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STRENGTHENING THE US/UK SPECIAL CIVIL NUCLEAR RELATIONSHIP

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CONTENTS

01 SUMMARY

The US and the UK have long collaborated on civil nuclear technology as part of the transatlantic "special relationship." This paper provides recommendations for a new bilateral agreement to enhance and deepen their cooperation, focusing on reducing costs and speeding up the deployment of Small Modular Reactors (SMRs) and "Generation IV" nuclear power systems - including Advanced Modular Reactors (AMRs) (see table below). By deepening cooperation and pooling demand, the two nations could reduce costs through learning rates and commissioning larger order books. These efficiencies could deliver cost savings in the 20-30% range (for 10 reactors) or 30-40% (for 20) per MWh, on the levelized cost of electricity produced.[1] Both countries have recognized that collaborating on these technologies is vital for energy security and economic prosperity. They understand that industrial and technological success, and the future jobs on which citizens will depend, increasingly rely on secure access to low-cost power in a more volatile world.

Geopolitical adversaries like China and Russia are moving fast to build cutting-edge projects and secure associated supply chains. A renewed commitment to deeper civil nuclear collaboration will be necessary so that the US and UK, and their allies, are not left behind or dependent on these actors. Drawing on extensive interviews with policy and industry experts from the US and UK, this paper sets out a pathway to realizing this goal.

The paper finds that the US and UK are well-suited for collaboration on SMR and Gen IV technologies, with each having strengths that complement the other's needs. The countries have long cooperated on defense uses of nuclear technology. This is a robust technical and institutional foundation for a new enhanced civil nuclear partnership. Both nations also have new governments that are eager to support those domestic industries which would benefit from nuclear power's reliability, such as steel production and artificial intelligence (AI), in order to boost economic growth, and create new jobs.

Building on this opportunity, this paper recommends that the US and the UK should agree to a new comprehensive treaty, or special bilateral agreement. This should encompass existing agreements, and be built around three core pillars:

PILLAR 1: A Western pipeline for new nuclear

Enable a transatlantic strategic program for SMR and Gen IV technologies. Focusing on one or two selected reactor designs, this will address two key barriers to delivery – accessing credit and reducing project costs. In practice, this should include:

- A technology consortium: limit reactor models supported by the US and UK to streamline supply chain management and send clear investment signals.
- Shared orderbooks: coordinate deployment timelines and volumes to share resources, achieve economies of scale, and enhance supply chain efficiency.
- Export credit support: align on requirements to unlock export credit financing on both sides of the Atlantic.
- Streamlined regulations: collaborate on regulatory assessments to avoid duplication, expedite site selection, and fast-track approvals for SMR and AMR deployment, taking steps towards licensing reciprocity and harmonization.

PILLAR 2: A geopolitically secure supply chain

- Cooperate on tariff harmonization and other trade controls: work towards aligning tariffs and other trade controls (e.g., import bans) on nuclear fuel and supply chain imports, especially from Russia and China, to reduce cost barriers and ensure smoother trade flows.
- Map supply chains and expertise: Commit to a comprehensive mapping of existing supply chains and areas of expertise in the nuclear sector to identify opportunities for collaboration and streamline resource allocation.
- Develop critical sectors: consider joint funding and ventures among governments, vendors, and offtakers to expand fuel cycle facilities and reduce dependence on Russian and Chinese imports.
- Bespoke free trade agreements: work towards tariff-free trade between the US and UK for nuclear fuel and reactor supply chain components to lower costs and enhance efficiency across the entire lifecycle.
- Establish a reciprocal nuclear skills visa program: facilitate workforce mobility through mutual recognition of nuclear skills, addressing skill shortages, and enhancing collaborative efforts.

PILLAR 3: Securing long-term growth

- Enhance cooperation in third country markets: in addition to strengthening financing partnerships in third country markets, both countries can deepen collaboration in engaging aspiring entrant states by assisting embarking nations on capacity building and the establishment of regulatory and other necessary institutional frameworks to start civil nuclear programs.
- Leverage capital markets to drive expansion: mobilize Wall Street and London capital markets to invest abroad, including in Central and Eastern European projects, by offering a 50-75% guarantee of equity invested by private sector funds.
- Continue regulatory leadership in advanced technologies: continue work to develop a global regulatory framework on nuclear fusion, and jointly develop testing capabilities for advanced fission and fusion systems. This should facilitate commercialization of technologies currently under development in the US and UK, and secure the nations' long-term competitiveness and expertise in this space.

02 THE CASE FOR ACTION: NATIONAL SECURITY AND INDUSTRIAL PROSPERITY

The rise of the special civil nuclear relationship

For decades, the US and UK have collaborated closely on civil nuclear technology, growing out of early military partnerships. This has expanded through several international agreements, and across generations of technological development.

This relationship traces back to the Manhattan Project during World War II, when British scientists played a key role in developing the fission bomb, contributing to the foundations of what Winston Churchill termed the "special relationship."[2]

In the post-war period, the 1958 US-UK Mutual Defense Agreement (MDA) established a framework for exchanging nuclear materials, technology, and scientific information; thus facilitating civil nuclear collaboration. The MDA enabled the exchange of plutonium which was produced by British Magnox reactors, including from the world's first commercial-scale nuclear power station, Calder Hall, which was completed in 1956.[3]

During the energy crises and non-proliferation debates of the 1970s and 1980s, the US and UK continued joint efforts in reactor design, nuclear fuel development, and safety protocols, while sharing regulatory standards. Britain also joined the European Atomic Energy Community (Euratom), which maintained an agreement that enabled the United States to export its reactor designs and components to Europe, in return for fuel. By the mid-1970s, this allowed the US to become the world's largest supplier of nuclear power, and an important contributor to Europe's energy security.

The need for renewal

The US and UK have maintained their collaboration on developing SMRs and Gen IV technology, even following Britain's exit from the EU and Euratom. Recent years have seen the two countries sign the Civil Nuclear Collaboration Agreement (2018, amended 2024) and a Civil Nuclear Partnership (2022) as part of the Atlantic Declaration. The latter focuses on deepening information sharing, pooling funds for R&D spending, and excluding Russia from international fora on Gen IV development.

While military collaboration remains strong, the special civil nuclear relationship is not, however, what it once was. US-UK global civil nuclear leadership declined in the 1990s and 2000s due to safety concerns, environmental issues, cheap gas, and the rise of renewables. Despite proponents like Tony Blair pivoting to emphasise nuclear energy's climate change mitigation potential,[4] no new nuclear power station has been built in the UK since 1995 and in the US, the average operational plant is now 37 years old.

This decoupling of military and civil nuclear collaboration was reflected in our stakeholder research. Interviewees were very positive about the deep history of US-UK nuclear collaboration but were frustrated that cooperation on the civil elements had declined over time. They volunteered the AUKUS submarine agreement as an example of the potential that remains for US-UK partnerships and supported the extension of this back into the civil sector. In particular, they felt that supporting select technologies and promoting supply chain cooperation were key elements.

As one US industry expert said: "Our greatest strength is this incredible shared history that we have together on all aspects – from the front end of the fuel cycle, generation, military application for nuclear propulsion of our collective navy fleets, to the back end of the fuel cycle." According to another: "There is a very long-standing strong connection, particularly on mutual defense purposes between the United States and the United Kingdom, where we share information around our weapons programs and our naval programs in a very unique way... my general feeling is there's a lot of talk but not a lot of tangible action and outcomes on the civilian side."

