

## **Submission to ERA in support of ATCO's Innovation Scheme and Clean Energy Innovation Hub**

**Professor Craig Buckley**

My name is Professor Craig Buckley, and I am Head of the Hydrogen Storage Research Group and Deputy Director of the Fuels & Energy Technology Institute at Curtin University, Australia. I am The Australian executive committee member for the International Energy Agency (IEA) Hydrogen Technology Collaboration Program, and an Australian expert on the IEA Hydrogen Task 32: Hydrogen-Based Energy Storage. Given my international experience in hydrogen research, development and demonstration I am confident of my expertise to comment on the ERA 'Issues Paper on Proposed Revisions to the Mid-West and South-West Gas Distribution Systems Access Arrangement for 2020-2024'. I will comment specifically on the components referring to hydrogen.

I fully support ATCO's proposal to introduce a new incentive mechanism, the "Network Innovation Scheme" into the access arrangement. New fuels, such as biogas and hydrogen, have the potential to become mainstream and complementary energy solutions that will use existing gas network infrastructure. The changes that may be seen are the mixing of natural gas and hydrogen until a point at which the natural gas is completely removed and replaced with hydrogen. Furthermore, the hydrogen can be stored underground to streamline the supply and demand of energy. Gas also has a strong probability of being increasingly valued as a way to reduce reliance on grid electricity. As identified in the ENA/CSIRO roadmap power to hydrogen storage is a potential energy balancing solution in a low or zero net emissions system. Trials in the UK including the *H21 project* in Leeds show the technical and economic feasibility of converting the natural gas network in Leeds to 100% hydrogen. In the initial stages testing has been done on introducing 20% hydrogen to the natural gas mix used for residential and commercial purposes, with the aim of reducing overall carbon emissions.

I support that a regulatory innovation scheme complements funding from Government agencies such as ARENA and the SA Government's Renewable Technology Fund. It is essential that Australia is geared towards a future zero emission gas readiness. ATCO's plan to introduce hydrogen to its gas network will ensure that the gas distribution system is ready to receive, transport, deliver and meter hydrogen for long term benefit of its customers. Adopting early steps to prepare the gas network for hydrogen is in the long term interests of customers since the cost of deriving energy from carbon intensive services is likely to rise rapidly in the future.

Hydrogen will require polyethylene pipes for it to be safely distributed throughout the gas network. Other technical challenges such as odour management, flame visibility and velocity at the customer appliances are currently being studied, but further work is required to produce protocols, systems and equipment ready for deployment. ATCO's early adoption of hydrogen will reduce the risk of asset stranding. The elephant in the corner at the present time is the price of carbon. It is reasonable to assume that the cost of carbon will rise in the future, hence ATCO's strategy of introducing hydrogen to the gas network will satisfy future customer demand.

Positioning the gas network to be a complement to electricity services is also a driver to ready the gas network for hydrogen. With the costs of renewable energy (solar PV, wind) rapidly

decreasing, excess renewable energy can be used to produce hydrogen (using an electrolyser to produce hydrogen from water), and this can be stored and distributed in the gas networks. At the present time steam reformation of methane is the least expensive means to produce hydrogen, but a recent report by ACIL ALLEN forecasts that by 2025 the cost to produce hydrogen via an electrolyser (PEM or Alkaline) will be on parity with that of steam reformation of methane.

ATCO's Clean Energy Innovation Hub is a commercial scale hybrid energy system that incorporates roof top solar PV, batteries and natural gas fired generation, and will allow ATCO to investigate the feasibility and role of hydrogen production, distribution and use in a micro grid set-up. With help from ARENA funding, the clean energy innovation hub is an excellent example of how clean energy can be used to inject hydrogen into the natural gas pipework. Without the opportunity of funding from ARENA, and in the absence of a network innovation scheme, the options for gas distribution businesses to innovate are limited under the National Gas Rules. To incentivise investment in innovative technologies, ATCO's 2020-24 Plan incorporates a new network innovation scheme. ATCO believes that the scheme will overcome the disincentive for innovation that is created through the current regulatory framework. I fully support this initiative. I therefore endorse points 47 - 54 on p. 15 & 16 of the Issues paper.

## **References**

Attachment 17.1. Network Innovation Scheme for ATCO – ATCO 2020-24 Plan. EIM # 97220085. Public 31 August 2018.

2020-24 Plan. Access Arrangement Information for ATCO's Mid-West and South-West Gas Distribution System. EIM # 97510620. 31 August 2018.

Proposed Revisions to the Mid-West and South-West Gas Distribution Systems Access Arrangement for 2020 to 2024 Issues Paper. 11 October 2018.

Opportunities for Australia from Hydrogen Exports. ACIL ALLEN Consulting for ARENA, 2018.