Nuclear

Is nuclear energy the missing piece in a country's net zero puzzle?

Article

The push towards net zero is a defining feature of the new era of risk management - Assurance 4.0 - with complex challenges for the energy sector in accordance with global initiatives such as the Paris Agreement.

As the global effort intensifies, countries worldwide are facing the challenge of balancing rising energy demands with the urgent need to reduce carbon emissions. In the search for sustainable and reliable energy sources, nuclear energy emerges as a critical yet often underestimated component

Simon Emeny, LRQA's nuclear expert, explores the pivotal role of nuclear energy in supporting a country's energy transition and argues why it should be integral to the net zero solution.

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What are the current key trends in the energy transition landscape?

The global energy landscape is undergoing a transformative shift driven by several key trends:

Rising energy demand

With growing populations and advancing technologies, global energy demand is set to increase significantly.

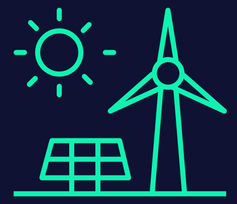
The International Energy Agency (IEA) projects a 50% rise in energy consumption by 2050.

Ambitious decarbonisation goals

Nations worldwide are committing to stringent carbon reduction targets. The Paris Agreement and various national policies underscore the urgent need to mitigate greenhouse gas emissions.

Expansion of renewable energy

Wind, solar, and hydroelectric power are rapidly expanding. However, their intermittent nature presents challenges for maintaining grid stability and reliability.



Technological innovations

Technological advancements are playing a crucial role in transforming the energy sector, enhancing efficiency, reliability, and sustainability. Three key areas of innovation...

- **Energy storage**
- **Smart grid technologies**
- **Nuclear technology**

...are particularly impactful in reshaping the future energy landscape.

How can nuclear energy support a country's energy transition?

According to the IEA, nuclear power currently accounts for approximately 10% of global electricity production, yet it contributes nearly one-third of the world's low-carbon electricity. Nuclear energy's unique attributes position it as a vital contributor to a country's energy transition:

1. Reliable baseload power

Unlike intermittent renewables, nuclear power provides a stable and continuous supply of electricity, which is essential for maintaining grid stability and meeting constant energy demands.

2. Low carbon footprint:

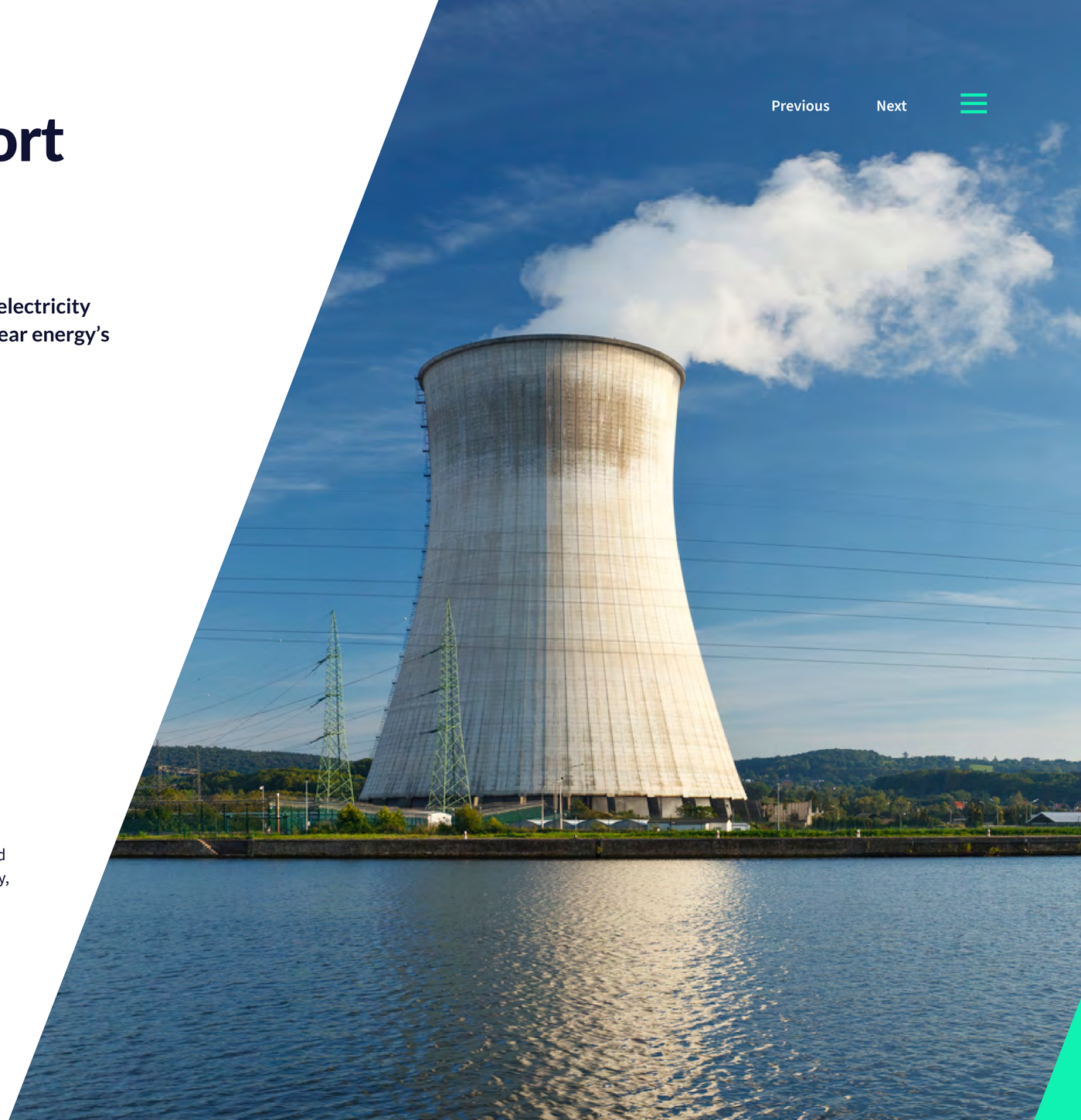
Nuclear energy is one of the lowest carbon-emitting sources of electricity. According to the World Nuclear Association (WNA), nuclear power plants produce no direct carbon emissions, with lifecycle emissions comparable to those of wind energy.

