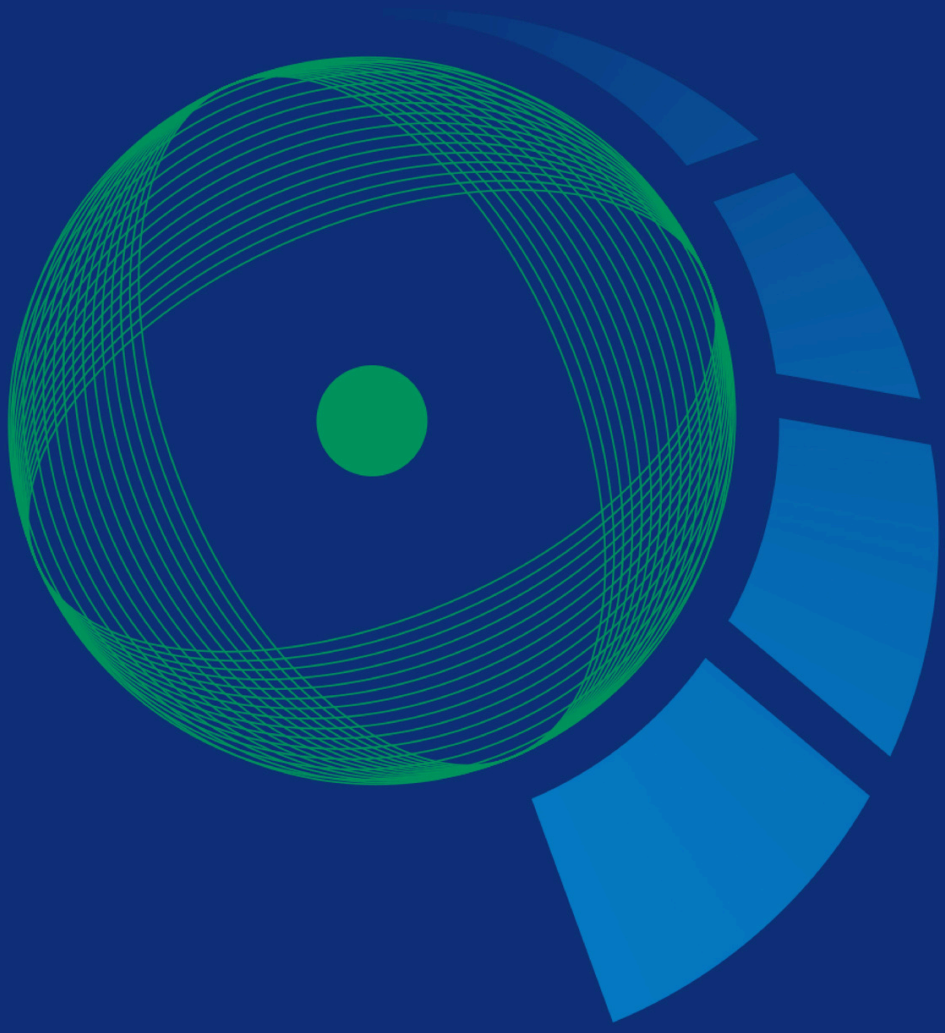
ACCELERATING SMRs

An Initiative of the Nuclear Energy Agency

2024-2025 Review & Priorities



OECD

NEA
NUCLEAR ENERGY AGENCY

SMRs are a new wave of nuclear technology that is poised to provide clean and reliable energy. By ensuring cooperation between governments and the private sector, we can address challenges and unlock the potential of SMRs to deliver clean baseload power and high-temperature industrial heat essential for industrial production.