The consequences of a failure to revive US-UK civil nuclear cooperation could be grave, both geopolitically and economically.

China has dominated the build-out of new nuclear energy globally since 2000, building most of its fleet of 56 reactors in that time, with a further 120 planned by 2035. This will see it become the world's leading nuclear power generator.[5] It is also ahead in new nuclear technology, having built and operationalized the world's first small modular Gen IV reactor demonstration, the Shidaowan high-temperature gas-cooled reactor (HTR-PM).[6] Meanwhile, Russia has become a key global player in the nuclear fuel market, accounting for 44% of the world's uranium enrichment capacity, including 35% of US fuel imports and 20% of EU imports.[7]

Current trends indicate that the US and UK risk being left behind or dependent on geopolitical adversaries like Russia or China, with severe implications for their joint energy security and economic resilience.

Considering today's ever-increasingly complex geopolitical environment, nuclear energy is once again vital for national security. The world is currently at the cusp of an inflection point for projected demand for nuclear energy,[8] and newer forms of nuclear energy have the potential to power industries that are key for national security and prosperity, such as steel, semiconductors, data and AI, and maritime propulsion. Nuclear is a strategic sector, with leadership in global civil nuclear regimes having significant security implications for both the US and UK.

Thus, a new bilateral agreement on civil nuclear cooperation cannot merely be framed as an economic or industrial partnership, it must be given an equivalent weight and prioritization as the ongoing and robust defense collaboration between the two countries. Given present technological, commercial, and geopolitical developments, a renewed UK-US partnership on nuclear energy is timely and urgent.

The opportunity: SMRs and Gen IV technologies

As a highly technical and sensitive technology, cooperation on nuclear energy faces several challenges. The US and the UK, however, have over 60 years of history on which to draw. This provides a unique, and highly valuable, architecture of relationships, trust, and mutual understanding.

Stakeholders, however, noted that this collaboration now needs to go further and deeper. "The real challenge and real opportunity for closer working collaboration is the advanced reactors," one industry stakeholder said. Another was even more urgent: "We need prime ministers and energy secretaries to be signing pieces of paper, committing the countries to coordinate and align. This is something underpinned by a treaty."

The good news is that there are significant political and economic opportunities for such an agreement. Politically, the new US administration will be keen to harness the country's domestic industrial strengths and champion its AI-rich Silicon Valley support base, which has been calling for new nuclear projects to power always-on data centers. Meanwhile, the UK is aiming to reinvigorate its nuclear sector and thereby rebuild former industrial communities. According to the UK SMR Consortium, led by Rolls Royce, up to 40,000 regional jobs in nuclear component manufacturing could be created if the UK commissions 16 SMRs by 2040.[9]

The US and the UK have complementary comparative advantages to cooperatively achieve these aims. While the US excels due to its leadership in advanced reactor design, expertise in operating a large nuclear fleet, and regulatory experience, the UK's advantage lies in its R&D (including experience operating non-light water reactors), site construction, and expertise across the fuel cycle, from uranium enrichment through to decommissioning. The UK also has significant historical experience in operating gas-cooled reactors.

At the same time, there are also barriers to action, not least the high upfront capital investment currently needed to build new nuclear plants. To overcome such barriers and strengthen the special civil nuclear relationship, the rest of this paper outlines the elements of a new US-UK treaty or special agreement on SMRs and Gen IV technology.

GENERATIONS OF NUCLEAR AND THEIR FUEL TYPES

NAME	DATE DEVELOPED	EXAMPLES	TYPE OF FUEL	ADVANTAGES	DISADVANTAGES	OTHER NOTES
Generation I	1950s-1960s	Shippingport (U.S.), Calder Hall (UK)	Low-enriched uranium (LEU), natural uranium	Laid the technological foundation for future generations	Primarily prototypes; only a few remain operative today, mostly for historical or research purposes	Served as demonstrators for civilian nuclear power
Generation II	Late 1960s	PWRs, BWRs, CANDU reactors		Backbone of today's nuclear infrastructure; 40-year lifecycles, active safety systems	Requires active safety management	Adaptable to different fuel types, such as mixed oxide (MOX) fuel; majority of operational plants worldwide
Generation III/III+	Late 1990s	Westinghouse AP600, AP1000 EDF EPR	LEU/HALEU High-assay low-enriched uranium (HALEU)	Improved fuel technology and safety, longer lifespan (around 60 years), passive safety features	Generally larger and more complex than earlier generations	Generation III+ focuses on improved performance under extreme conditions and reduced waste output
Small Modular Reactors (SMRs)	Emerging/ Contemporary	Rolls Royce SMR Westinghouse AP300 GE-Hitachi BWRX-300 Holtec SMR		Versatility, compact and efficient energy generation, inherent safety features, passive cooling	Costs and regulation might pose challenges	Designs rooted in Generation III/+ technologies with exploration of Gen IV principles; suitable for diverse applications like AI and data centres
Generation IV	Current/Early Deployment	AMRs; non-light water reactors, including those utilizing fast neutron spectrums Russia BN-Reactor Series		Sustainability, safety, advanced fuel cycles, waste minimisation, high-temperature operations	Some Gen IV reactor types still in developmental stages and with little cumulative operating history and experience	Some designs support closed fuel cycles; most designs integrate advanced cooling systems like gas or liquid-metal cooling
Advanced Modular Reactors (AMRs)	Emerging/ Contemporary	TerraPower Natrium X-energy Xe-100 Kairos KP-FHR China HTR-PM	HALEU - High-assay low- enriched uranium	Enhanced passive safety characteristics, higher thermal efficiencies, non-electric applications, and smaller footprints open up new deployment, siting, and end-use opportunities	Constraints in HALEU availability are primary bottleneck	Multiple AMR designs are currently being advanced via the US Department of Energy's Advanced Reactor Demonstration Program (ARDP), some with offtake agreements with US Big Tech (Google, Amazon, etc.)

