

Response to Business, Energy and Industrial Strategy Select Committee Inquiry: Post-Pandemic Economic Growth

September 2020

Submitted by Urenco and U-Battery Ltd.

Introduction

- COVID-19 has been a once-in-a-century event and has had an unprecedented impact on the UK, its society and economy. As such, it has required an unprecedented response from the UK Government in terms of the measures that have been required to see the country through this crisis and return to normality.
- As the country emerges from the crisis, we must ensure that we can best position the UK to return to normality, build a strong economy and return prosperity to our communities. We must also look to learn the lessons of how we can prepare for future crises and mitigate them. This does not just apply to crises in public health.
- As a society, we know the threat posed by climate change. We must take steps now to decarbonise our economy and position ourselves to deliver on net zero by 2050. This will enable us to mitigate the worst damage from climate change, as well as create economic opportunities throughout the UK.
- HM Treasury has previously estimated that the cost of delivering net zero would be more than £1trillion (the estimate of the cumulative investment needed to 2050). This means that an annual investment of between £50-70bn each year is needed, the equivalent of 1-2 per cent of UK GDP¹. Therefore, if the UK is to deliver on this considerable investment, it should focus its efforts on investing in green and low-carbon technologies which will create long-term economic opportunities, while helping to drive forward decarbonisation. The best way to make these investments is in proven low-carbon technologies, such as nuclear and renewables, as well as innovative low-carbon technologies.

About Urenco

Urenco is an international supplier of enrichment services and fuel cycle products with sustainability at the core of its business. Operating in a pivotal area of the nuclear fuel supply chain for 50 years, Urenco facilitates zero-carbon electricity generation for consumers around the world.

With its head office near London, UK, Urenco's global presence ensures diversity and security of supply for customers through enrichment facilities in Germany, the Netherlands, the UK and the USA. The Urenco Group provides safe, cost-effective and reliable services through the expertise of our people and

¹ [Letter from the Chancellor of the Exchequer to the Prime Minister](#)

with the centrifuge technology we use. We operate within a framework of high environmental, social and governance standards, and strict international safeguards

Urenco is committed to continued investment in the responsible management of nuclear materials; innovation activities with clear sustainability benefits, such as nuclear medicine, industrial efficiency and research; and nurturing the next generation of scientists and engineers.

About U-Battery

U-Battery is a micro modular reactor which will be able to produce heat and local power for a range of energy needs. It is being developed by Urenco in collaboration with Jacobs and Kinectrics, plus support from Cavendish, NNL and NAMRC.

U-Battery is participating in the Government's Advanced Modular Reactor Competition, and in Phase 1 submitted a feasibility study to prove its viability in both a technical and commercial capacity. It was announced in July that U-Battery's submission progressed to Phase 2 of the competition and will commence design and development work this year.

U-Battery has identified sizable prospective markets in both the UK, where it can be deployed to power heavy industrial sites, and in Canada, where it can be deployed at mining sites and in off-grid remote communities. As U-Battery can be deployed off-grid, and due to its modular construction and its ability to produce both power and heat, the reactor can potentially serve as a low-carbon replacement for diesel generation around the world, meaning it has a substantial potential global market.

Response to Inquiry

Section 1: Guiding principles for the recovery

- Climate change is an existential threat to the world, and the UK must do its part in tackling what will be the greatest challenge of the 21st century. Recently, there has been a widespread acceptance of the need for action and political progress has been made.
- The UK's enactment of the legally binding commitment to achieve net-zero emissions by 2050 is a ground-breaking step and shows that the UK can be, and is, a world leader in the fight against climate change. However, as we have seen in the response to COVID-19, there is a need for action to be taken, not just rhetoric, in the face of a crisis.
- Therefore, the guiding principle the Government should adopt as part of its recovery package in the wake of the pandemic is to use this unique moment in history to refocus the economy to achieve net zero by 2050.

