

THIS IS ENERGY & ENVIRONMENT

*Nuclear Energy*



# NUCLEAR



Cymru  
Wales

A map of the United Kingdom with various colored dots indicating nuclear power stations and research sites. The dots are concentrated in the central and southern regions of England, with a few in Scotland and Wales. The dots are color-coded according to the key: red for AGR power stations, orange for Magnox power stations, yellow for fuel plants, green for PWR power stations, light blue for decommissioning reactors, pink for fusion research, and purple for new sites or potential new sites.

"Through our Team Wales approach, we'll provide comprehensive support to companies moving here, to support nuclear developments. This underpins our commitment to delivering low carbon energy throughout Wales, and enhancing our supply of highly skilled jobs."

*Ken Skates  
Minister for Economy  
and Transport*

**Key**

- AGR power station
- Magnox power station
- Fuel plant
- PWR power station
- Decommissioning reactor
- Fusion research
- New site/potential new sites

# T H I S   I S N U C L E A R E N E R G Y

*We have a clear ambition in Wales, to create a sustainable, low carbon future.*

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Wales is situated on the Western edge of the United Kingdom, and has a population of 3 million, with direct access to over 60 million people within the rest of the UK. Additionally, you will have access to a supportive devolved government, which has the ability to make things happen quickly.

The UK's National Infrastructure Plan for 2016-21, highlights over £500 billion planned public and private investments, within

728 projects. Energy and environment related projects, play an important part of this mix, with over 230 planned projects, with an associated spend of £285 billion.

In addition, access to the UK's major nuclear energy locations is swift, which enables hassle free travel by your project partners, to do business with your supply chain and academic partners.

