

FOR IMMEDIATE RELEASE

Author

Name: Chloe Hirst

Title: Senior Copywriter

Phone: +44 1423 567641

Email: chirst@belzona.com

[Follow Chloe on LinkedIn](#)



Why Protecting Nuclear Power Plants Against Corrosion with Industrial Coatings and Composites Is Critical to Powering the AI Revolution

Artificial intelligence has become one of the defining technologies of our time. It is transforming industries, accelerating scientific discovery and reshaping economies. To support this burgeoning technology, polymeric repair composites and anti-corrosion coatings have an important role to play. They help to safeguard the critical nuclear infrastructure that provides the reliable, low-carbon electricity needed to power the AI revolution.



Polymeric technology plays an important role in nuclear power plant maintenance. Image credit: [BS Italia](#)

AI Is Driving an Unprecedented Increase in Electricity Demand

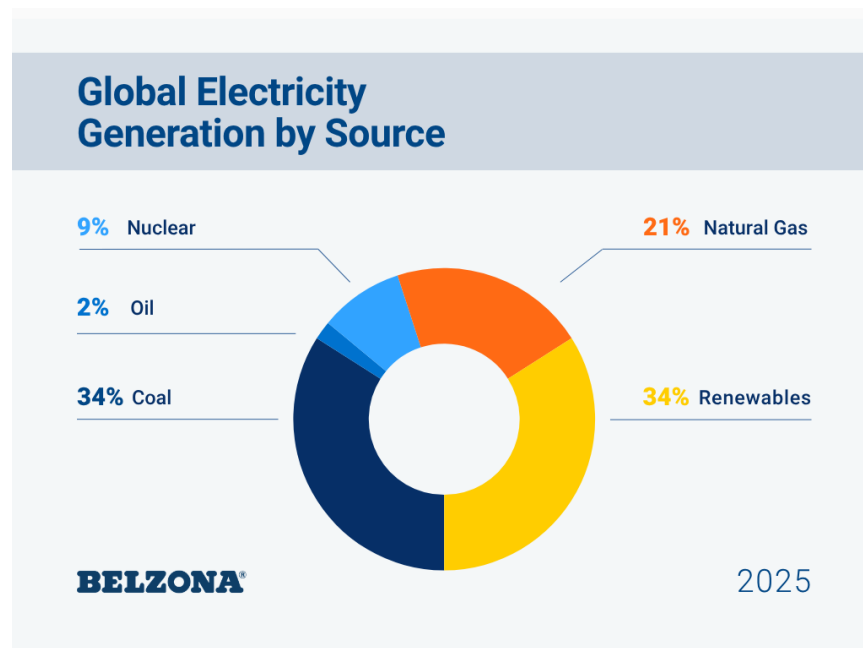
According to the International Energy Agency's (IEA) [Energy and AI report](#), as AI adoption accelerates, electricity demand from data centres is expected to more than double—from 415

TWh in 2024 to approximately 945 TWh by 2030. Meeting this unprecedented growth will require a significant expansion of reliable electricity generation.

Why Nuclear Power Generation Will Support Rising AI Electricity Demand

As electricity demand from AI continues to accelerate, attention is increasingly turning to how this demand can be met with reliable, low-carbon power. While wind and solar continue to expand rapidly, supporting energy-intensive AI infrastructure around the clock will require a diverse electricity mix.

According to [2025 data from the IEA](#), fossil fuels still generate over half of the world's electricity, with coal accounting for 34%, oil 2% and natural gas 21%. However, low-carbon sources are becoming increasingly important. Renewables contribute 34% and nuclear contributes 9% of global electricity generation.



Nuclear generates more than 20% of the world's low-carbon electricity, making it the second-largest source of low-carbon power globally ([World Nuclear Association](#)). The IEA expects nuclear to play an increasingly important role in meeting future electricity demand. It also identifies emerging technologies—including [Small Modular Reactors \(SMRs\)](#)—as an important part of the long-term solution.

