

A photograph of a nuclear power plant with several large, white, hourglass-shaped cooling towers. One tower in the foreground is emitting a thick plume of white steam. The plant is situated next to a body of water, which reflects the sky and the structures. In the background, there are hills and some smaller buildings. The sky is blue with scattered white clouds. The overall scene is a wide-angle shot taken from a low perspective, possibly from a bridge or a road.

**Nuclear**

# The crucial role of nuclear energy in our future

LRQA





In the face of a growing global population and the urgent need to combat climate change, nuclear energy emerges as a pivotal player in shaping our sustainable energy future. In this guide, LRQA nuclear expert Simon Emeny explores the role of nuclear energy in our future, delving into key advancements and the challenges that the nuclear supply chain faces.



**Simon Emeny**

Specialist Markets Director - Inspection Services | LRQA

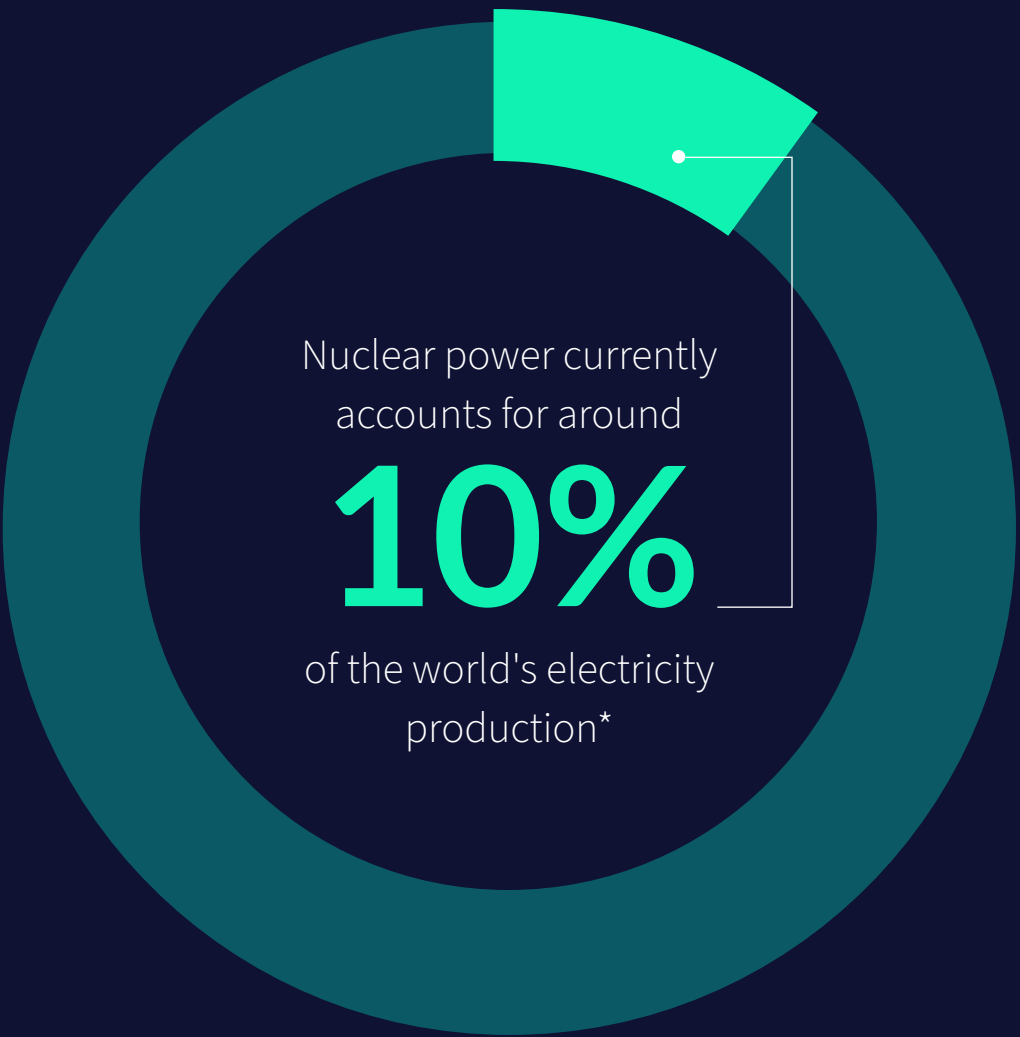


# The growing need for clean and reliable energy

As the demand for energy continues to surge worldwide, finding solutions that are both reliable and environmentally friendly is paramount. Nuclear energy offers a compelling answer to this challenge.