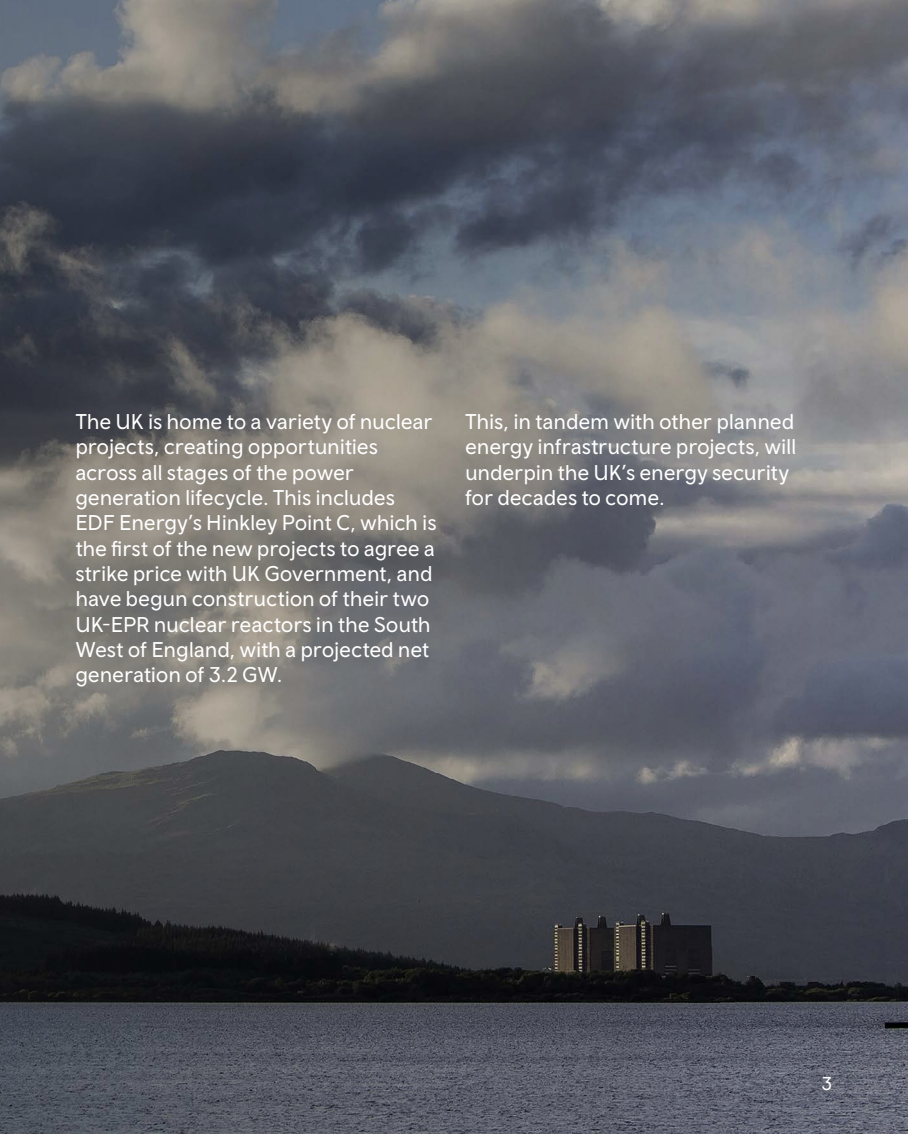
## U K N U C L E A R S E C T O R

*While most countries continue to debate the future of nuclear energy, the nuclear sector here in the UK, is entering a new era.*

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The UK Government, has selected 8 sites across the country, to develop a new fleet of nuclear powered generation facilities, one of which is in North West Wales.

Nuclear energy currently provides just over 20% of the electricity generated in the UK, and the Nuclear Industry Association (NIA) estimates that the civil nuclear sector provides employment to over 65,000 people throughout the UK supply chain. This is anticipated to grow by a further 25,000, when the planned investments come on-stream.



The UK is home to a variety of nuclear projects, creating opportunities across all stages of the power generation lifecycle. This includes EDF Energy's Hinkley Point C, which is the first of the new projects to agree a strike price with UK Government, and have begun construction of their two UK-EPR nuclear reactors in the South West of England, with a projected net generation of 3.2 GW.

This, in tandem with other planned energy infrastructure projects, will underpin the UK's energy security for decades to come.

## W A L E S

*From new-build to decommissioning, suppliers are beginning to bid for a diverse range of short and long term contracts.*

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There are around 1,500 people employed within the civil nuclear sector in Wales, and we have an extensive track record of delivering safe nuclear energy, from our sites at Wylfa and Trawsfynydd in North Wales.

The ongoing decommissioning process at Trawsfynydd, has adopted 'lead and learn' principles, with lessons learnt being extended to other plants in the Nuclear Decommissioning Authority's (NDA) portfolio, across the UK.

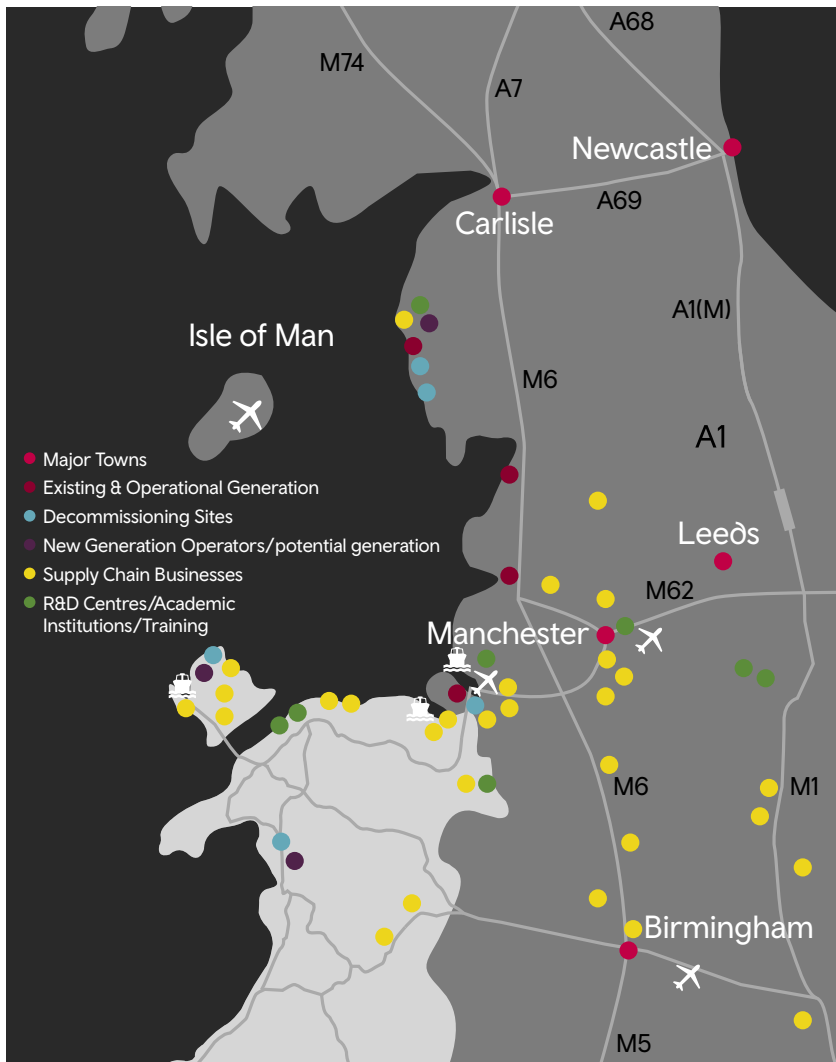
Whilst Hitachi have suspended their investment, for a major new plant at Wylfa on Anglesey, which was to be operated by Horizon Nuclear