Their scalability and suitability for remote or off-grid locations further make them critical to achieving a balanced energy transition while enhancing energy independence and resilience against global disruptions

NEA Director-General William D. Magwood, IV

OVERVIEW

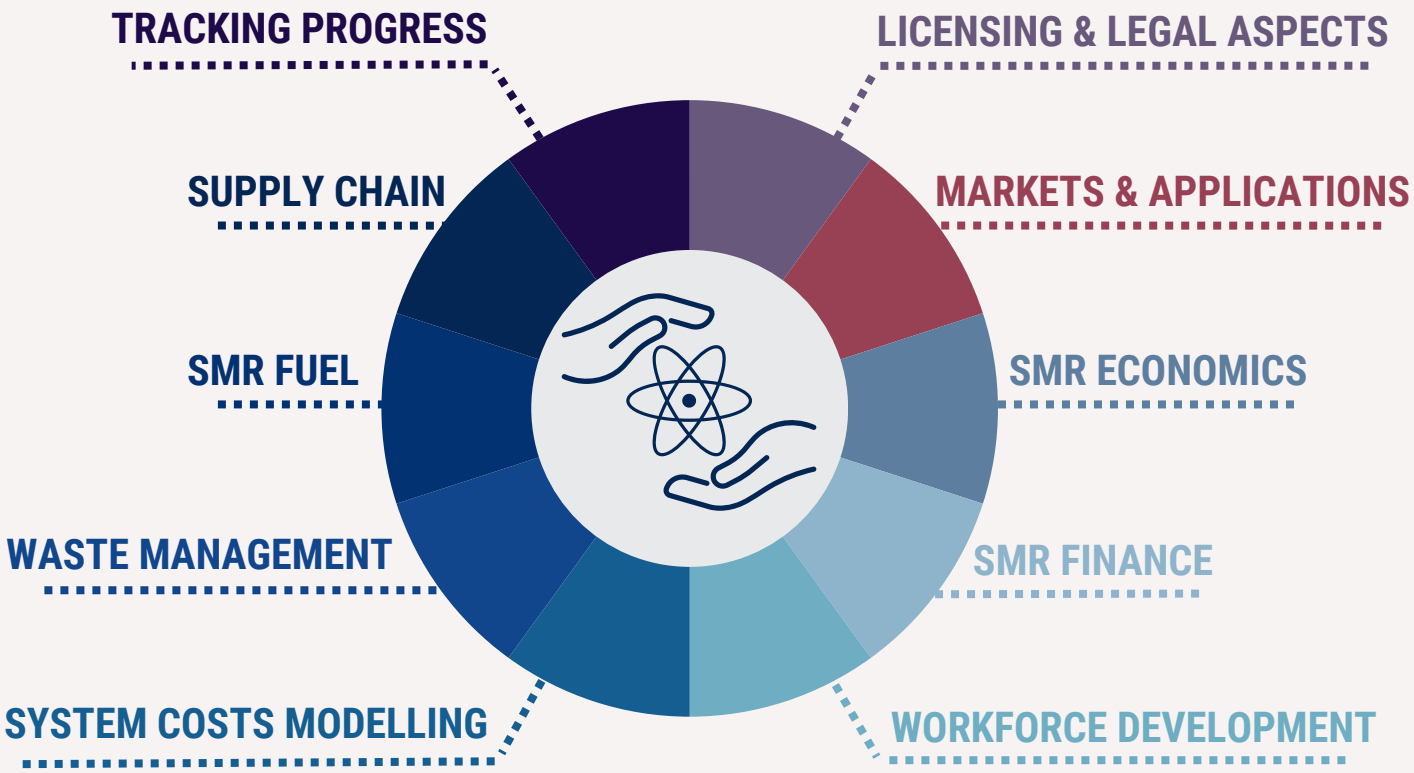
The Nuclear Energy Agency (NEA) is proud to lead the ACCELERATING SMRs INITIATIVE, a solutions-oriented platform designed to help decision-makers unlock the full potential of Small Modular Reactors (SMRs) as a cornerstone technology for the energy transition. Through the iterative efforts of our expert team and a well-established network of industry leaders, government officials, researchers, and policymakers, the initiative delivers impactful strategies to drive SMR adoption.