Section 2: How Government can enable the UK to deliver on these principles; support packages for economic sectors

- The Government should look to continue to support nuclear energy, which is a proven low-carbon source of reliable energy generation. To maximise the contribution nuclear power can make to the delivery of net zero will require the deployment of further large-scale nuclear plants, as well as smaller / advanced reactors which can contribute to meeting the need for heat and hydrogen, as well as electricity. There are now numerous smaller / advanced designs in development, some as low as 4MW output, designed for off-grid applications.
- New cost-competitive nuclear power must be used to make a significant contribution to meeting the increased demand for low-carbon electricity. Urenco agrees with the recommendation from the Nuclear Innovation Research and Advisory Board (NIRAB) that it “would be prudent to plan for nuclear energy to provide at least half of the firm low-carbon electricity not provided by renewables”.² This would be an important target to set as the UK plans its route to 2050, and would form the basis of a long-term commitment to nuclear power, helping to deliver net zero. Government should continue to take tangible steps now, if we are going to meet the 2050 target, and we need to make the necessary near-term enabling steps (in key policy areas such as siting and planning) to support delivery of this target.
- Nuclear fuels are a strategically important sector for the UK, signified by the fact that the UK Government owns a stake in the nuclear fuels company Urenco. Urenco provides enrichment services and fuel cycle products for the nuclear industry for sustainable electricity generation. Urenco has a proud history of being a leader in the nuclear industry and is celebrating its 50th year. The company’s head office is based in the UK in Stoke Poges, Buckinghamshire, and one of its four enrichment sites is in Capenhurst, Cheshire. 25 per cent of Urenco’s fuels production is based in the UK and it currently supplies the majority of countries which use nuclear power, meaning nuclear fuels are a major strategic export for the UK. In 2019, Urenco generated more than £400 million of its global revenues in the UK, making it a sizable contributor to UK GDP. Urenco provides highly skilled and well-paid jobs in the UK, and a recent study showed that for our UK companies, 95 per cent of our supply chain spend was in the UK, most of which was focused in the north-west region.
- As a strategically important sector, it is essential that nuclear fuels are supported in the UK. The UK has vital fuel facilities located in the north-west of England, which provide enrichment and fuel fabrication services to UK and overseas customers. These facilities are staffed by highly skilled employees, as the provision of nuclear fuels is a high-tech industry which allows the UK to be a world leader in this sector. There are (through both direct and indirect employment) around 4,000 people working in nuclear fuels, the majority of whom are based in the north-west. The contribution made by this sector to the UK economy is considerable, with over £240m spent within the UK supply chain.³
- In the Nuclear Sector Deal, the Government recognised “the strategic national importance of maintaining its fuel capabilities” and committed to working with the “UK nuclear fuel industry to ensure continued, commercial operation of these facilities to deliver future energy security as

² NIRAB: [Achieving Net Zero: The role of Nuclear Energy in Decarbonisation](#)

³ [Nuclear Sector Deal](#)

well as ensuring the UK nuclear fuel industry continues to deliver long-term UK economic benefit”.⁴