Power (HNP), it is hoped that a way forward can be found, that will allow activity to resume at the Wylfa Newydd site. Welsh Government are working with the UK Government, to do everything possible to secure the project.

Welsh Government remain committed to keeping channels of communication open with Hitachi/HNP, regarding future options at the site.

We have identified the following as key future opportunities within the sector:

- New build.
- Small Modular Reactors (SMRs), Advanced Modular Reactors (AMRs).
- Ongoing decommissioning across the UK fleet.
- International opportunities for Welsh supply chain, particularly in decommissioning.





## NEW BUILD HINKLEY POINT C

*Of the 8 sites identified as being suitable for new build in the UK, EDF Energy's Hinkley Point C, is the first to achieve all the required regulatory consents, and to make a final investment decision.*

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'Hinkley Point C' in Somerset, is the first new nuclear power station to be built in the UK, in over 20 years. The £19.6 billion investment, will create exiting opportunities for businesses during construction/operation and, provide low-carbon electricity, for around 6 million homes. It is expected that:-

- Around 64% of Hinkley Point C's construction costs can be spent in the UK.
- Project will create 25,000 employment opportunities and, up to 1,000 apprenticeships.

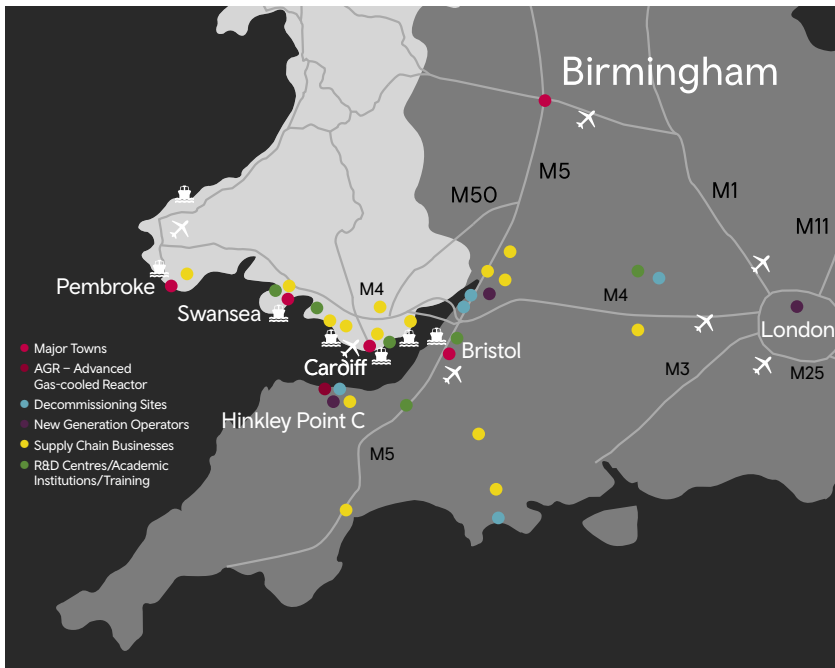
The site is within 90 minutes travel time from South East Wales, with good road connections from South West Wales and, sea transport from various ports across South Wales.

All of South Wales, is within the stated regional area, for supplier engagement.

EDF want to work with UK companies – a large number are already working on or, have become preferred bidders for Hinkley Point C. Some firms have successfully come together to form joint ventures to work on the project. So far, more that 4,000 local businesses have registered their interest and, regional contracts have been signed, with a combined value of £1.3 billion, to date.