According to the International Atomic Energy Agency (IAEA), nuclear power currently accounts for around 10% of the world's electricity production, unchanged from 2021. This substantial contribution underscores the significant role nuclear energy already plays in meeting global energy demands.

Nuclear energy is a crucial component of the low-carbon energy mix, offering a reliable and consistent source of power without emitting greenhouse gases during electricity generation. In fact, the Nuclear Energy Institute reports that nuclear power plants in the United States alone prevented the release of more than 47 million metric tons of carbon dioxide annually. This carbon-free attribute positions nuclear energy as a vital tool in mitigating the impacts of climate change and transitioning towards a more sustainable energy landscape.



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# Advancements in nuclear technology

Ongoing research and development in nuclear technology have led to the creation of advanced reactor designs that offer improved safety, efficiency, and flexibility. Small modular reactors (SMRs), for instance, present a scalable and cost-effective solution for both developed and developing regions. These compact reactors can be deployed in various settings, providing electricity to remote locations or supporting the integration of renewables into the power grid.

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## Nuclear energy and economic growth

Nuclear energy contributes significantly to economic development by creating high-skilled jobs, stimulating innovation, and fostering a robust industrial sector. According to the World Nuclear Association, the global nuclear industry currently employs over 2 million people, including jobs in construction, operation, and research. As countries invest in nuclear energy, they not only secure a reliable energy supply but also boost their economies through job creation and technological advancements, the UK saw a 20% increase in 2023 over prior year.





# Overcome the risks and challenges throughout your nuclear supply chain

While nuclear energy holds tremendous promise, it is not without challenges.



## Public perception and acceptance

Misconceptions about the safety of nuclear energy persist, hindering public acceptance. Communication efforts are essential to address concerns and build trust in the safety of modern nuclear technologies. Modern nuclear power plants are equipped with advanced safety features and systems to prevent accidents. Our expert team participates in sustainability committees, shapes industry agendas and stays current on key trends to help you seize opportunities and manage risks. This ensures that the insights and solutions we provide are grounded in real-world experience and benchmarked against proven techniques.



## High initial costs

The upfront capital costs of building nuclear power plants can be substantial. Companies face the challenge of securing investment and developing financial models that make nuclear projects economically viable. Advancements in reactor design, construction techniques, and project management have significantly reduced the cost of nuclear power. Additionally, nuclear plants have a long operational life, providing a stable and reliable source of energy over many decades.



## Regulatory hurdles

Navigating complex regulatory frameworks poses a challenge for companies seeking to develop and deploy nuclear technologies. Collaboration between industry stakeholders and regulatory bodies is crucial to streamline the approval process. Our inspectors are authorised to undertake reviews in accordance with global and regional industry standards, and we're accredited by recognised bodies to deliver a range of services that follow international best practices.



## Waste management

The long-term management of radioactive waste remains a significant challenge. Ongoing research is focused on developing advanced reprocessing technologies and secure storage solutions to address this concern.



# Your energy transition partner

As we stand at the crossroads of energy transition, nuclear energy emerges as a formidable ally in the pursuit of a sustainable and low-carbon future. With advancements in technology, ongoing research, and a commitment to safety, nuclear power offers a reliable and efficient solution to the world's growing energy needs. While challenges persist, the potential benefits of embracing nuclear energy far outweigh the hurdles, making it an integral part of the global energy landscape for years to come.

LRQA's extensive track record in renewables is built on over 40 years of experience partnering with some of the world's leading energy producers and brands throughout their transition to cleaner energy. We've supported some of the world's most transformative energy projects, utilising a team of over 1,500 inspectors and specialists who use their deep sector knowledge to help thousands of clients mitigate risk.

[Contact us →](#)



# Your energy transition partner

## About LRQA:

LRQA is a leading global assurance partner, bringing together decades of unrivalled expertise in assessment, advisory, inspection and cybersecurity services – underpinned by data-driven insights – to help its clients navigate a new era of risk.

Operating in more than 160 countries with a team of more than 6,000 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.

## Get in touch

Visit [www.lrqa.com/au](http://www.lrqa.com/au) for more information, email [enquiries.au@lrqa.com](mailto:enquiries.au@lrqa.com) or call +61 37 004 3410



LRQA  
Office 115, Level 18,  
120 Spencer St, Melbourne 3000  
Australia