PILLAR 1

03 A Western demand pipeline for novel technology

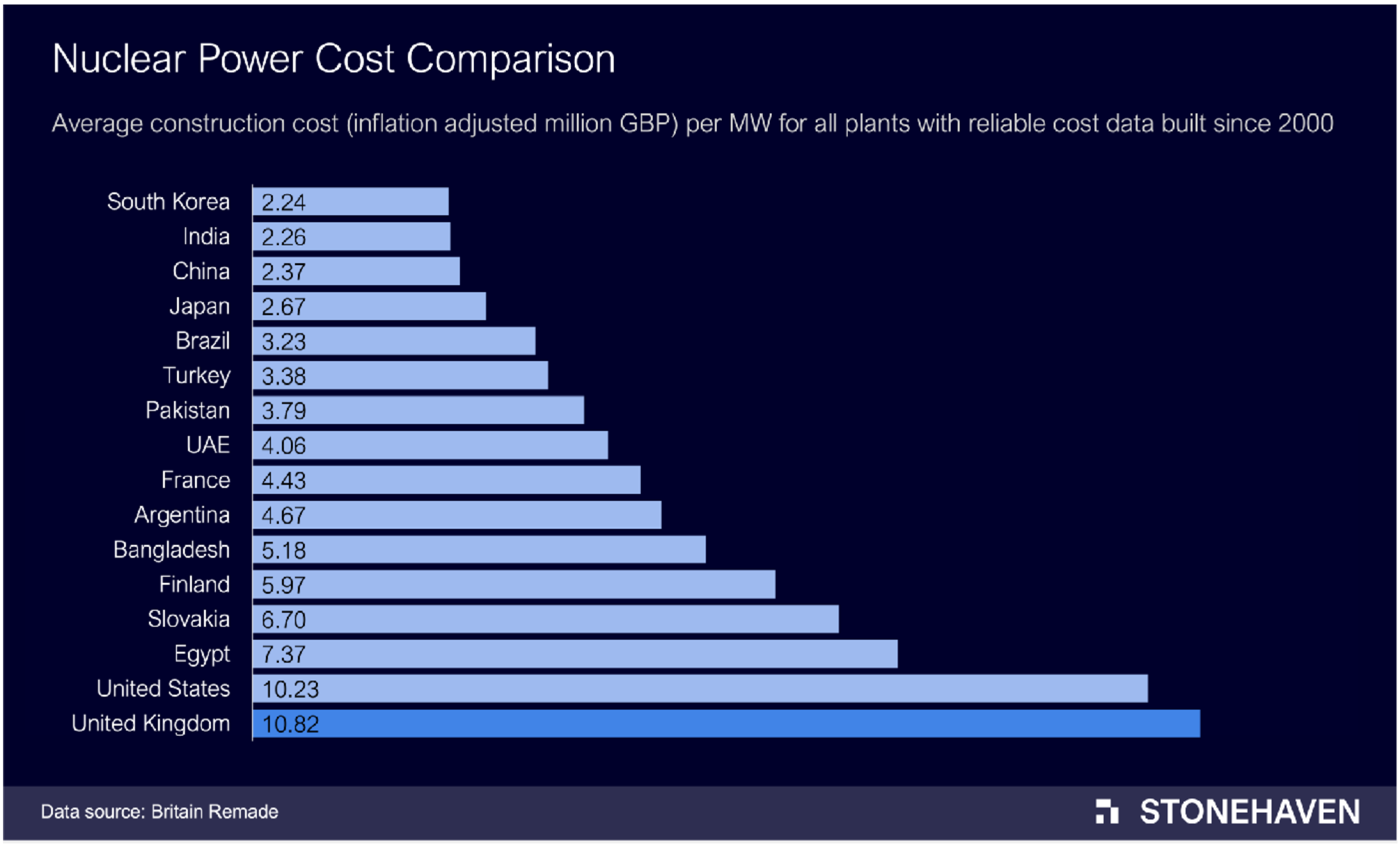
Overcoming capital and regulatory hurdles

To compete globally on new nuclear, the main hurdle for the US and UK is financing, for what are highly capital intensive technologies.

Without the initial fiscal capacity to build at the rate of China, it will be key to create a demand pipeline. This should come from energy intensive industries that will benefit from baseload nuclear power, through offtake agreements, or outright project ownership. While the state can absorb some of the upfront risk, having such a pipeline in place would allow capital to be recycled over time, to support further rounds of build-out.

At the same time, this will have to be supported by regulatory reform to enable reactors to be commissioned and built at high speed and low cost in both countries. The two countries are currently the most expensive places in the world to build new nuclear plants (see Fig. 1), not only due to uncertain fiscal support for construction, but also permitting, planning, environmental and safety restrictions that require projects to undergo lengthy review processes.[10] Cooperation, through demand pooling and resource sharing, could bring down this cost significantly.

Figure 1: Nuclear Power Cost Comparison



A transatlantic SMR / Gen IV Program

Consequently, the first element of a new agreement should be the enabling of a transatlantic strategic program, focusing on two selected reactor designs. This initiative would address two barriers to delivery – accessing credit and reducing project costs.

Improve access to credit

There are significant costs associated with First-of-a-kind (FOAK) deployment and development. At Hinkley Point C, financing costs contributed two-thirds of the cost to consumer.[11] Reducing investment uncertainty is therefore critical to lowering the cost of capital.

Novel projects incur high levels of uncertainty. US and UK governments have both offered signals to reduce this uncertainty, including the USA's Advanced Reactor Demonstration Program and Gen III+ SMR Program,[12] and the UK's SMR competition.[13] However, there was consensus among stakeholders that these incentives provided insufficient clarity over which technologies would be in demand at what point.

Reduce project costs

Under the status quo, reactor designs must undergo regulatory approval in each market. This limits the ability of firms to achieve economies of scale when moving into new markets, which increases project costs. Similarly, in-market site licensing and permitting procedures contribute significantly to the high cost of nuclear power project (NPP) deployment in both markets. All stakeholders agreed that these challenges must be addressed to bring down NPP costs, and commended efforts by the UK's Office of Nuclear Regulation (ONR) and USA's Nuclear Regulatory Commission (NRC) to deepen cooperation. Regulatory cooperation (addressed later in this paper) can introduce efficiencies in time and cost, both in the short and long term.

This was considered problematic, given the following assumptions:

- Firstly, Governments (which have limited capacity) will need to support industry in overcoming FOAK and developmental risks. While stakeholders differed on the extent to which this could be absorbed by the private sector, there was broad agreement that Government would need to play a role, and consequently that "tough decisions" will need to be made to limit the number of models receiving direct government support. Without this decision-making, interviewees warned that the UK would provide insufficient security in the demand pipeline, or overextend itself on commitments. This would risk "losing out" on being an early-mover in deploying advanced reactor designs, and could dilute the impact of early investments.
- Secondly, stakeholders agreed that supporting too many technologies risks losing the modular, and thus cost and time saving, benefits of SMR and advanced reactor designs. Multiple US reactor manufacturers raised concerns about the regulatory challenge of approving reactors individually, rather than as an entire fleet, in the UK. This approach was seen as being incompatible with modular designs.

Taken together, these assumptions reflect a suboptimal market for investing in advanced reactor designs, with the result limiting access to, and increasing the cost of servicing, credit. Both industry and policy stakeholders want supportive policies on a narrower set of designs, and accept that industry should absorb FOAK risk on these designs. Alongside these measures, industry recommended leveraging export finance to help absorb FOAK and developmental risk.

Key actions for government and industry stakeholders

To bring this vision to life, a concerted effort from both governments and industry stakeholders is essential. Key actions include:

Establish a technology consortium

The US and UK should select a limited number of reactors, on which they initially agree to support development and deployment costs. Concentrating efforts on fewer reactors will support efficient supply chain management and offer clearer investment signals. This should be designed with the opportunity to extend collaboration with future friendly partners (e.g., Canada). The UK could build on the current GBN technology selection of two reactors to establish a "technology consortium." Once the program has successfully commenced (and a critical mass of reactors are online), this model can then be replicated for future technologies.

Create shared orderbooks

The program should focus on the two countries agreeing on "sister" orderbooks, which provide clear demand signals on the volume of, and timeline at which, reactors will be deployed within the next 15 years. This should be designed to allow the development and sharing of supply-chain resources, including labor and manufacturing.

By executing shared orderbooks in parallel, parties can distribute risk more widely, reduce financing difficulties, and improve the chances of co-financing and syndicating investments. Parties can include reactor developers, offtakers, EPC firms, and entities from the home country, supplier country, and third countries. Pooling risk in this manner is especially important when scaling from FOAK to further reactors, as cost and schedule uncertainties are typically more pronounced in the early projects of an orderbook.