By combining targeted activities, cutting-edge research, and collaborative events, the initiative generates actionable insights and fosters innovative solutions to address the challenges of deploying SMR technologies. It equips decision-makers with the tools needed to overcome barriers and ensures that SMRs can provide clean, reliable energy for a wide range of applications, from industrial processes to powering remote communities

Launched at the **COP28 Presidency's high-level "ATOMS FOR NET ZERO" event**, the Accelerating SMRs initiative quickly captured the attention of prominent government and industry leaders, uniting them around the shared vision of harnessing SMRs to drive the energy transition. This bold commitment to innovation and collaboration was showcased at the initiative's inaugural event: a Public-Private Roundtable on SMR Finance, co-organized with the Atlantic Council and Nuclear Energy Institute (NEI) and with the participation of McKinsey & Company.
This gathering set the tone for a dynamic initiative that continues to bring together expertise, influence, and ambition to accelerate the deployment of SMR technologies on a global scale.

PRIORITIES

Accelerating SMRs will continue to focus on pragmatic tools, analyses and policy recommendations to help inform policy and investment decisions by governments, industry and the financial sector. Priorities include:



SMR DASHBOARD

The NEA SMR Dashboard is an **Accelerating SMRs' flagship publication.** The NEA SMR Dashboard looks beyond technology readiness level and assesses progress across six additional enabling conditions: licensing readiness; siting; financing; supply chain; engagement; and fuel. The most recent edition of the Dashboard, published in March 2024, provides a comprehensive assessment of progress towards commercial deployment of SMRs around the world.

ENABLING CONDITIONS FOR SUCCESSFUL DEPLOYMENT

Momentum for SMR development and deployment continues to build, with over 60 SMR designs under active development in North America, Europe, and Asia. Beyond electricity generation, these SMRs offer industries new options to **secure their energy supply.**

For these reasons, demand for SMR technologies is growing around the world, with new private sector customers coming forward from petrochemical, mining, shipping, and information technology, among other sectors.

NEA is uniquely positioned to support like-minded governments seeking to keep pace with the private sector by creating the conditions to enable SMR innovation and commercialisation.

NEA provides authoritative data, analysis, and advice to decision-makers, and **fosters public-private collaborations** to accelerate the deployment of SMR technologies.

Beyond technical feasibility, there are several other **necessary conditions for the success of SMRs.** The **Figure: *SMR Pathways: Technology to Market*** illustrates the essential enabling conditions for successful commercialisation of SMRs. From research and development of various SMR technologies to deployment in real-world markets and applications. Several enabling conditions connect the technology push side of the landscape with the market pull for innovative nuclear technologies. NEA is working with partners to create the conditions to accelerate the successful deployment of SMRs.

TECHNOLOGIES

Several **innovative nuclear concepts** are currently under active development, nearing commercialisation and deployment.

Some are based on traditional Light Water Reactor (LWRs) concepts while others are Generation IV concepts, many of which use new coolants and moderators.