This shift is already reflected in investment decisions across the technology sector. Companies including [Amazon](#), [Microsoft](#), [Google](#) and [Meta](#) have announced major agreements and investments related to nuclear energy, recognising the need for reliable, 24/7 low-carbon electricity to support the rapid growth of AI and data centres. These developments reinforce the view that, while renewable energy will remain central to the future electricity mix, nuclear power will play an increasingly important role in providing dependable baseload generation.

But while the industry looks towards the next generation of nuclear technology, one fact remains unavoidable—the reactors already operating today will continue to shoulder much of the world's low-carbon electricity demand for decades to come.

Safeguarding Nuclear Assets with Repair Composites and Protective Coatings

Constructing new nuclear power stations requires enormous investment and lengthy planning, licensing and construction programmes. Extending the operational life of existing facilities, by comparison, can deliver substantial additional generating capacity far more quickly.

Many nuclear power plants around the world are already operating beyond their original design life thanks to comprehensive life extension programmes. As electricity demand accelerates, maximising the reliability and availability of these assets is becoming strategically important.

In this context, industrial polymeric repair composites and protective coatings have an increasingly important role to play, helping safeguard critical infrastructure, extend asset service life and support the long-term reliability of nuclear power stations. Ensuring that existing nuclear facilities continue operating safely and efficiently will therefore be just as important as developing the next generation of reactors.



Repair composites and protective coatings prolong the lifespan of key nuclear assets

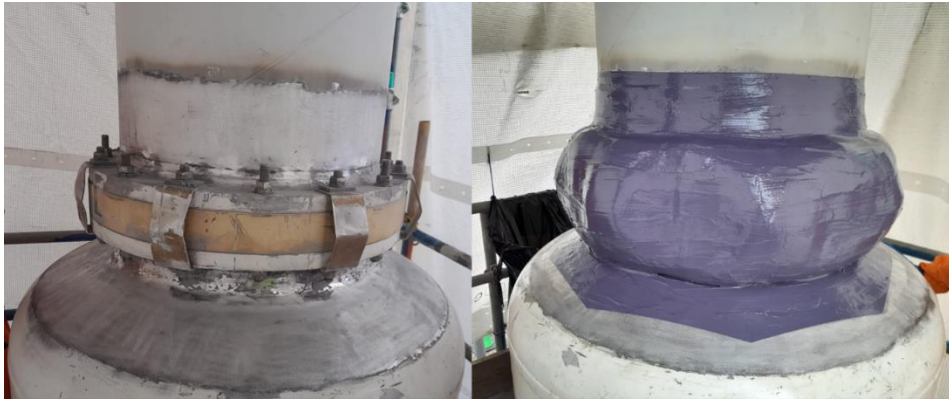
Protecting Against Chemical Attack, Erosion and Corrosion Damage

Polymeric repair composites and protective coatings are engineered to perform in the demanding industrial environments found within nuclear power facilities operating Pressurised Water Reactors (PWR), Pressurised Heavy Water Reactors (PHWR) and Boiling Water Reactors (BWR). Applications are typically focused on balance-of-plant infrastructure, cooling systems, water treatment assets, pipework, civil structures and auxiliary equipment.



Nuclear power plant diagram

As cold-applied materials, they eliminate the need for hot work permits, improving safety and simplifying maintenance. Their ability to be applied in situ helps minimise downtime and disruption, while their long-term resistance to corrosion, erosion and chemical degradation enables them to protect critical assets in aggressive operating conditions. By extending the service life of equipment and reducing the frequency of repairs, these systems also support more sustainable power plant maintenance strategies.



[Belzona SF6-FIX](#) solution reduces SF₆ leaks in nuclear power stations to undetectable levels

Case Study: Pump Repair and Protection

During a planned outage at a Nuclear Power Station in Europe, engineers discovered severe cavitation damage on one of the Plant's main cooling water pump impellers. Replacing the impeller would have extended the outage considerably, while welding risked distorting the component's hydrodynamic profile.