In September 2018, representatives from Altrad, Balfour Beatty Bailey, Cavendish Nuclear and Doosan Babcock, joined forces to officially form the MEH Joint Venture, an innovative new partnership, between Hinkley Point C and all Tier One MEH (Mechanical, Electrical and HVAC) and support services contractors, to deliver the erection sequence, for the UK's first new nuclear power station in two decades.





The MEH Joint Venture, will work across the Hinkley Point C site, to integrate and coordinate the delivery of all main MEH and, consolidate works, in line with the project's priorities of safety, quality, time and cost.

This innovative approach will help different contractors work as a single entity. A central Project Management Office will manage critical project interfaces, scheduling and sequencing of MEH activities on site.

Combined, the MEH Joint Venture operates over 13 nuclear licensed sites in the UK, with 20,000 directly employed nuclear experts and, over 65 years of experience.

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# ADVANCED NUCLEAR REACTORS

*Wales is fully committed, to helping the UK realise its vision for advanced nuclear technology (including small nuclear reactors (SMRs), as part of a wider energy mix, and is well placed to support a first of its kind deployment, as the UK's location of choice.*

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Trawsfynydd is well placed to deliver on this vision – with a long history of nuclear energy related employment, a pool of skilled labour, and Trawsfynydd's strategic position on the UK's National Grid infrastructure.

The site is owned by the Nuclear Decommissioning Authority (NDA), who are working with us, to bring forward the site's redevelopment, and are supportive of the development of advanced technologies.

According to a report by the Institute of Mechanical Engineers (ImechE),

in May 2017 – “The UK Government, in collaboration with the Welsh Government, should support making the existing nuclear licensed site at Trawsfynydd in North Wales, available as a location for the building and demonstration of SMRs.”

You'll find exceptional infrastructure on the 50-hectare (123 acre) site around the former nuclear power station, which is also home to one of Wales' largest lakes – 478 hectares (1,200 acres) a natural, low-cost source of cooling – the site is also connected to the National Grid, via its own sub-station.

The local workforce, includes technically skilled professionals, with Trawsfynydd able to access a highly skilled and experienced workforce, and is within easy reach of a substantial advanced manufacturing hub across North Wales.

## M E N A I   S C I E N C E   P A R K

*Menai Science Park Ltd (M-SParc), a wholly owned subsidiary of Bangor University, is developing Wales' first Science Park on Anglesey, to drive growth in knowledge based science.*

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The Park's first building opened in March 2018 and, is already more than 50% occupied.

The UK National Nuclear Thermal Hydraulic Facility at Menai Science Park on Anglesey, is a proposal to bring a £50 million major research and testing facility to North Wales, that has a legacy expectancy of up to

50 years. The Welsh Government, has the opportunity to collaborate with UK Government, to deliver the project as part of the UK's new nuclear research programme.

The UK Government has awarded contracts for the first phase, covering initial technical and research scoping of the facility and, the UKAEA (United Kingdom Atomic Energy Agency) is now working on the facility's design and outline business case. It is intended, that construction could start in early 2020.





## P O R T S

*Wales has strategically located ports, which provide valuable supply chain and deployment support for energy projects.*

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Ports here, have reacted positively to maximise the market potential of energy projects. A prime example, is the Port of Mostyn in North Wales, who have made considerable capital investment to support the offshore wind energy sector, which has enabled them to become RWE's preferred partner, to service their three offshore wind farms in the area. They also work closely with Airbus, to transport their A380 wings. The port has also developed a comprehensive supply chain infrastructure to support the projects, which could provide significant input into the proposed energy developments, along the North Wales coast.

Holyhead Port, is strategically located to support energy projects in North Wales, including the nuclear sector, and has actively worked alongside companies to develop solutions. The port has recently completed a master planning exercise, which incorporated a nuclear development option.

Similarly, Milford Haven, the UK's largest energy port, which is based in South Wales, has an extensive oil and gas supply chain infrastructure, delivering products and services to both sectors.

Associated British Ports (ABP), operates 5 ports along the South Wales coastline, located at Barry, Cardiff, Newport, Port Talbot and Swansea.

ABP offers a wide range of services, and has experience of working alongside energy businesses.



## S U P P L Y   C H A I N

*Alongside our ports, our manufacturing and service base, is striving to meet the industry's need for world class products and services.*

The Fit 4 Nuclear (F4N) programme is an unique service, which assists supply chain companies, to get ready to bid for contracts, within the nuclear industry.