- This is an opportunity for the UK to implement tangible and meaningful support for the nuclear fuel sector and the UK’s capabilities within it. The UK could commit to a pledge for “UK Fuel for UK (new build) reactors”, which would be a considerable benefit for the industry. Additionally, there is an opportunity for sustaining a strong export opportunity for the north-west – under the Nuclear Sector Deal’s ‘Winning UK Business’ strategy, there is a target for UK companies to secure up to £2bn of new contracts in domestic and export markets by 2030. Given the importance of fuels, part of that target could be for a percentage of those contracts to be fuels. The exporting of nuclear fuels – an existing capability – would have a crucial role to play in helping the north-west recover from COVID-19.
- Urenco is well positioned to support nuclear new build projects in the UK. An important aspect of the post-pandemic recovery and economy will be to have more resilience built into our systems, as well as greater self-sufficiency in critical materials, resources and sectors. Nuclear fuels are a strategic capability of the UK. There are robust and resilient supply chains for fuel, enhancing the case for new build nuclear in the UK, both large- and small-scale, due to the presence of critical infrastructure in the UK operated, in part, by Urenco.
- As well as the positive impact new large-scale nuclear would have on our economy and in contributing to net zero, advanced and smaller reactors present a great opportunity to help decarbonise large sections of the economy in the future. They typically have a higher temperature output, enabling them to contribute to decarbonisation through heat and hydrogen production, as well as through the production of low-carbon, reliable electricity generation.
- Additionally, due to their modular design, they can deliver benefits to the UK nuclear supply chain and create an export opportunity for the UK, which would in the longer term offer an opportunity for economic growth. The use of modular manufacturing, as well as the physically smaller size of the units, means the designs are quicker and easier to design and build, which reduces both the cost and risk profile. Additionally, the more varied applications for such designs mean they can be more comparable to other forms of low / net-zero carbon energy sources.
- There is some overlap between these designs and the UK’s hydrogen economy. For example, U-Battery can be deployed in the production of hydrogen through the copper chlorine process. Greater levels of hydrogen production could contribute to wider deployment of hydrogen vehicles, which supports the Government’s target of phasing out petrol and diesel cars by 2040 and would contribute to the decarbonisation of transportation. Supporting the infrastructure and technologies which can deliver hydrogen in the UK will help to achieve the net-zero target.
- Furthermore, the high temperatures produced (700-710°C) by a deployed U-Battery could also be used directly for Foundation Industries that require continuous and intense heat. This output can also be used in the production of synthetic fuels, such as those being developed for low-emissions aircraft. This represents another, valuable application for this technology and how it can support the low-carbon development of nascent industries.

⁴ [Nuclear Sector Deal](#)

- While it will take some time before these reactor designs can be deployed to the grid, steps need to be taken now in order to support the development of small-scale nuclear, so that it will play a role in delivering net zero by 2050. These steps can be taken as part of the COVID-19 recovery.
- The Government should look to continue its support of advanced designs. The announcement of Phase 2 of the Advanced Modular Reactor Competition was a very positive step, but more work must be done to deliver and support these technologies in the coming years. For example, it would be very encouraging to see the AMR Competition extended and for the planned Phase 3 to be run, as outlined within the Nuclear Innovation Plan that is currently awaiting sign-off from BEIS and HM Treasury.
- Appropriate support for these technologies is crucial to their success. The findings of an independent report⁵, commissioned by the UK Government, revealed that one of the primary obstacles to the development of small nuclear technologies is financial risk. The report recommended that the Government support the technology through funding or subsidy.
- The implementation of a support package for this sector could form part of the recovery work carried out by Government in the wake of the pandemic and would create immediate opportunities in the nuclear supply chain, which would in turn support the development of these technologies.

Section 3: Priority of environmental goals as part of the recovery from COVID-19

- In the aftermath of COVID-19, the Government needs to support the growth of, and ensure there is a favourable business environment for, low-carbon technologies and businesses in the UK. Strategically important sectors and technologies, such as nuclear energy, will have a crucial role to play in the future, as will those who can enable the energy transition. The recovery should also encourage all companies to adopt sustainability as a core value. At Urenco, sustainability is integral to everything we do.
- Core values like sustainability are increasingly important to the running of businesses. According to Bain and Company, “sustainability is now incorporated into two-thirds of companies' core missions”.⁶ Urenco’s aim is to demonstrate and or improve these behaviours and values. Only then can we ensure that we will continue to attract new business, be respected by our regulators, welcomed by our communities, and successful in our ability to attract and retain employees with the skills and expertise we need.
- If Government can encourage the adoption of sustainability best practices for more companies, this will have a positive effect on the post-pandemic economic recovery and benefit the push for net zero by 2050. Companies should develop and implement long-term plans and ensure they look to invest in their employees and people, and communities, targeting sustainable growth in line with emissions reduction targets.