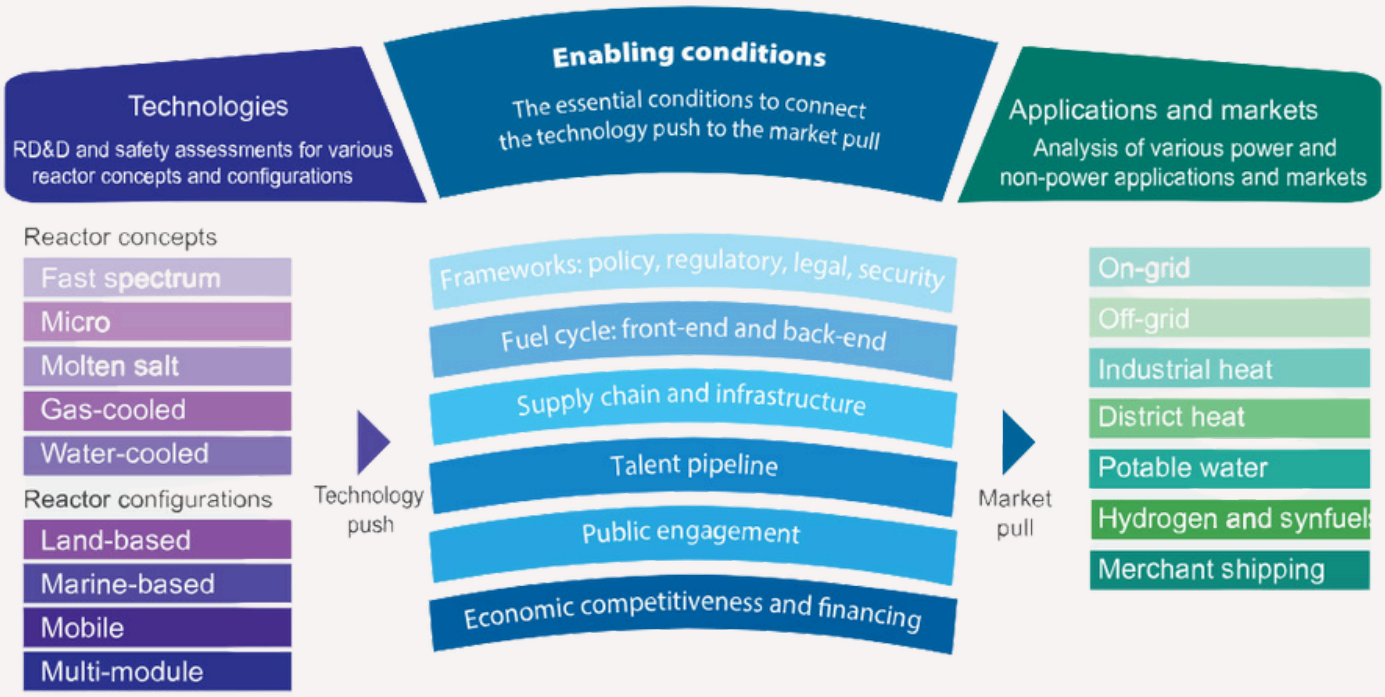
Various reactor configurations are also envisaged, with both land-based and marine-based approaches proposed, as well as mobile and multi-module configurations.

STRATEGIC PARTNERSHIPS

Strategic partnerships will be key to successful technology development, as the **centre of gravity** for nuclear technology development shifts towards the private sector.

Collaborations with national laboratories and research institutions will continue to be essential for successful research, development and demonstration, as well as safety assessments and access to critical research infrastructure.

SMR PATHWAYS: TECHNOLOGY TO MARKET



MARKETS

Markets are signalling the need for innovative technologies to address strategic energy priorities, including in **hard-to-abate industrial sectors.** On-grid power generation to replace coal presents a key market around the world for SMRs and Generation IV reactors. However, several other markets are signalling interest in SMRs and Generation IV reactors: **off-grid heat and power** to replace diesel generators in remote regions, including for mining operations; high temperature heat to replace fossil fuel cogeneration in heavy industries such as chemicals processing and potash production for the fertiliser industry; and marine propulsion to replace bunker fuel for merchant shipping; and power for data centres. These markets represent emerging – and often disruptive – applications of nuclear energy technologies.

ENABLING CONDITIONS

Near-term policy and investment decisions will play a key role in shaping overall market outcomes. There are several enabling conditions for success to connect supply and demand. Technologies must be a good fit to connect with the specific market applications. **Governments and international organisations** have a role to play in **creating the enabling frameworks** – including policies, regulatory readiness and legal aspects. Safe and secure SMR fuel supply chains are essential, as is a responsible plan for the management of the back end of the fuel cycle. Similarly, supply chains more broadly and infrastructure, as well as human resources, a pipeline of talent, public engagement and trust are all essential enablers of SMR and Generation IV reactor innovation. Equally importantly, competitive costs and access to public and private financing are required to enable demonstration and deployment of nuclear innovation.