Domestic policy changes, including enabling authorities to improve fleets (in lieu of individual reactors), may be required to enable this. Collaboration with the private sector and utilities will also be necessary to create a pipeline of offtakers for SMR electricity, helping to guarantee demand.

One avenue to consider is a Joint Venture (JV) between government (or a government body, such as GBN), a reactor vendor and an industrial offtaker, who would agree on an Advanced Market Commitment (such as a firm looking to develop a data center). This third party (the industrial offtaker) would offer a new, higher level of demand and financing certainty. Opportunities for a transatlantic structure, with joint US/UK Government ownership, could also be considered. This could unlock deeper collaboration, regulatory harmonization, risk standards, and export credit support.

The JV would be tasked with developing a fleet of modular reactors. The government body would provide strategic direction and regulatory, licensing, and permitting support, while the offtaker would secure demand for the first reactor. This would reduce financing risk and cost. Finally, the vendor would provide the technological experience and IP. The vendor and government body could also re-deploy relevant supply chains and workforces between sister orderbooks. We discuss the supply chain implications of this in Pillar II.

Unlock export credit

Shared and integrated supply chains in the UK and US focused on a limited set of common reactor designs, in theory, open the possibility of export credit agencies (ECAs) playing roles in driving sister orderbooks in the two countries, via reciprocal financing streams. A new framework agreement between US Export-Import Bank (EXIM) and UK Export Finance (UKEF) could broaden access to export credit, reduce financing costs, and overcome initial risk barriers for innovative reactor technologies. This could include:

1. **Coordinated content requirements:** Strict interpretation of export facilitation mandates have resulted in ECA policies that limit financing to only the extent of domestic content in the final product or project. Alignment between EXIM and UKEF on mutual content requirements for specified/relevant transactions could enable both ECAs to play larger roles in the financing of SMR/AMR sister orderbooks in the UK and US.

2. **Alignment on risk standards:** Both EXIM and UKEF can coordinate on the alignment of risk standards, calibrating risk appetite/tolerance to levels necessary to drive orderbooks of SMR/AMR projects. Specific actions could include re-establishing 95% risk cover for all sovereign borrowers, developing and standardizing credit support as alternatives to direct sovereign guarantees, and agreeing upon a credit criterion for limited recourse project finance, to aggressively promote SMR/AMR projects (e.g., cost overrun guarantees, lower equity requirements, more favourable repayment profiles).

3. **Revision of local cost rules:** Nuclear facilities are very local cost intensive. Generally, such facilities spend at least fifty percent of their total costs locally. The US and UK can coordinate a revamping of the OECD local cost rules to expand them to match these realities for SMR/AMR projects.

ECAs have a history of making policy exemptions to support strategic sectors, national interests, and enhance export competitiveness. For instance, the EXIM's 5G program helps level the global playing field in 5G technology against China, while ECA untied financing has helped countries secure critical mineral supplies.[14] The US and UK could leverage similar flexibility to finance SMR and AMR projects, pursuant to advancing shared geopolitical and national security objectives. This approach would meet domestic demand, and increase the competitiveness of both countries in global markets by advancing reactor designs.

The involvement of EXIM, UKEF, and other public financing (e.g., US Department of Energy's Loan Programs Office [LPO]) could incentivize and encourage the participation of third-country ECAs in the sister orderbooks, further broadening the risk pool. Multiple ECAs can co-finance projects, and ECAs can also enter partnerships with other public finance institutions. For example, UKEF can partner with the LPO to finance US orderbooks, while EXIM could partner with the National Wealth Fund (NWF) in the UK.

Share development costs

There is an opportunity to pool existing export credit funding into a super development fund for a limited number of agreed upon countries each year (similar to Project Phoenix at US State Department). For example, a $400 million per year fund could distribute $100 million to a selected project to pay for early engineering, reactor siting, reactor selection, training, and other essential pre-project activities. These funds would be repaid from export credit agency loans once the project begins, and recycled into future development funds.

Pre-select and consent sites

Governments must expedite the identification and pre-selection of suitable sites for SMR deployment, including securing necessary licenses and approvals. Contracts should be designed to address industrial demand for electricity and heat, aligning SMR deployment with broader energy system needs. It is essential to ensure that the permitting, regulatory, and financing processes can proceed at a pace that meets urgent power supply demands.

Streamline regulatory assessments

By focusing on a few reactor designs, regulatory bodies like the ONR and NRC can concentrate their limited resources and staff on specific technologies. Thus, the "technology consortium" approach speeds up nuclear development by streamlining both regulatory and developmental efforts. The goal of this cooperation is to develop a joint regulatory framework that aligns approval processes, enabling mutual recognition of licenses and accelerating the deployment of SMR and Gen IV technologies.

Collaboration between US and UK regulators is key to speeding up approval for reactor designs by preventing duplication in regulatory assessments. The cooperation between the US NRC and Canada's CNSC on the GE-Hitachi BWRX-300 review serves as a potential model for ONR-NRC cooperation.[15] Such collaboration could include an exchange program where technical staff from both regulators can observe and learn from licensing processes, including conducting "shadow reviews."

Initial technical cooperation and information sharing between the ONR and NRC can offer multiple benefits beyond speeding up approvals for FOAK designs. According to industry reports,[16] these benefits include supporting regulatory efficiency and modernization in both the UK and US, improving near-term results by limiting the number of involved regulators at the outset, and laying the groundwork for long-term licensing reciprocity and harmonization.

Therefore, a plan for UK-US regulatory cooperation should build upon existing bilateral and multilateral memoranda of cooperation,[17] focusing on:

1. Formal and explicit cooperation on design-specific reviews of a limited set of reactors, via the "technology consortium."

2. Formal and explicit establishment of longer-term objectives of reciprocity and harmonization. This should recognize that cross-country collaboration has been achieved in other sectors, and offers relevant lessons.

The advantages of UK-US regulatory cooperation, as outlined, would include:

- Acceleration of the review process of FOAK reactor designs as determined by the "technology consortium."
- Establishment of interpersonal connections and relationships between regulatory bodies.
- Strengthening trust in technical competency and technical evaluations of the peer regulator.
- Building upon technical cooperation and increased mutual trust to facilitate concurrence on regulatory decisions: perhaps initially on safety evaluations where existing requirements already align well. This could progress to a mutual recognition of licensing approvals, which could either be partial (e.g., shortened ONR review for NRC-approved designs, and vice versa) or full harmonization.

