, giving them reliable offtake before hydrogen markets develop.

Like many decarbonisation options, e-methane production costs are currently high. Without subsidies or grants, customers would be required to pay a premium for the product in comparison with its equivalent traditional fossil fuel. Incorporation into the Guarantee of Origin scheme would give customers transparency over the product's emissions, and allow them to claim the low carbon properties of synthetic methane. This is necessary to justify the premium price of the product.

### ***How does this product promote Australia's economic prosperity (immediate-term and future) (eg potential as an export product, investment, employment creation, industrial development etc)?***

The export potential of e-methane as e-LNG is significant, with Japanese utilities acting as first movers in their search for a lower carbon replacement for traditional LNG. For example, Japan's 6<sup>th</sup> Strategic Energy Plan set a target for e-methane to comprise 1 per cent of the gas supply in existing networks (city gas) by 2030. This target has been adopted by some of Japan's largest city gas utilities, driving their targets of first e-methane cargos by 2030. The Japan Gas Association has flagged a possible 90 per cent e-methane goal by 2050, signalling the scale-up potential within Japan alone.

Other Asian customers are similarly starting to look for e-methane as a drop-in low carbon fuel. E-methane being available in the Australian Product scheme will give them confidence and transparency in the emissions intensity of this product. Australia being seen as a provider of choice to Asian energy markets will bring investment, and provide jobs for Australians in the clean energy sector.

On the consumption side, e-methane will keep jobs in hard-to-abate sectors onshore while reducing their emissions. Offering e-methane as an option avoids significant costs in replacing existing industrial processes, and could be readily applied to steel, cement, minerals processing, and power generation.



***What is the product's level of technology, production and market readiness?***

Methanation via Sabatier reaction and renewable hydrogen is estimated at TRL 7-9 – with pilot plants already online in Japan<sup>1</sup> and Germany<sup>2</sup>. Santos understands that some Japanese companies are looking to invest in commercial scale plants (200MW+) by 2030.

The market is ready for e-methane, as a drop in low carbon replacement for natural gas. Export markets are likely to be first movers, however e-methane will be a compelling choice for climate-conscious domestic customers looking for a drop-in low carbon fuel.

***Are there applicable international or industry-led methodologies that could be amended or adopted?***

Santos understands that Japan is currently developing or considering the development of low emission hydrogen & e-methane standards.

***Is this product likely to be an input into another product that could be certified under the GO scheme?***

E-methane can be used for any existing product where natural gas is used. It has potential to be used as an input to future product GOs, including green steel, chemicals and cement.

***How will incorporating the product into the GO scheme deliver beneficial outcomes under existing Australian domestic and international policies?***

Australia is a key provider to the Asia-Pacific LNG market, in many cases the number one source. Providing a credible low carbon replacement for LNG will maintain our close relationship with trading partners. It also shows support for strategic partners such as Japan who are leading the calls for low carbon e-methane to be delivered by 2030.

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<sup>1</sup> <https://www.reuters.com/business/sustainable-business/tokyo-gas-begins-synthetic-methane-trial-using-green-hydrogen-2022-06-24/>

<sup>2</sup> <https://www.audi.ie/ie/web/en/models/layer/technology/g-tron/power-to-gas-plant.html>