ACCELERATING SMRs IN 2024: KEY ACHIEVEMENTS

SMR ECONOMICS WORKING GROUP

Ottawa, February 2024

This workshop assessed **recent progress in SMR deployment** and discussed how different policy frameworks, deployment strategies and delivery models will influence the overall economics of SMRs. Jeff Labonté, Associate Deputy Minister of Natural Resources Canada, provided the keynote remarks for the event which was attended by **over 130 expert participants from around the world.**

WORKSHOP ON SMRS FOR MINING DECARBONISATION

Toronto, March 2024

NEA and Deloitte co-hosted an event titled ***"SMRs to Support the Decarbonisation of the Global Mining Sector,"*** drawing 118 participants from 70 organizations, including stakeholders such as mining energy end-users, financiers, insurers, and SMR technology developers. The discussion focused on **how SMRs can address the mining sector's energy challenges** while advancing its sustainability performance and objectives.

DIGITAL DASHBOARD DESIGN WORKSHOP

Washington, March 2024

NEA convened a workshop during the U.S. Nuclear Regulatory Commission's Regulatory Information Conference (RIC) to explore the **development of a digital version of the NEA SMR Dashboard.** Participants engaged in a roundtable discussion addressing critical design questions, including format, update schedules, data visualisations, functionality enhancements, and the balance between detailed content and concise summaries.

REGULATORY WORKSHOP ON NUCLEAR SUPPLY CHAIN

Paris, March 2024

NEA's newly established **Working Group on Supply Chain (WGSUP)** organised a workshop to explore opportunities to resolve challenges related to **supply chain oversight practices** and **examined potential risks** that the nuclear industry will need to consider ensuring safe and reliable nuclear operations.

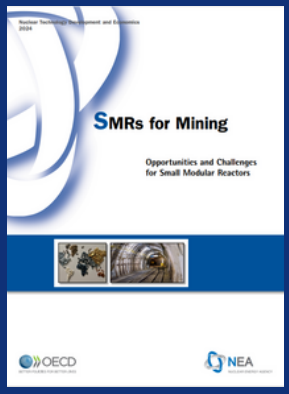
NEA WISARD WORKSHOPS

Paris, March 2024 & Orlando, May 2024

NEA launched an ambitious **Joint Project on Waste Integration for Small and Advanced Reactor Designs (WISARD)** in 2024 to examine the back-end implications of innovative nuclear systems in areas such as treatment and recycling, storage, transportation, and disposal, supporting efforts to ensure long-term sustainability. Following the **WISARD kick-off workshop** held in Paris on 25-27 March 2024, the NEA organised a **second follow-on workshop** bringing together over **50 participants from more than 10 countries**, both onsite and online.

ACCELERATING SMRs IN 2024: PUBLICATIONS

Read the report:



Read the report:

WORKSHOP ON FINANCING NUCLEAR POWER

Prague, June 2024

Co-organised with Czechia, the Financing Nuclear workshop brought together **leading experts** in nuclear energy, electricity market design, and infrastructure financing with **decision-makers in energy policy**. The proceedings presented a number of **financing models** to understand better the allocation they imply for **construction and price risks** and the degree to which those risks are socialised.

SMR FINANCE WORKSHOP

Paris, December 2024

NEA and the Generation IV International Forum (GIF) organised a joint workshop on SMR finance. Bringing together experts from the **GIF Economic Modelling Working Group** (**EMWG**), the **NEA Working Party on Nuclear Economics (WPNE)**, and the **NEA Working Group on SMR Economics (SMR-ECON)**, this event took stock of recent and ongoing activities in nuclear economics and finance, with a focus in particular on SMRs and Generation IV nuclear technologies, and explored opportunities for future activities and cooperation.

