20 December 2022

Submission: Energy Security Board Transmission Access Review Directions Paper

The Australian Pipelines and Gas Association (APGA) represents the owners, operators, designers, constructors and service providers of Australia's pipeline infrastructure, connecting natural and renewable gas production to demand centres in cities and other locations across Australia. Offering a wide range of services to gas users, retailers and producers, APGA members ensure the safe and reliable delivery of 28 per cent of the end-use energy consumed in Australia and are at the forefront of Australia's renewable gas industry, helping achieve net-zero as quickly and affordably as possible.

APGA welcomes the opportunity comment on the Energy Security Board (ESB) Transmission Access Review Directions Paper (the Directions Paper). APGA values the proposed congestion charge which will more effectively allocate the cost of congestion to the parties that cause or reduce congestion. APGA recommends options to further improve efficient allocation of energy transmission infrastructure costs in support of renewable energy infrastructure access.

APGA supports a net zero emission future for Australia by 2050[1]. Renewable gases represent a real, technically viable approach to lowest-cost energy decarbonisation in Australia. As set out in Gas Vision 2050[2], APGA sees renewable gases such as hydrogen and biomethane playing a critical role in decarbonising gas use for both wholesale and retail customers. APGA is the largest industry contributor to the Future Fuels CRC, which has over 80 research projects dedicated to leveraging the value of Australia's gas infrastructure to deliver decarbonised energy to homes, businesses, and industry.

APGA makes the following observations relative to the Directions Paper:

- Lessons learned from contract carriage gas transmission pipelines
- Relative costs of pipelines and powerlines
- Opportunity for congestion reduction through hydrogen production

Lessons learned from contract carriage gas transmission pipelines

Gas transmission infrastructure does not experience the same congestion problems seen in the electricity transmission industry. This is because the majority of gas pipelines operate

[1] APGA Climate Statement, available at https://www.apga.org.au/apga-climate-statement

[2] APGA, 2020, *Gas Vision 2050: Delivering a clean energy future*, available at https://www.apga.org.au/sites/default/files/uploaded-content/website-content/gasinnovation_04.pdf

under a contract carriage form of market, whereas the electricity transmission industry operates under a market carriage form of market.

Electricity transmission market carriage

Under the National Electricity Market's (NEM's) electricity transmission market carriage form of market, new generators can connect to a transmission system regardless of whether sufficient transmission capacity exists downstream of the connection point. Infrastructure expansion is only investigated once insufficient capacity constraints arise, then taking years to pass through the Regulatory investment test for transmission. This introduces the possibility of congestion for years following new generation deployment.

Gas transmission contract carriage

Such congestion does not arise under the contract carriage form of market which applies to most gas transmission pipelines[3]. Gas haulage customers secure firm haulage contracts which guarantee a throughput capacity on individual (or a combination of) pipelines. If there is insufficient haulage capacity available to support a new customer, the customer is able to enter into a firm haulage contract in line with the cost to expand the capacity of the pipeline, guaranteeing capacity availability. Put simply, the contract carriage form of market efficiently allocates cost to cause within the gas transmission infrastructure market.

Recommendation

APGA recommends electricity transmission market reform to enable an option to develop contract carriage electricity transmission within the NEM. If this option were made available, capacity constraints could simply be contracted around rather than preventing the free and clear transmission of renewable generation.

Relative costs of pipelines and powerlines

Energy transport and storage by gas pipeline costs less than energy transport and storage by powerlines and electricity storage. This is true for both existing[4] and new[5] infrastructure, including for hydrogen pipeline infrastructure. It will cost hydrogen customers less for electrolysis to occur at the point of renewable electricity generation and for that hydrogen to be delivered to customers by hydrogen pipeline.

An unintended consequence of the difference in forms of market between electricity and gas infrastructure is that they favour electricity transmission over hydrogen pipelines despite

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[3] The Victorian Transmission System is the only gas transmission pipeline system in Australia which operates under a market carriage form of market.

[4] Table 1 and Table 2 in APGA's Submission to the Victorian Gas Substitution Roadmap Consultation Paper, Australian Pipelines and Gas Association 2021 https://www.apga.org.au/sites/default/files/uploaded-content/field_f_content_file/210816_apga_submission_to_the_victorian_gas_substitution_roadmap_consultation_paper.pdf

[5] Pipelines vs Powerlines – A Technoeconomic Analysis in the Australian Context, GPA Engineering https://www.apga.org.au/sites/default/files/uploaded-content/field_f_content_file/pipelines_vs_powerlines_-_a_technoeconomic_analysis_in_the_australian_context.pdf

electricity transmission costing more. This is because the cost of electricity infrastructure is spread over all electricity customers where pipeline customers pay directly for transport.

By spreading the cost of electricity transmission for hydrogen production across all electricity customers, the higher cost electricity transmission option may cost hydrogen customers less despite pipelines costing less to transport energy due to broad market subsidisation. This could lead to a higher than necessary supply chain cost for each states' hydrogen industry, ultimately delivering higher than necessary renewable energy supply chain costs.

Recommendation

The congestion mechanism considered within the Directions Paper goes some way to rebalancing this regulation induced economic imbalance between powerline and pipeline transmission. APGA recommends investigation into broader reforms to more fully address this imbalance to ensure the least cost combination of powerline and pipeline infrastructure is developed throughout Australia's renewable energy transition.

Opportunity for congestion reduction through hydrogen production

Proton Exchange Membrane (PEM) hydrogen electrolysis can be designed to be a highly reactive form of electricity demand. If connected to the NEM directly upstream of points of congestion, PEM electrolysis could be used to reduce congestion by using electricity before it traverses a congested part of the network. While this is technically possible, it would still be more economically viable for electrolysis to be supplied electricity from behind the meter variable renewable electricity (VRE) generation.

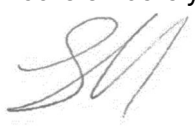
Hydrogen production project investment is anticipated to be amortised across decades. VRE projects have only reached sufficient investment maturity to reach final investment decision (FID) on a merchant basis in recent years, and it is not anticipated that hydrogen production projects will reach the same level of maturity for some time. An economic supply of renewable electricity will need to be sourced for the full amortisation period in order to achieve sufficient bankability for hydrogen production investments to reach FID. A short-term congestion market is unlikely to meet this requirement.

Recommendation

The ESB will need to develop a sufficiently long-term congestion relief product if it wishes to incentivise hydrogen production investment which reduces electricity transmission congestion via the congestion mechanism.

To discuss any of the above feedback further, please contact me on +61 422 057 856 or jmccollum@apga.org.au.

Yours sincerely,



JORDAN MCCOLLUM
National Policy Manager
Australian Pipelines and Gas Association