As part of the service, F4N lets companies measure their operations against the standards required to supply into the nuclear industry – in new build, operations and decommissioning – and identify the next steps to close any gaps.

Companies such as Flamgard, AlMet and Faun Trackway in Wales, have all received their F4N certificate.

Wales offers a cradle-to-grave service solution, including a thriving service sector, ranging from Eversheds LLP and Hugh James solicitors, and environmental and engineering companies, such as ARUP and Mott MacDonald plus, all the main construction contractors, including Balfour Beatty and Kier Construction.



## A C A D E M I C   E X P E R T I S E

*From North to South Wales, leading edge nuclear R&D programmes are underway, addressing key industry issues, including technology, training, supply chains, production and economics.*

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Bangor University in North Wales, is a prime example. The University is building world leading capability in nuclear engineering, which will be the hub of a global network.

With a focus on existing and emerging technologies in the nuclear sector, including Pressurised Water Reactor (PWR), Boiling Water Reactor (BWR) and Small Modular Reactor (SMR), Bangor University will become a leading centre of expertise.

Bangor University is developing a world leading capability in nuclear science and engineering, the focal point of which is the Nuclear Futures Institute. This will establish North Wales as a global centre, delivering international partnerships and opportunities, from a rich mix of existing and new talent, in support of the local and regional economy.

### **Nuclear Research Institute**

The first nuclear research institute in Wales, has opened at Bangor University.

The Nuclear Futures Institute has been established with funding from the Welsh Government's Sêr Cymru programme, which is helping to attract world leading researchers to Wales, with funding also coming from the European Regional Development Fund and from the University.

Swansea University, boasts a strong track record in materials research, which includes collaborations with the National Nuclear Laboratory (NNL). Specific areas of activity include:

- Investigation of inter-granular corrosion (IGC) initiation on stainless steel used to clad spent fuels.
- Characterisation of the localised corrosion behaviour of Magnox magnesium alloy.

Aligned with this activity, the University's focus on 'Atoms to Applications', has seen a £9 million



investment by EPSRC and the Welsh Government, to establish an Advanced Imaging of Materials facility (AIM).

AIM is an integrated scientific imaging facility for Wales, that can provide imaging and analytical capabilities across several length scales, from Angstroms to centimetres. The Centre has strong links to large scale private and publically funded facilities, that can extend this capability (in both directions) to picometers and meters.

Swansea also boasts considerable mechanical testing facilities.

The Welding Institute (TWI) is working with the nuclear industry, to deliver process knowledge and system solutions in specialist joining and welding, non destructive testing and materials testing techniques. Their Advanced Engineering Materials Research Institute (AEMRI), aims to develop a nuclear fabrication research centre at TWI Wales in Port Talbot, to support the nuclear supply chain, in the delivery of skills and knowledge.

Meanwhile, Cardiff University runs three separate nuclear projects:

- The Understanding Risk Group at the School of Psychology, is researching public attitudes towards nuclear power and radiation.
- The Geoenvironmental Research Centre, at the School of Engineering, is researching high-level nuclear waste disposal, nuclear repositories and waste isolation.
- The School of Chemistry's Heterogeneous Catalysis and Surface Science Group, is using analytical equipment to study the interaction of small molecules with surfaces — part of a collaboration with the National Nuclear Laboratory, studying long term storage of nuclear waste.

Group Llandrillo Menai, who is National Skills Academy for Nuclear's accredited local provider, delivers the Triple Bar qualification, which focuses on the basic principles of nuclear generation, health and safety and 'human behaviors'. This is an essential, basic requirement, for working on existing nuclear sites, and allows the holder, to access and work unsupervised, on a nuclear facility.

Glyndŵr University in North Wales, is a recognised training provider, and is a Higher Education Associate Member of the National Skills Academy for Nuclear.

## S U P P O R T   N E T W O R K

*Join us in Wales, and your business could work with a number of support bodies.*

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Our newly formed Wales Nuclear Forum, which was established in 2016, has over 200 companies, who are actively working towards supply chain collaboration, and solution provision, to the nuclear industry.

The Wales Nuclear Forum is recognised as the voice of the nuclear sector in Wales and, is an excellent showcase for Wales' business capacity and capabilities – Wales Nuclear Forum attends events across the UK and overseas, to promote member companies.

