

Hydrogen-gas blend could support solar transition

Felicity Wolfe - Wed, 27 May 2015



The North Island's gas pipelines could be used to store excess solar energy, Powerco gas general manager Stuart Dickson says.

Excess solar electricity produced during the day can be electrolysed into hydrogen, which can then be blended into natural gas and transmitted on the existing pipelines, Dickson told delegates at the Energy Management Association of New Zealand conference this week.

The blended gas could then be used to provide back-up on grey, cold days when there is little or no production and a need for heating. Alternatively the hydrogen can be split back out of the gas.

"Research has shown that anything up to 10 per cent of hydrogen in natural gas is possible."

Dickson says using gas to "do the heavy lifting" of space and water heating is also a cheaper option than using grid-connected electricity and would help minimise loads on electricity networks during winter peak periods.

"Gas is a complementary fuel to help the transition to a fully renewables future," he says. "If you take hot water and heating off your house, then photovoltaics become achievable."

He says smarter gas networks will also minimise network investment by smoothing out peak demand.

Powerco has been trialling smart technologies in three houses around the North Island to see how consumers react. All the homes have solar arrays and storage. One is connected to gas and a smart gas meter.

Dickson says he expects smart gas meters to be rolled out in six to 12 months.

"They have proven better than traditional meters in just about every way."

Investment rising

The conference heard that internationally there is strong investment in energy efficiency as countries look to cut their energy costs and carbon emissions.

China and the European Union are showing leadership in their investment, says Dagmar Graczyk, South Asia programme manager for the International Energy Agency's global energy policy office.

In a video presentation, Paris-based Graczyk told the 150 conference delegates that the global energy efficiency market is valued at up to USD \$360 billion a year.

China is investing heavily, having spent USD \$120 billion on energy efficiency between 2006 and 2010, to deliver savings equivalent to about 240 million tonnes of oil.

"China plans on investing more than USD \$200 to USD \$270 billion between 2011 and 2015 to achieve similar levels of energy savings."

But European Union countries have made the greatest gains by improving both energy efficiency and by lowering energy intensity by 28 per cent since 1990.

The EU has €10 billion in structural and development funds available as it seeks further energy savings in buildings and transport.

Globally, institutional investors are increasingly interested in energy efficiency which provides resources "equivalent to investment in energy supply", with additional economic and environmental benefits.

Graczyk says energy efficiency improvements in 11 IEA member countries over 40 years saved them the equivalent of 1.336 billion tonnes of oil in 2012. Energy efficiency is also helping offset the

demand of higher populations and greater industrial output in both developed and developing countries.

What opportunities?

Consultant Robert Tromop says New Zealand has experience creating effective pricing signals to encourage energy efficiency and that should be valuable in this growing international market.

Tromop, recently head of energy efficiency at the IEA, led a discussion on global opportunities following Graczyk's presentation.

He says New Zealand's cost-reflective energy markets provide an almost "unique experience" on how to efficiently connect solar into grids.

"We could be world leaders in this space."

Tromop says New Zealand's local energy efficiency market – transactions of people selling energy efficiency services and products - is worth around \$250 million per year.

Compared with other developed nations, he says New Zealand is "about two-thirds of the way down the pack" on its adoption of energy efficiency. Energy use is growing by about 1 per cent while energy efficiency growth is sitting at about half a per cent.

New Zealand's lower energy efficiency take-up to-date means there are plenty of opportunities here for the sector.

"Japan has been doing this for 30 years and it gets harder and harder for them to find new efficiencies."

Innovation and disruption

Smart meters and other new technologies becoming available will enable more innovative ways to be energy efficient, New Zealand Institute of Economic Research chief executive Laurence Kubiak says.

He says the nation-wide smart meter roll-out is creating a digital network which could be used for much more than measuring energy use. The digital network could provide a range of in-home services, including entertainment.

"Smart meters are agents of enormous disruption."

But he also warns that chasing disruptive innovation is a riskier business proposition than incremental improvement.

New products can initially seem successful when taken up by early adopters, but those customers can lose interest quickly when early versions fail to meet their expectations.

If the initial problems can be resolved, the technology usually experiences more gradual, sustained growth.

Kubiak says the 'internet of things' is at the peak of its early adopter phase, while at the same time people are also becoming wary of 'big data'.

He observed that New Zealand is also better known globally for its expertise in "lifting the hood" and improving existing systems rather than true innovation. New Zealanders also find it difficult to commercialise new products and services.