PILLAR 2
04 A geopolitically secure supply chain

Pushing through the trade barrier

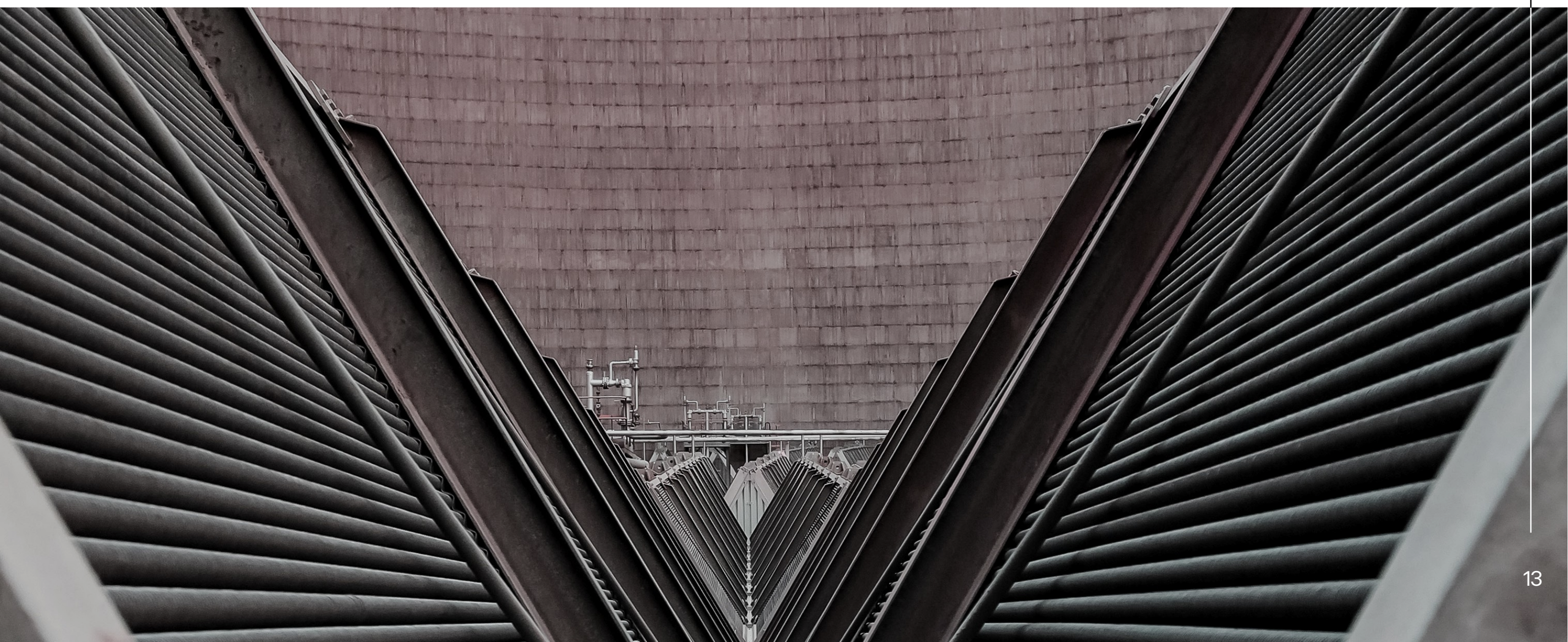
Despite the political and economic opportunities for US-UK collaboration outlined above, realizing these benefits is contingent on a smooth trade relationship between both countries.

An enhanced US-UK cooperative framework must therefore include bilateral agreements and guarantees that trade for use in nuclear energy can proceed tariff-free, quota-free, and that other non-tariff barriers (NTBs) are removed across all relevant sectors. Any sectoral trade agreement for nuclear cooperation and supply chains must be written to ensure that Foreign Entities of Concern (FEOCs) will not benefit from such an agreement, for example, in the procurement or manufacturing of nuclear goods and services in third countries.

While nuclear energy remains a priority for the new US administration, given its "America First" mantra, it is expected to impose tariffs on a range of commodities and supply chains around the world.

In his first term, President Trump positioned nuclear energy as a top policy priority, a national security issue, and an area of competitive advantage.[18] While it is anticipated that the current Administration will limit federal support for other clean energy technologies,
it is expected that nuclear will remain a priority. Upon inauguration, Trump issued an Executive Order on "Unleashing American Energy"[19] which calls particular attention to removing "undue burdens" on nuclear energy and explicitly adding uranium to critical minerals lists.

While the Trump Administration is clearly pro-nuclear, stakeholders were clear that the extent of support would be commensurate with the economic benefits to US society and national security. It is therefore important to enable free trade of critical nuclear materials among the US, UK, and their allies, while coordinating on appropriate trade controls to mitigate collective dependency on FEOC supply chains. This will help keep the costs of nuclear build-out low, and avoid the need for large subsidies.



The US and UK could further benefit from shared supply chain agreements with third countries, to access supply chains that China and Russia might otherwise dominate. To the highest extent possible, it is vital that any sectoral trade agreement eliminates FEOCs from nuclear supply chains. However, both Russia and China are key trade partners in certain sectors, such as fuel and heavy forgings. To this extent, any agreement should collectively benefit the economies of the US and UK (plus allies), while limiting benefits to FEOCs.

Considering China's massive industrial capacity in nuclear-relevant sectors such as heavy forgings and steel (see Figs. 2-3), US-UK supply chain integration, and the trade agreements to underpin this, should be considered an essential pathway towards enhancing collective competitiveness vis-à-vis China in the global market.

Because the US and UK have comparative advantages in complementary areas,[20] they can also ensure supply chain security while simultaneously reducing dependence on Russia (which, as shown in Fig. 4, dominates global fuel supply).