STRATEGIC BRIEF FOR THE STEERING COMMITTEE FOR NUCLEAR ENERGY ON HALEU

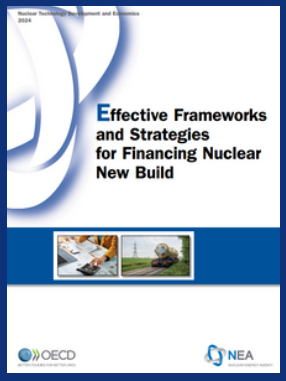
Paris, April 2024

NEA convened a Strategic Briefing on HALEU for the Steering Committee for Nuclear Energy to **brief senior officials from 28 countries** on the driving forces and implications of HALEU utilisation in the nuclear energy sector. The brief was designed to **inform policymakers about the potential advantages and challenges** associated with HALEU fuel adoption.

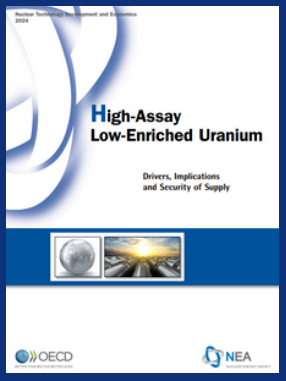
NEA AT COP29

Baku, November 2024

NEA participated in COP29, hosted by Azerbaijan in Baku from November 11-22, 2024, to emphasize nuclear energy's role in achieving global net zero targets. NEA co-hosted a **high-level panel on financing nuclear energy**, reinforcing commitments like tripling global nuclear capacity by 2050. NEA publications provided evidence-based strategies for accelerating nuclear deployment. Additionally, the NEA highlighted the **potential of SMRs for Arctic sustainable development**, focusing on their application for **remote mining and communities** during a discussion at the Arctic Pavilion.



Read the report:



Read the report:

ACCELERATING SMRs IN 2025: PRIORITIES

TRACKING PROGRESS

Building on previous successes, the **NEA SMR Dashboard: Third Edition** will deliver a comprehensive assessment of SMR progress around the world. The first **NEA SMR Digital Dashboard** will provide real-time updates on industry advancements.
In the lead- up to COP30, the NEA will launch a new report that updates the data and analysis from NEA's 2022 flagship publication **Meeting Climate Change Targets: The Role of Nuclear Energy,** which played a pivotal role in the Declaration to Triple Nuclear Energy by 2050. The new report will include an outlook for SMR deployment,

SUPPLY CHAIN

The upcoming publication, **Global Nuclear Supply Chain Readiness for Tripling Nuclear**, incorporates inputs from nuclear industry associations worldwide on global nuclear supply chain readiness.. Building on this analysis, the **Nuclear Construction Risk Conference** will address challenges from an engineering management perspective, providing a platform to explore innovative solutions and enhance project outcomes.

SMR FUEL

Amid rising global nuclear energy demand, the **NEA "Orange Book"** will analyze current and future fuel supply chains, highlighting risks and investment opportunities to ensure secure systems and support front-end capacities like enrichment and conversion. Complementing this, the **SMR Fuels: Insights, Opportunities, and Challenges** report will evaluate diverse SMR concepts and innovative fuel technologies.

WASTE AND MANAGEMENT

Work on this priority required even greater attention and thus will continue under the new international **Joint Project on Waste Integration for Small and Advanced Reactor Designs (WISARD)**, which will examine how decisions made during the front-end and design phases influence back-end strategies, aiming to support the development of sustainable nuclear systems for the future.

SYSTEM COST MODELLING

NEA is expanding its power system model, POSY, that is used for system costs modelling. POSY-II will enable modeling of SMRs in integrated power systems. The upcoming **Sweden Electricity and Energy System Costs Study** will utilize the updated **NEA POSY-II.**

LICENSING & LEGAL ASPECTS

Co-organised with the Government of Sweden, the workshop on **Bridging Law and Technology: International Workshop for the Deployment of SMRs**, will bring together legal, technical and policy experts from the government and the private sector to address the unique legal challenges posed by SMRs, transportable reactors, marine reactors, and Generation IV technologies
NEA will also convene a workshop on **SMR Safety Assessments: from Challenges to Achievements**, which will focus on strategies to address safety assessment gaps for safe deployment of SMRs innovative designs, passive systems and operating experience.