⁵ [Market framework for financing small nuclear](#)

⁶ Bain and Company: [Transforming Business for a Sustainable Economy](#)

- The UK should continue to support technologies which have a limited environmental impact, but show a major, clear decarbonisation potential. U-Battery is a good example of this type of technology. As with any energy generation technology, the reactor will have an environmental impact; however, the impact is minimal compared to other technologies. As a low-carbon technology, it will not produce carbon emissions through generation, and the deployment of U-Battery will support the decarbonisation of heavy industries, some of which are among the highest carbon emitters in the UK.
- Smaller-scale reactors (which have both a smaller physical footprint and a smaller energy output than larger designs) tend to produce a relatively small quantity of spent fuel. It is positive to see advanced reactor designs which can limit refuelling to once every five years and make use of reprocessed fuel to generate power.
- Urenco is a long-term supplier to the nuclear industry and is well placed to provide nuclear reactors with the fuel they need to help decarbonise the economy. Urenco operates four enrichment facilities worldwide, which provide uranium enrichment services and nuclear fuel cycle products to an international customer base. The services and products we provide are used in nuclear reactors in the UK and overseas, helping to facilitate zero-carbon electricity generation.
- Our UK facility is based in Capenhurst, in the north-west of England, and the support of this strategically important facility means that Urenco can play a part in helping the UK recover from COVID-19. A commitment from Government, for example to support a pledge for “UK Nuclear Fuel Services for UK (new build) reactors”, would strengthen the UK nuclear industry, as would the inclusion of fuel services in the nuclear export strategy. Additionally, supporting the use and development of advanced nuclear fuels would enable existing reactors to extend refuelling cycle times from 12-18 months to 18-24 months, which creates efficiencies and improves the economies of nuclear refuelling.
- In addition to the environmental benefits, there is therefore also a clear strategic impetus for the wider development and use of advanced fuels. The UK Government should look to support the development of infrastructure that would accelerate the growth of advanced fuels in the UK, given the importance they will play in nuclear energy as we move towards delivering net zero by 2050.
- Additionally, when looking at the deployment of nuclear new build, thought should be given to the importance of responsible uranium stewardship. Stewardship is a vital part of the nuclear industry’s licence to operate and an important element of its commitment to sustainability. Urenco is committed to responsible nuclear stewardship as a key part of its own commitment to sustainability. The company has expertise in responsible nuclear stewardship through its two UK subsidiaries, Urenco ChemPlants and Urenco Nuclear Stewardship, and has invested more than £1bn in a state-of-the-art facility to manage the depleted uranium hexafluoride (UF₆), or ‘tails’, produced by its core enrichment services.

Section 4: The role of the Industrial Strategy in the recovery

- The Industrial Strategy has enabled the UK to target support towards specific industries through sector deals, while the Grand Challenges have identified and supported critically important and strategic industry sectors for the UK. Given the post-pandemic recovery should, in both the short- and long-term, look to target the delivery of net zero, as well as other critical sectors for the future UK economy, the sector deal model, which helped technologies such as nuclear and other low-carbon sources of generation (namely offshore wind), could be deployed to the benefit of other vital sectors. There is also an opportunity to extend or enlarge existing sector deals as part of the recovery.

Section 5: Net zero and the 'levelling up' agenda

- The recovery from COVID-19 presents a natural opportunity for the Government to refocus the economy in line with wider objectives. By supporting strategically important industries, such as the nuclear sector, meaningful progress can be made towards delivering net zero by 2050 and levelling up the regional economies of the UK. As previously mentioned, Urenco's UK enrichment facility is based in Capenhurst, Cheshire, and currently supplies the majority of countries which use nuclear power, meaning nuclear fuels are a major strategic export for the UK. Additionally, Urenco makes a considerable contribution to the north of England's engineering skills base and invests in its local communities. It supports the wider supply chain across the north and has delivered throughout the COVID-19 pandemic, adapting to circumstances, and continues to meet all deliveries to its customer base.
- There are (through both direct and indirect employment) around 4,000 people working in nuclear fuels in the UK, the majority of whom are based in the north-west. The contribution made by this sector to the UK economy is considerable, with over £240m spent within the UK supply chain. In 2019, Urenco generated more than £400 million of its global revenues in the UK, making it a sizable contributor to UK GDP. Urenco provides highly skilled and well-paid jobs in the UK, and a recent study showed that for our UK companies, 95 per cent of our supply chain spend was in the UK, most of which was focused in the north-west region.
- Given the engineering pedigree and existing skills base, as well as the presence of major engineering companies and partners to the global nuclear industry, such as Urenco, there is a strong case to be made for the roll-out of new build nuclear throughout the north of England, as well as the supporting infrastructure, to produce advanced fuels. As part of the post-pandemic recovery, the Government should look at how it can support the nuclear sector. Urenco would call on Government to consider and adopt the recommendations outlined in the NIRAB report *Achieving Net Zero: The role of Nuclear Energy in Decarbonisation* as a means of supporting the nuclear sector in the long term. Specific support for nuclear fuels is also needed. To do this, the UK could commit to a pledge for "UK Fuel for UK (new build) reactors", which would be a considerable benefit for the industry. Additionally, there is an opportunity for sustaining a strong export opportunity for the north-west through the support for conventional nuclear fuels. Under the Nuclear Sector Deal's 'Winning UK Business' strategy, there is a target for UK companies to secure up to £2bn of new contracts in domestic and export markets by 2030. Given the importance of fuels, part of that target could be for a percentage of those contracts to be fuels.