Please see – [www.walesnuclearforum.com](http://www.walesnuclearforum.com) for further information.

The Sell2Wales website, is an information source and procurement portal, set up by the Welsh Government to help businesses win contracts.

Further details can be found at [www.sell2wales.gov.wales](http://www.sell2wales.gov.wales)



## WHAT NEXT?

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The opportunities for your company to engage with the sector are many and varied – so let's talk.

Find out what Wales can do for your business:

UK—  
+44 (0) 3000 6 03000  
[tradeandinvest.wales](https://tradeandinvest.wales)

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*The Welsh Government has identified 4 distinct yet interwoven opportunities supporting the future development of the sector.*

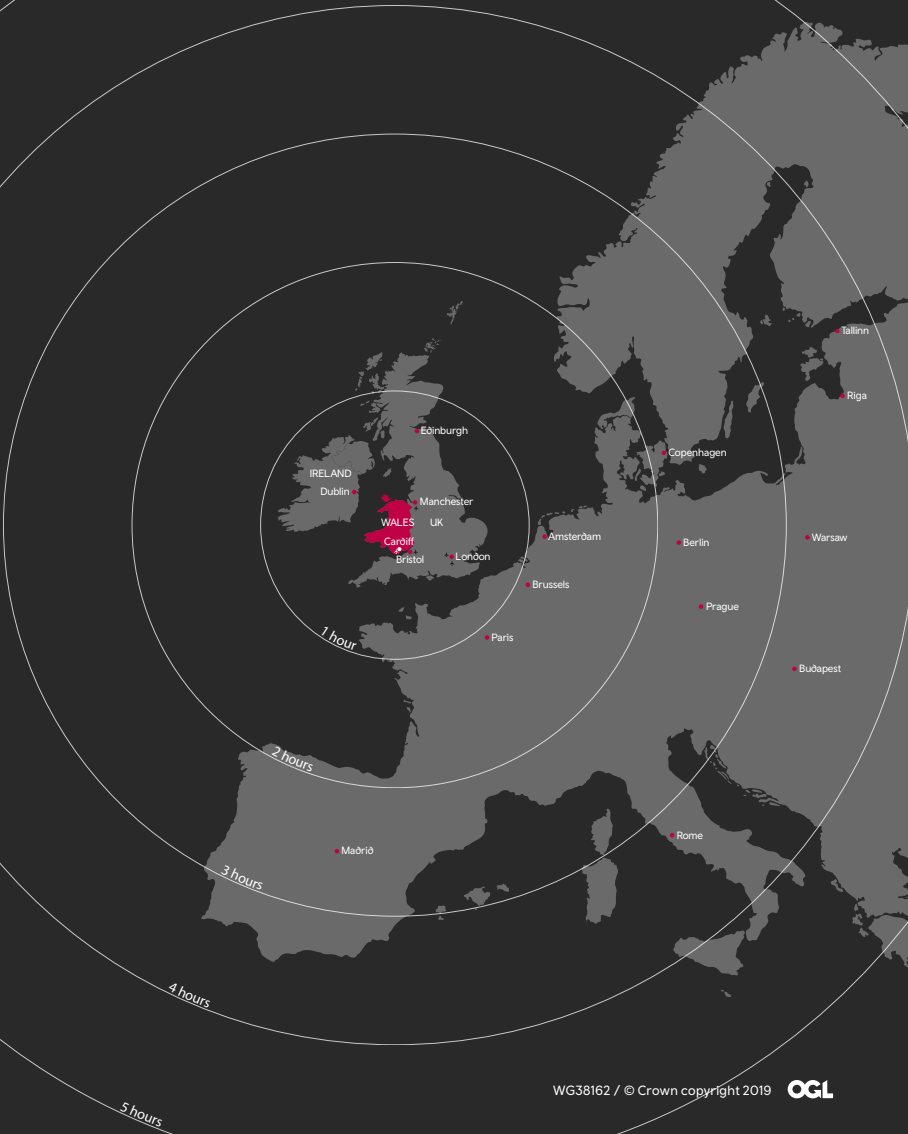
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These include:

- New build.
- Small Modular Reactors (SMRs).
- Ongoing decommissioning across the UK fleet.
- International opportunities for Welsh supply chain, particularly in decommissioning.

Wales is entering an exciting era in the development of nuclear power – and businesses from the UK and overseas, are invited to play a part.







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