3. Enhanced energy security

Nuclear power reduces reliance on imported fuels, enhancing energy security, particularly for countries with limited natural resources.

4. Improved efficiency with advanced nuclear technologies

Innovations such as Small Modular Reactors (SMRs) and Generation IV reactors promise greater safety, efficiency, and improved waste management solutions, making nuclear energy a more attractive option for future energy needs.



Can nuclear energy be part of the net zero solution?

For the energy sector, the drive to build cleaner, greener energy sources is facilitating a step-change in industrial production, investor focus, corporate governance and governmental regulation. Achieving net zero requires a balanced mix of energy sources. Here's why nuclear energy must be included in this mix:

Meeting emission reduction targets

Nuclear energy's low carbon emissions are crucial for meeting global and national emission reduction targets. It complements renewable energy by providing a stable power supply that mitigates the intermittency of wind and solar power. A study by the Massachusetts Institute of Technology (MIT) found that doubling the share of nuclear power in the global energy mix could reduce global carbon emissions by 4 gigatonnes annually by 2050.

Supporting Sustainable Development Goals (SDGs)

Nuclear energy aligns with several United Nations SDGs, including affordable and clean energy (SDG 7) and climate action (SDG 13). The World Nuclear Association reports that the operational lifetime of nuclear reactors can exceed 60 years, providing a long-term, stable energy supply, that produces less carbon.

Decarbonising industrial processes

Beyond electricity generation, nuclear energy can decarbonise other sectors such as heating, hydrogen production, and various industrial processes. High-temperature reactors, for instance, can produce hydrogen more efficiently than traditional methods.

Safety and efficiency with robust regulatory frameworks

Robust regulatory frameworks and international standards, such as ISO 19443, ensure enhanced safety and efficient operation of nuclear facilities.

LRQA’s commitment to nuclear energy

At LRQA, we enable businesses to build, maintain and decommission nuclear facilities, ensuring their critical assets are safe and operating efficiently. We recognise the critical role of nuclear energy in achieving net zero. Even though there are challenges, nuclear energy offers a reliable, low-carbon, and secure solution that can bridge the gap between current capabilities and future needs. As we strive for a sustainable energy future, it’s time to re-evaluate the role of nuclear energy and embrace its potential as an indispensable part of the net zero solution.

Our comprehensive nuclear services span the entire supply chain, ensuring that safety, efficiency, and regulatory compliance are maintained at every stage. LRQA has a track record of supporting over 600 clean energy projects, including nuclear power, in over 25+ countries and providing clients with expert assurance at every stage of their facilities’ lifecycles – from design to decommissioning. In addition, our ISO 19443 certification services help our clients manage risks, enhance quality, and drive continuous improvement in the nuclear sector.

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LRQA also proudly announced its commitment to the **Net Zero Nuclear Industry Pledge,** a groundbreaking initiative launched by the World Nuclear Association at the COP28 climate change conference. The pledge, crafted in collaboration with leading governments and industry players, outlines a shared vision to triple global nuclear energy capacity by 2050, contributing significantly to carbon neutrality.

Your energy transition partner

About LRQA:

LRQA is the leading global assurance partner, bringing together decades of unrivalled expertise in assessment, advisory, inspection and cybersecurity services. Our solutions-based partnerships are supported by data-driven insights that help our clients solve their biggest business challenges.

Operating in more than 150 countries with a team of more than 5,000 people, LRQA's award-winning compliance, supply chain, cybersecurity and ESG specialists help more than 61,000 clients across almost every sector to anticipate, mitigate and manage risk wherever they operate.

In everything we do, we are committed to shaping a better future for our people, our clients, our communities and our planet.

Get in touch

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