Additionally, support for advanced nuclear fuels could be a major long-term export opportunity for the UK and should be considered as part of the post-pandemic recovery.

- The benefit to the north of England from new-build and advanced nuclear is considerable. There is a real opportunity for these technologies to become a significant employer in the north of England and support the supply chain there. For example, U-Battery believes that its technology can be produced entirely within the UK. The company has already established that 70 per cent of the components needed are produced by UK companies. The north of England is the region most likely to benefit from this. U-Battery will require steel (which is produced in the north of England, e.g. Sheffield), concrete (which is also produced in the north of England), civil construction and turbine generators.
- Small nuclear – such as the U-Battery design, whose output of 10MW thermal can be delivered in a CoGen configuration with up to 4MWe electricity and the balance as process heat – can play a major role in the decarbonisation of the UK’s heavy industry, which would both contribute towards the net-zero target and benefit economically the regions of the UK where these industries are based. Such small reactors would be installed on an industrial site to serve as a dedicated form of generation for that site.
- Additionally, the deployment of small nuclear on industrial sites to provide a low-carbon source of power and heat will directly support the decarbonisation of heavy industry, which cannot be achieved through on-site renewable energy generation due to the challenge presented by intermittency and the lack of heat generation, which is necessary for many industrial processes. The decarbonisation of industry will be a key step towards achieving net zero.
- The potential market for small nuclear deployed in UK heavy industry is sizable. U-Battery has identified six sectors (steel, paper and pulp, glass, ceramics, chemicals and minerals) that could use the technology to meet their power and heat needs. In a piece of market research and analysis, U-Battery has identified potentially 200 industrial sites in the UK which could use a small nuclear embedded source of generation to meet their future heat and power needs.
- Much of this market is based outside of the south-east, which, alongside London, has traditionally been the most prosperous part of the UK. By sustaining these industries in the long term (by enabling them to decarbonise), there would be regional and economic benefits for the communities in which they are based. This would support the levelling up of regional economies.
- Due to the small size of a U-Battery, this reactor would also support the current direction of travel towards distributed generation, which will allow production at the point of demand. This significant attribute will ensure that there is a reduced need for new energy infrastructure in the future and could support regional economies with their energy needs.
- An important aspect of this is to recognise that there will be regulatory hurdles to overcome in the deployment of this type of technology. This is something for the Government to consider as part of the wider levelling up agenda.
- To successfully level up the economy, not only do new economic opportunities need to be created, but the high costs of doing business in the UK need to be reduced, where possible. With

a lower levelised cost of electricity (LCOE), small and advanced nuclear presents an exciting opportunity to reduce the costs of energy for industrial users. For example, the end users of U-Battery power and heat would directly benefit from a lower cost of energy and heat (compared to current tariffs), and therefore a lower cost base. The cost savings achieved could free up revenues for companies to reinvest in their business, support existing levels of employment or create new jobs, which would all feed back into local economies.

Section 6: What opportunities exist for the UK economy post Brexit and the pandemic for export growth?

