



Assuring the hydrogen energy economy

A view from LRQA

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With growing evidence that hydrogen is moving into the energy mainstream, LRQA's Leanne Halliday makes a case for an assurance-led approach to building public and political confidence in the future of hydrogen energy. *Know more. Risk less.*

The case for hydrogen

As governments target net-zero emissions by 2050 and the world reduces its reliance on fossil fuels, there is a growing body of opinion that hydrogen will be front and centre as we strive to meet future energy needs.

Hydrogen is abundant and – when produced in the right way – clean. Because it is easy to transport and store, it has huge potential to help overcome the practical limitations of renewables – keeping the lights on when the wind doesn't blow, or the sun doesn't shine. And importantly, for the success of any energy strategy, hydrogen can be an alternative to natural gas for heating – a shift towards hydrogen would be relatively low-cost in converting domestic infrastructure. In fact, in some regions, the boilers in our homes are already burning a blended mix of hydrogen and methane.

Already, momentum is growing. Early adopters are already making use of hydrogen to fuel their operations and vehicles. At the request of the Japanese government under its G20 presidency, the International Energy Agency published a landmark report on the current state of play for hydrogen and its future development, concluding that now is the time to scale up technologies and bring down costs. There are currently just over 11,000 hydrogen vehicles on the road worldwide, and government targets may see that number increase dramatically to 2.5 million by 2030.

Abundant, clean and practical, it is no surprise that some of the world's leading economies – Germany, Japan, South Korea and Australia among them – are factoring a significant contribution from hydrogen into national energy strategies.

But here's the thing.

The experience of coal seam gas tells us that with any new sector, significant project or technology – the potential for concern is greatly magnified. Even in established industries like nuclear, perceptions are stubbornly rooted in the memory of high-profile incidents – no matter that the technologies and safety profile of the nuclear industry have moved on.

Hydrogen will be no different. To fulfil its potential and help meet the world's growing energy needs, public and political approval for its environmental credentials and safety performance will be crucial. For those of us providing assurance, this is where it gets interesting.

Verifying across the hydrogen spectrum

With hydrogen's environmental profile determined by the energy source used to create it, the potential for confusion and misinformation is significant. Even now, the language surrounding production isn't standardised.

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| Green | Hydrogen produced using renewable energy to power the electrolysis of water |
| Turquoise | Hydrogen produced by steam methane reformation, with emissions managed through carbon capture and storage |
| Purple/Pink or Red | Hydrogen generated through electrolysis, powered by nuclear energy |
| Brown | Hydrogen made through the gasification of coal or lignite |
| Yellow | A relatively new term for hydrogen made through electrolysis using solar power |
| White | Naturally occurring hydrogen found in underground deposits, captured through fracking |

Unlocking hydrogen distribution safely and at scale

Where oil and gas production is concentrated in key locations, the future of hydrogen production will be much more fragmented. Production can happen almost anywhere, and we are already seeing the emergence of small scale power plants developed to serve new industrial and commercial centres. In fact, to be economically viable, the hydrogen model demands collaboration and local supply chains.

Large-scale adoption of hydrogen energy will therefore drive a boom in local infrastructure. For countries without experience in oil and gas, developing and running hydrogen hubs will require a new level of engineering, quality and safety capabilities.

There is a clear need for a robust certification approach if the infrastructure is to be developed safely and, in doing so, to win over public and political confidence. Schemes like the UK Gas Industry Registration Scheme (GIRS) have shown the value of getting this approach right – it is a case study in building confidence in energy distribution, with many lessons to learn as we look to unlock hydrogen's potential.

Towards global consistency

The case for independent assurance of the hydrogen production and supply chain is compelling - underpinning both consumer and political confidence in the long-term viability of its use across all applications.

For a worldwide business such as LRQA however, there is a further dimension to consider – how to accelerate the sharing of global best practice and drive regulatory alignment.

Global variances in hydrogen production, infrastructure and adoption are already emerging, and the development of global best practice and consistent regulation will play an important role in demonstrating that hydrogen is safe, sustainable and secure.

Get in touch

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