Figure 2: China's share of global steel production

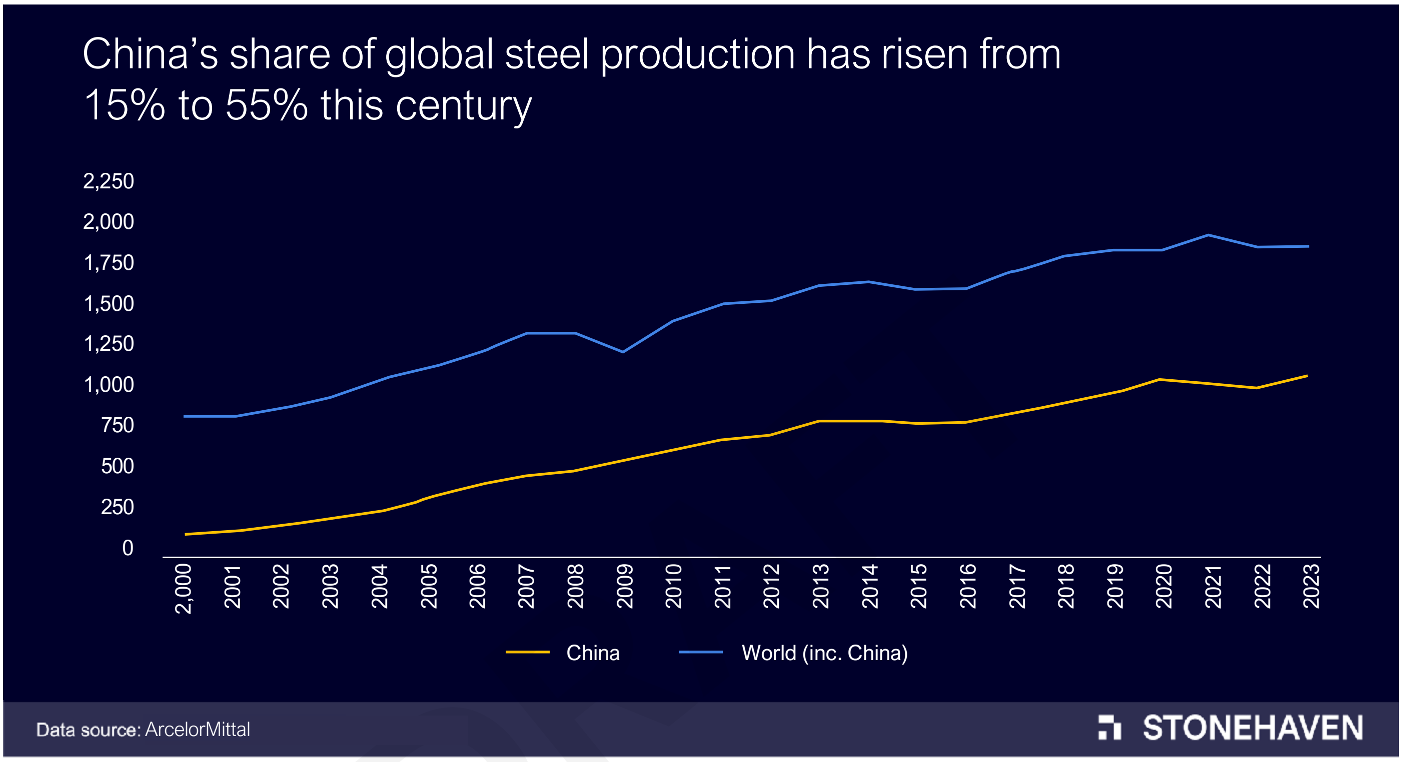


Figure 3: Major steel-producing countries in 2023

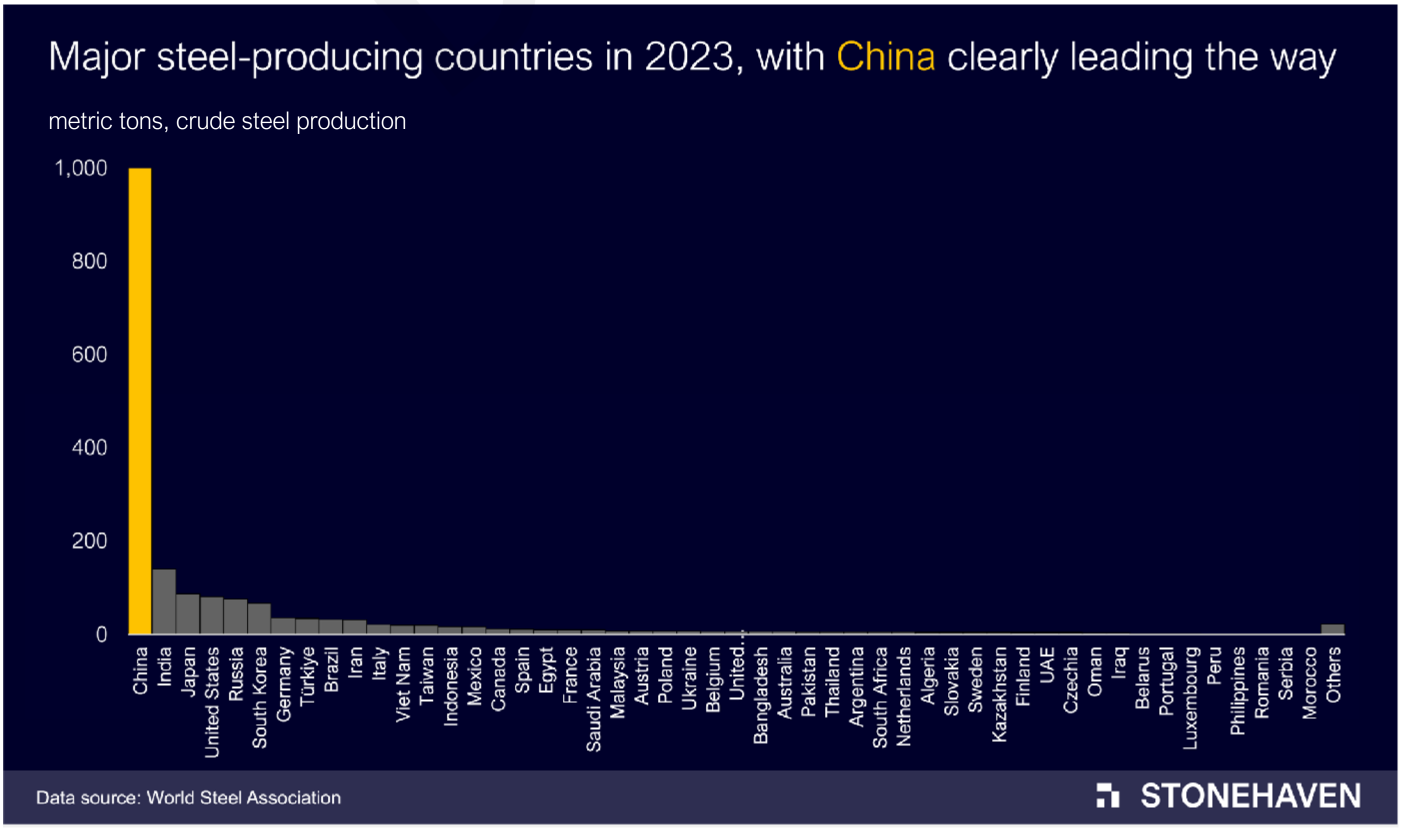
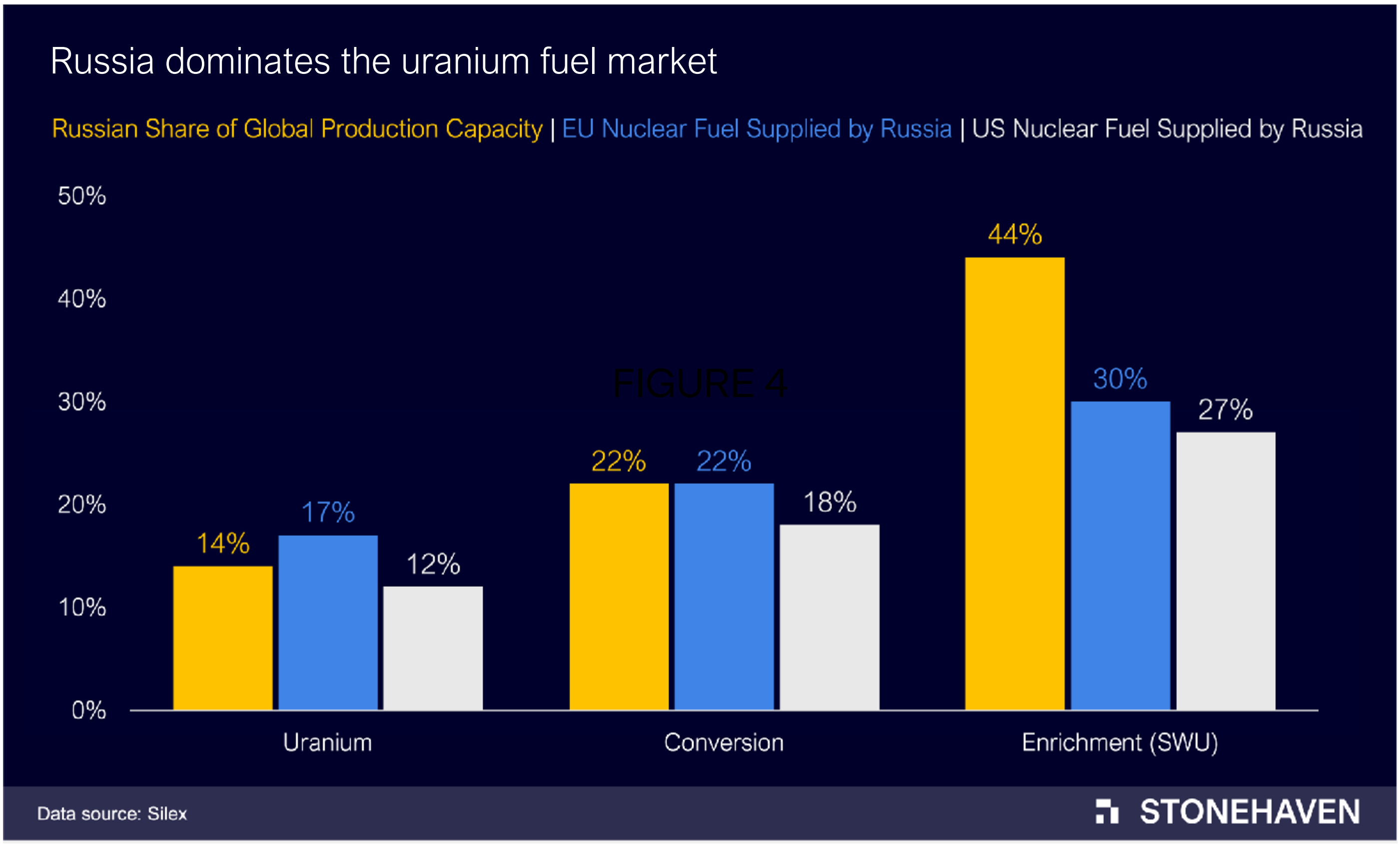