- There is an opportunity for sustaining a strong export opportunity for the north-west post Brexit through the support for conventional nuclear fuels. Under the Nuclear Sector Deal's 'Winning UK Business' strategy, there is a target for UK companies to secure up to £2bn of new contracts in domestic and export markets by 2030. Given the importance of fuels, part of that target could be for a percentage of those contracts to be fuels.
- Nuclear fuels will be a critical strategic export around the world and there is a strong rationale for the implementation and use of advanced nuclear fuels by the nuclear sector as we progress towards achieving net zero by 2050. Additionally, supporting the use of and development of advanced fuels would enable existing reactors to extend refuelling cycle times from 12-18 months to 18-24 months, which creates efficiencies and improves the economies of nuclear refuelling.
- Urenco, which is headquartered in the UK, provides enrichment services and fuel cycle products for the nuclear industry for sustainable electricity generation. Urenco has a proud history of being a leader in the nuclear industry and is celebrating its 50th year. It currently serves customers all over the world and is a key part of the UK's strategic capability in the provision of nuclear fuel.
- As mentioned previously in this submission, in 2019, Urenco generated more than £400 million of its global revenues in the UK, making it a sizable contributor to UK GDP. Urenco provides highly skilled and well-paid jobs in the UK, and a recent study showed that for our UK companies, 95 per cent of our supply chain spend was in the UK, most of which was focused in the north west region.
- It has also developed a capability in the provision of next-generation fuels and aims to become a global supplier of choice for them. With more than 50 years of experience as a leader in the nuclear industry, providing enrichment services for utility customers, Urenco is uniquely well placed to achieve this.
- Urenco has developed the capability for the production of next-generation fuels using existing advanced gas centrifuge for the full range of low enriched uranium (LEU) enrichments, and several Urenco enrichment facilities are already licensed to produce enrichments above 5 per cent U235, in line with the market requirements of today's nuclear industry.
- Plans are underway to progress the design engineering and related licensing and transportation activities to support the production of next-generation fuels. Urenco is leading the industry on the detailed planning and early engagement with regulators needed to solve the practical and logistical challenges of production and transportation.

- The export of conventional and advanced nuclear fuels by the UK nuclear sector would be an opportunity for the UK post Brexit and would ensure that the UK retains the capability to deliver a strategically important technology, such as nuclear fuels. But to truly maximise the opportunity the Government must look to support the development of infrastructure that would support the growth of advanced fuels in the UK, as well as the critical infrastructure needed to produce them, given the importance they will play in supporting nuclear energy as we move towards delivering net zero by 2050. It is also essential that the UK protects its existing capabilities in nuclear fuels and its ability to provide all aspects of the nuclear fuel cycle here in the UK.
- The support of small and advanced nuclear presents a new long-term export opportunity for the UK, and these technologies could also make the UK more competitive and potentially able to compete with other geographies. Small nuclear technologies could have a major impact on regions within the UK, especially regions in the north of England, home to the UK's heavy and energy-intensive industries which must look to decarbonise, along with the rest of the economy.
- A technology such as U-Battery could ensure that these industries remain in place and can be sustained as part of a decarbonised, modernised UK economy. If these industries were lost due to the lack of a suitable source of low-carbon power generation, there is a risk that those regional communities would be left behind as the country looks to level up.
- Furthermore, the manufacture and development of these technologies in the UK would help bring new high-skilled employment, export potential, and a boost to manufacturing and regional economic benefits, most likely in the north of England and in Wales, as that is where the industrial clusters already exist.
- U-Battery is a good example of the economic benefit an advanced modular reactor could bring the UK. Forecasting the deployment of ten or more units a year, at an assumed unit cost of £40 million (the lowest cost estimate for a unit currently), means that U-Battery has the potential to generate rapid growth, with assets totalling half a billion pounds per annum. This would generate new tax revenues for HMT. As U-Battery is an exportable technology, there is also considerable growth potential in international markets.
- There is, therefore, an opportunity for the UK to export modular reactor components and units around the world, while ensuring the long-term prospects of the UK's heavy industry and manufacturing sectors. This would mean that these industries could continue to export where they already do and, due to the reduced cost of energy, look to grow their businesses, including into international markets.