MARKETS & APPLICATIONS

The **NEA SMR Industrial Case Studies: Challenges and Opportunities series** informs policymakers about the drivers, detailed characteristics and timelines for different market applications, including chemicals production, data centres, marine merchant shipping, remote communities, offshore power generation, steel, resource extraction and desalination.

SMR ECONOMICS

The **NEA SMR Cost Drivers and Learning Curves** publication will assess strategies for achieving economies of series in SMR deployment.
The **2025 Projected Costs of Generating Electricity** report, an authoritative analysis of levelized costs (LCOE) across technologies, based on data from OECD and select non-member countries, published every five years since 1983, provides transparent, expert-reviewed insights widely used by policymakers and energy modelers. The 2025 report will include SMR costs for the first time ever.

SMR FINANCE

The publication **SMRs and ESG Financing** will contribute to an understanding of potential financing sources applicable at various stages of SMR project lifecycles. It will explore the conditions necessary for public and private financiers to engage in SMR investments, and examining the influence of both national and international policy frameworks.

WORKFORCE DEVELOPMENT

To support the tripling of nuclear energy and ensure human resource readiness for SMRs, the NEA's complementary initiative **Plan 2035** will leverage a global network and resources to expand outreach and develop educational tools. These efforts will focus on engaging individuals early, from secondary school students to young professionals, fostering interest and expertise in the nuclear field.

DELIVERING VALUE FOR GOVERNMENTS AND INDUSTRY PARTNERS

Accelerating SMRs government and private sector sponsors help guide the initiative's activities as part of a "**Public Sector Table**" and an "**Industry Table.**" NEA convened both tables in September 2024 to seek strategic direction for the initiative. Participating officials voiced strong support for activities related to the **NEA SMR Dashboard** and **Industrial Case Studies.** Economics and financing were also prominently featured in the discussions, including the need to establish robust order books for deployment at scale. Participants voiced significant optimism for near-term deployment opportunities in industries ranging **from data centres to the petrochemical sector.** Near-term priorities also include **ensuring secure fuel supply chains.**

OPPORTUNITIES FOR SPONSORSHIP

NEA **invites sponsors to strengthen and expand stakeholder cooperation at this critical time.** The NEA's goal is to apply increased funding for work across the full range of NEA activities in order to increase the ambition of key decision-makers from the government, industry and the financial sector to accelerate SMR deployment. **Partnership benefits include:**

PACKAGE	CONTRIBUTION	PARTNERSHIP
GOVERNMENT PARTNERS	Starting at EUR 100K - 500K per year	Invitation to participate in: the Annual Summit, Public Sector Table, regular workshops bringing together key stakeholders from government and industry, and the formulation of policy recommendations
INDUSTRIAL PARTNERS	**Category 1:** Starting at EUR 150K per year **Category 2:** Starting at EUR 75K per year	Invitation to participate in: the Annual Summit, Industry Sector Table, and access to industrial and systems costs case studies. Invitation to participate in fuel, supply chain and workforce development activities.
NGO PARTNERS	Starting at EUR 50K per year	Invitation to partner on events to advance mutual strategic priorities at international fora.
DEDICATED PROJECTS	Starting at EUR 100K - 500K per year	Join with other participants to fund higher-expense projects (e.g. waste integration for SMR designs, nuclear science and modelling)