Figure 4: Russia dominates the uranium fuel market



Tariff-free trade on nuclear

Most stakeholders agreed that a future demand pipeline (see Pillar I) would be critical to securing both fuel and reactor supply chains from Russian and Chinese influence and realizing the associated economic benefits.

In particular, the UK was identified by both US and UK stakeholders as having significant expertise and capacity in decommissioning, nuclear fuel enrichment, nuclear fuel transport, and steel manufacturing.

Multiple American firms identified the UK as being an opportune "base" from which to "launch" their technology into European markets. They suggested, however, that this opportunity would not be realized without an initial British demand pipeline and associated supply chain reinforcement. The recommendations in Pillar I should therefore also be complemented with support for geopolitically-secure nuclear supply chains, and leveraging significant government investments into Western fuel capabilities.

Key actions for government and industry stakeholders

The below recommendations aim to capitalize on the competitive advantages of both the US and UK to displace Russian and Chinese supply chains, thereby harnessing economic benefits for both nations.

Tariff harmonization

The US and UK should work towards harmonizing tariffs (and other trade barriers) on nuclear fuel and supply chain materials from Russia and China. This is an essential step towards reducing cost barriers and developing secure and stable supply chains.

The two countries should also ensure that a comprehensive bilateral trade deal, or bespoke sectoral trade agreements, include robust tariff-free and quota-free trade on nuclear fuel and reactor supply chain goods and services. This should cover the entire lifecycle from fuel supply, to spent fuel disposal and plant decommissioning. This can enhance sustainability and efficiency.

Mapping and strategically developing critical sectors

The US and UK should conduct a comprehensive mapping of existing supply chains and areas of expertise across the nuclear lifecycle, from procurement to waste management, to identify collaboration opportunities, optimize resource use, and establish secure trade corridors through shared infrastructure and connectivity. This will illustrate specific areas in which both nations have competitive advantage, and where there is mutual need for more investment.

Using this map, investment funding can be targeted into specific parts of the reactor and fuel supply chains. Investments can be directed to specific segments of the supply chain via several policy mechanisms. These include direct government investment and structured incentives (e.g., tax credit eligibility rules, planning and permitting support, skills and training programs, etc.). Such steps can accelerate the commercial availability of certain critical inputs, such as high-assay low-enriched uranium (HALEU), the essential fuel for AMR designs.

Taking steps to build out complementary and integrated supply chains in both countries ensures that the economic benefits of enhanced cooperation are shared, making the broader civil nuclear partnership more durable. Moreover, a US-UK integrated SMR/AMR supply chain establishes the basis for leveraging export credit finance and reciprocal financing streams via ECAs.

The agreement should also consider expanding the joint funding models and/or joint ventures proposed in Pillar I to finance investment into the above areas. As the agreement develops, a joint funding model could be extended to other friendly nations. This model could cover the sourcing and conversion of uranium, paired with expansion of strict controls on Russian and Chinese imports, to squeeze adversaries out of friendly supply chains.

Reciprocal workforce development

The US and UK should establish a reciprocal nuclear skills visa program to facilitate workforce mobility, enabling professionals to work across borders, address skill shortages, and enhance collaborative efforts in nuclear projects.

PILLAR 3
05 Securing long-term growth

Bridging the innovation gap

The global race for leadership on cutting-edge nuclear technology has exposed an R&D and innovation gap between China and Russia, and the US and UK.

China, as part of a fourteen-fold increase in broader R&D spending since 2000,[21] has aggressively pursued the development of SMRs and Gen IV nuclear technologies. China's state-backed nuclear corporations, such as China National Nuclear Corporation (CNNC) and China General Nuclear Power Group (CGN), have invested heavily in SMR projects like the HTR-PM (a high-temperature gas-cooled reactor) and CAP200. As mentioned above, it has constructed the world's first commercial SMR Gen IV reactor demonstration, the gas-cooled Shidaowan-1 in Shandong province.

Similarly, Russia has made substantial progress with SMR projects, notably the Akademik Lomonosov, the world's first floating nuclear power plant. Russia is also advancing Gen IV reactor designs, including sodium-cooled fast reactors (such as the BN-800) and lead-cooled fast reactors, which are central to its long-term energy strategy. These projects are supported by substantial state funding and a clear vision to export these technologies worldwide, thereby extending Russia's geopolitical influence through energy partnerships with countries in regions such as Eastern Europe.

Leveraging the special relationship

Despite this potential gap, the US and UK retain significant strengths in nuclear knowledge sharing and research collaboration. Research cooperation was mentioned by several stakeholders as a strong point of the US-UK civil nuclear relationship. Many interviewees also referenced AUKUS as symbolic of both the depth and the potential of the relationship to drive delivery on novel and sensitive technologies, including in civil nuclear. Stakeholders recognized that the nature of the relationship between the US and the UK puts the nations in a "very unique" position from which to cooperate further on civil nuclear.

For civil nuclear, however, many stakeholders felt that bridging the gap between research progress and commercialization remained challenging.

The recommendations below explore how the two nations can cooperate to strengthen competitiveness overseas, further influence the market for future technologies, and reap the associated supply chain benefits. This is particularly relevant in countries considering (re)launching nuclear power programs, who have not yet determined which technologies on which they will focus – including in Central and Eastern Europe, Africa, and Latin America.

Key actions for government and industry stakeholders

Leverage bilateral cooperation and capital markets to drive expansion in third country markets

The US and UK could harness their strong financial markets to invest abroad, including in Central and Eastern Europe, by offering 50-75% government-backed guarantees on equity investments. The private sectors from both nations could raise funds efficiently, attract pension and insurance investments, and screen projects. They could form joint ventures with local investors and utilities to structure equity infusions and assist in securing ECA debt financing. This would mean accepting government guarantees to minimize risk while paying a fee from returns. Such tools, in concert with the de-risking of SMR/AMR technologies through an initial pipeline and orderbook in the two countries, could significantly enhance the joint competitive position of the US and UK in third markets.