Summary

The guiding principle the Government should adopt as part of its recovery package in the wake of the pandemic is to use this unique moment in history to create the key enabling steps (including a supportive and coherent long-term energy policy) to refocus the economy to achieve net zero by 2050.

New cost-competitive nuclear power must be used to make a significant contribution to meeting the increased demand for low-carbon electricity, and the Government should consider the recommendation from NIRAB to “plan for nuclear energy to provide at least half of the firm low-carbon electricity not provided by renewables”.⁷ Government should also consider and adopt the recommendations outlined in the NIRAB report *Achieving Net Zero: The role of Nuclear Energy in Decarbonisation* as a means of supporting the nuclear sector in the long term.

An important part of the post-pandemic recovery and economy will be to have more resilience built into our systems, as well as greater self-sufficiency in critical materials, resources and sectors. Nuclear fuels are a strategically important sector for the UK and can be a major export opportunity. Additionally, supporting the use of and development of advanced fuels would enable existing reactors to extend refuelling cycle times from 12-18 months to 18-24 months, which creates efficiencies and improves the economies of nuclear refuelling.

The UK has vital fuel facilities located in the north-west of England which provide enrichment and fuel fabrication services to UK and overseas customers. These facilities are staffed by highly skilled employees, as the provision of nuclear fuels is a high-tech industry which allows the UK to be a world leader in this sector. There are (through both direct and indirect employment) around 4,000 people working in nuclear fuels, the majority of whom are based in the north-west. The contribution made by this sector to the UK economy is considerable, with over £240m spent within the UK supply chain.

The UK should implement tangible and meaningful support for the nuclear fuel sector to preserve the UK’s capabilities in the industry. The UK could commit to a pledge for “UK Fuel for UK (new build) reactors”, which would be a considerable benefit for the industry. Additionally, there is a strong export opportunity for the north-west – under the Nuclear Sector Deal’s ‘Winning UK Business’ strategy, there is a target for UK companies to secure up to £2bn of new contracts in domestic and export markets by 2030. Given the importance of fuels, part of that target could be for a percentage of those contracts to be fuels.

The UK Government should look to support the development of infrastructure that would promote the growth of advanced fuels in the UK, given the importance they will play in supporting nuclear energy as we move towards delivering net zero by 2050.

Government should encourage the adoption of sustainability best practices for more companies as part of the post-pandemic economic recovery and the push for net zero by 2050. Companies should develop and implement long-term plans and ensure they look to invest in their employees and people, and communities, targeting sustainable growth in line with emissions reduction targets.

The Industrial Strategy has enabled the UK to target support towards specific industries through sector deals, while the Grand Challenges have identified and supported critically important and strategic industry sectors for the UK. Given the post-pandemic recovery should in both the short- and long-term look to target the delivery of net zero, as well as other critical sectors for the future UK economy, the sector deal model could be deployed to the benefit of other vital sectors.

Advanced and smaller reactors present a great opportunity to help decarbonise large sections of the economy in the future. Due to their modular design, they can deliver benefits to the UK nuclear supply

⁷ NIRAB: [Achieving Net Zero: The role of Nuclear Energy in Decarbonisation](#)

chain and create an export opportunity for the UK, which would in the longer term offer an opportunity for economic growth.

To best support advanced designs, Government could announce the planned Phase 3 of the Advanced Modular Reactor Competition as outlined within the Nuclear Innovation Plan (which is currently awaiting sign-off from BEIS).

Support for the nuclear sector would be of great benefit to the north of England. Urenco makes a considerable contribution to the north of England's engineering skills base, invests in its local communities and supports the wider supply chain.

U-Battery believes that its technology can be produced entirely within the UK (70 per cent of the components needed are produced by UK companies), and the north of England is the region most likely to benefit from this. Additionally, small designs like U-Battery will play a major role in the decarbonisation of the UK's heavy industry, which would contribute towards both the net-zero target and benefit economically the regions of the UK where these industries are based.