ANNUAL ACCELERATING SMRs SUMMIT

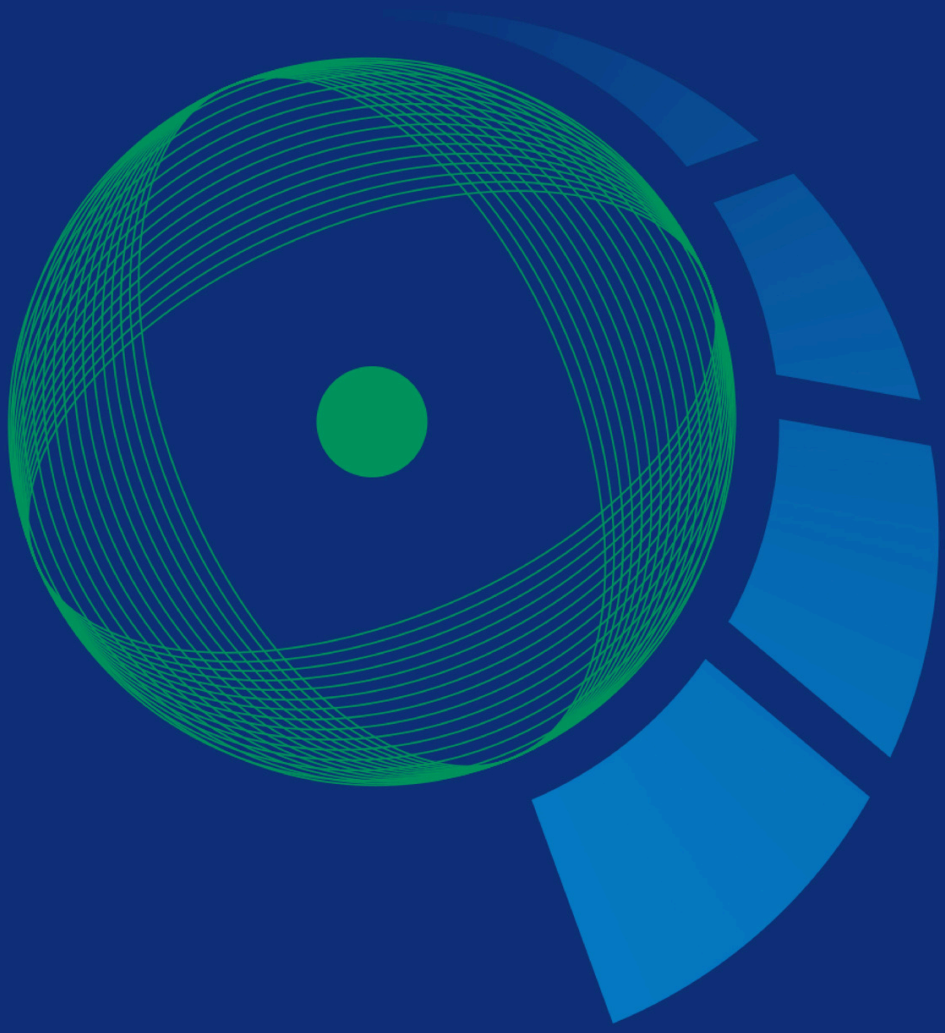
In concert with the **Roadmaps to New Nuclear Ministerial Conference**, the Annual SMRs Summit brings together **Ministers and senior officials** from nearly 30 countries and over 40 **industry CEOs** to evaluate technology impacts, potential financing frameworks, licensing and legal aspects that can impact timely and cost-effective SMR deployment.
The Summit features updates from first movers in the industrial sector, the outlook for SMR fuels, a progress report on SMR progress worldwide and a capstone public-private roundtable discussion with SMR developers, financiers and policymakers.

High-level discussions **identify and develop key policy recommendations** to ensure policy readiness and leadership focus necessary for the success of SMR technologies.

The 2nd Annual Accelerating SMRs Summit is scheduled at OECD Headquarters in Paris on September 18-19, 2025.

FOR ADDITIONAL INFORMATION OR TO JOIN ACCELERATING SMRs

SMR4NZ@oecd-nea.org
www.oecd-nea.org



OECD

NEA
NUCLEAR ENERGY AGENCY

v8