*Ivan Strelar, Belzona Distributor
at ISEA d.o.o.*

Instead, following an inspection by authorised Belzona Distributor, [ISEA d.o.o.](#), the following solution was carried out. Describing the repair process, [Ivan Strelar](#), Distributor of ISEA d.o.o. said: “The damaged areas were rebuilt using the epoxy repair composite, [Belzona 1111 \(Super Metal\)](#), before the entire impeller was coated with the epoxy coating, [Belzona 1341 \(Supermetalgilde\)](#), to improve hydraulic efficiency. Areas exposed to the greatest cavitation forces received additional protection using the polyurethane resin, [Belzona 2141 \(ACR-Fluid Elastomer\)](#). This solution provided a durable repair and long-term protection against cavitation and erosion, while helping to restore the impeller's hydraulic performance and extend its operational service life.”



Cooling water pump impeller repaired and protected against cavitation. Image credit: [ISEA d.o.o.](#)

Case Study: Pipe Leak Sealed with Composite Wrap System

At a Nuclear Power Plant in France, a cooling-water pipeline had suffered extensive external corrosion, resulting in a live leak at one of the welds. Because the pipeline could not be taken out of service, conventional repair methods such as grit blasting and welding were not practical. Instead, a combination of polymeric systems was chosen to repair and protect the damaged pipework.



*Vincent Guerin,
Distributor at
Protecmo*

The specification and application were carried out by authorised Belzona Distributor, [Protecmo](#). Commenting on the application, [Vincent Guerin](#), Distributor at Protecmo, said: “The leak was first sealed using the surface-tolerant epoxy composite, [Belzona 9611 \(ES-Metal\)](#), while areas of corrosion damage were rebuilt with [Belzona 1161 \(UW-Super Metal\)](#), a material specifically designed for application on wet and oil-contaminated surfaces. The pipeline was then reinforced using the [Belzona SuperWrap](#) pipe wrapping composite repair system, incorporating Belzona 1982 Resin and Belzona 9381 Reinforcement Sheet. The repair was completed while the pipeline remained fully operational, eliminating the need for plant downtime. It was also engineered in accordance with ISO 24817, providing a calculated design life of 20 years.”



Composite wrap system applied to leaking pipeline. Image credit: [Protecmo](#)

Cold-Applied Systems Prolong Lifespan of Key Nuclear Infrastructure

Projects such as these two illustrate how cold-applied polymeric repair technologies can help nuclear operators safely address corrosion and leaks on critical assets, extending service life while maintaining plant availability. As electricity demand continues to rise in response to AI-driven growth, solutions that minimise outages and preserve existing infrastructure are becoming increasingly valuable.

Maintaining the Nuclear Fleet That Powers the AI Era

Much of the discussions surrounding nuclear energy understandably focus on future technologies including advanced reactors, SMRs and next-generation fuels. These innovations will undoubtedly shape the future. But they should not overshadow the importance of protecting the infrastructure already generating low-carbon electricity every day.

As AI accelerates electricity demand, the world's existing nuclear fleet becomes increasingly valuable. Keeping these facilities operating safely, efficiently and reliably will require continued investment in practical engineering solutions that extend asset life, minimise downtime and preserve critical infrastructure.



Safeguard nuclear assets with polymeric technology

For more information, please visit: www.Belzona.com

-END-

Wordcount: 1253

Notes to Editor -

About Belzona:

- Established in 1952, Belzona has pioneered innovative polymer technology that has revolutionised industrial repair and maintenance procedures.
- Belzona is a leading company in the design and manufacture of polymer repair composites and industrial protective coatings for the repair, protection and improvement of machinery, equipment, buildings and structures.
- At Harrogate, the full Belzona product range is manufactured to stringent quality and environmental control guidelines complying with the requirements of ISO 9001:2015 and ISO 14001:2015.
- Belzona has over 159 Distributors in more than 120 countries ensuring not only the availability of Belzona materials, but also specification support, project management, application and supervision services. Distributorships and their teams are supported by Belzona Corporate offices in Europe, North America and Asia.

About this article:

- High resolution images, if not supplied with the email, are available on request.
- The article can be altered, lengthened or shortened upon request.

- Can we contribute to the article you are writing? We can provide images, technical data, case studies or an interview with one of our technical service representatives. Please let us know if this would be of interest.
- Do you have an upcoming topic that we could contribute an editorial on? Please let us know the topic, preferable length and the material submission deadline.