As regulatory cooperation advances, the US and UK would aim to involve third-country regulators. For prospective markets, they might collaborate on capacity building, leveraging the ONR and NRC to assist emerging nations in establishing regulatory frameworks, with the UK potentially expanding its responsibilities as a co-implementer for the US State Department's FIRST Program. Moreover, the US International Development Finance Corporation (DFC) and British International Investment (BII) could enhance their roles in third-country markets, such as in Africa and Southeast Asia, by modernizing BII's nuclear energy policy to finance nuclear projects and removing constraints on the DFC's equity tool. Existing DFC-BII cooperation in developing nations (e.g., joint due diligence in post-conflict countries) could also serve as templates for future joint work in new nuclear markets.

The long-term promise of third-country markets could justify the initial risks of SMR/AMR deployment, offering both commercial gains and national security benefits. This strategic approach would not only support economic growth in other regions such as Central and Eastern Europe, but also enhance financial ties and position the US and UK as global leaders.

The US and UK hold a competitive edge in global financial markets. Leveraging this advantage with smart policy tools, they could mobilize the capital markets of Wall Street and London to channel investments into projects throughout the world, and secure future export opportunities.

Continue regulatory and R&D leadership in advanced technologies

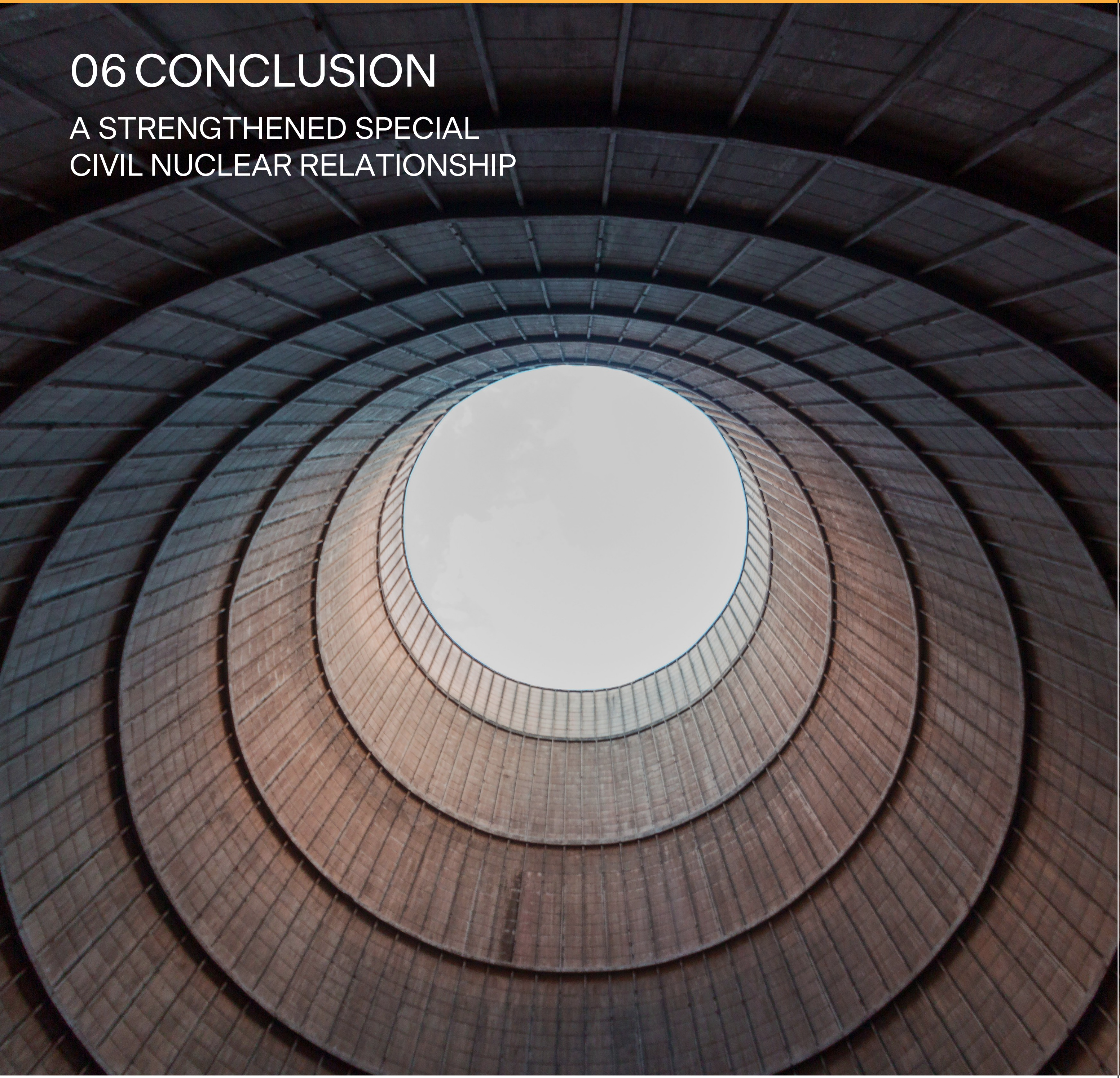
The UK accrued a first-mover advantage in fusion regulation by establishing a proactive and comprehensive framework that prioritized innovation, safety, and investment in nuclear fusion technology.[22] By being the first to implement clear and supportive regulatory structures, the UK attracted significant research and industry investment, positioning itself as a leader in the fusion energy sector.[23] Observing this success, the United States adopted similar regulatory measures, which facilitated cross-border collaboration and technological exchange.[24] The two nations should continue work to develop a global regulatory framework on nuclear fusion. This should facilitate commercialization of technologies currently under development in the US and UK and secure the nations' long-term competitiveness and expertise in this space.

Laboratories and public research institutions from both countries engage in joint programmatic reviews of nuclear-relevant research activities to facilitate coordination, limit redundancy, and maximize complementary capabilities. Enhancing this ongoing R&D cooperation, including highlighting where there may be takeaways and applications for fusion technologies from existing fission-focused research programs (given the symbiotic nature of fission and fusion[25]), could enable both countries to advance their leadership in the technologies of the future.

A major gap in the R&D systems of both countries is the shortage of test facilities and capacity, which are crucial for advancing advanced fuels and materials. By pooling investments, possibly with contributions from third countries, the US and UK could build test facilities that will help develop materials that can withstand high temperatures and resist neutron embrittlement. Developing these testing capabilities together could enhance the performance of specific SMR/AMR designs and potentially accelerate the commercialization of fusion technologies.

06 CONCLUSION

A STRENGTHENED SPECIAL CIVIL NUCLEAR RELATIONSHIP



With new governments in the US and UK focused on boosting industrial resilience and national security in a competitive world, there is a unique chance to strengthen the special relationship. As this paper has shown, civil nuclear is an area of historic partnership that should be a central part of this effort. However, the special civil nuclear relationship has declined in recent years and needs to be renewed.

SMR and Gen IV reactor technologies are key to deepening and leveraging work on existing reactor programs. With access to low-cost, reliable energy being vital to growing manufacturing capacity and advanced tech industries such as AI, these technologies will play a major role in ensuring national security and economic resilience.

It is imperative to the long-term geopolitical and security interests of both countries to avoid relinquishing global influence in nuclear energy and the strategic industries of the future. By agreeing and then implementing a joint agreement, the US and UK can set a global benchmark for successful international cooperation in the nuclear energy sector.

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