NEA
NUCLEAR ENERGY AGENCY

Developing the Workforce of Tomorrow: NEA in Action

Japan Science Council
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William D. Magwood, IV
Director-General
Nuclear Energy Agency

NEA: 34 Countries Seeking Excellence in Nuclear Safety, Technology, and Policy

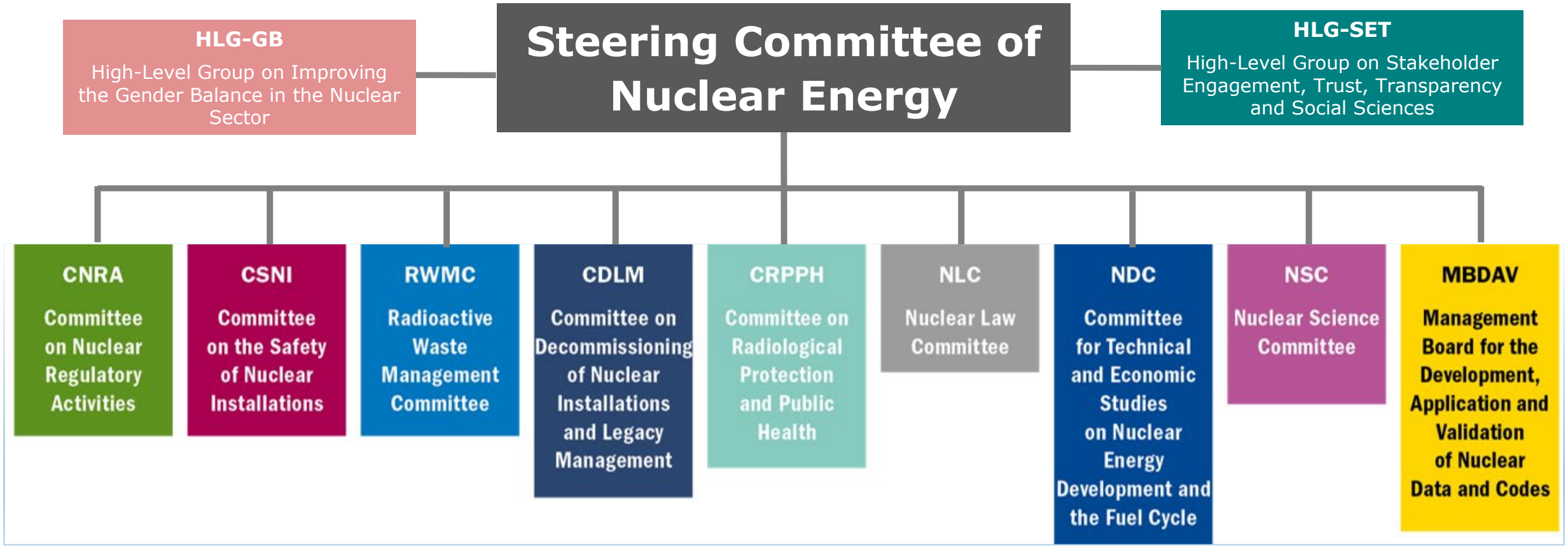
- The **premier international platform** for cooperation in nuclear technology, policy, regulation, research, and education.
- **34 member countries +** strategic partners (e.g., China and UAE).
- **More than 3500 experts** from countries all over the world **are participating in NEA activities.**
- Global relationships with **industry and universities.**

Argentina	Australia	Austria	Belgium
Bulgaria	Canada	Czech Republic	Denmark
Finland	France	Germany	Greece
Hungary	Iceland	Ireland	Italy
Japan	Korea	Luxembourg	Mexico
Netherlands	Norway	Poland	Portugal
Romania	Russia (suspended)	Slovak Republic	Slovenia
Spain	Sweden	Switzerland	Turkey
United Kingdom	United States		

NEA countries operate about 82% of the world's installed nuclear capacity

NEA: International Nuclear Cooperation at Work

NEA Committee Structure



NEA: Major International Co-operative Frameworks

NEA Serviced Bodies

Generation IV International Forum (GIF)
with the goal to develop new fission technologies with greater sustainability (including effective fuel utilisation and minimisation of waste), economic performance, safety and reliability, proliferation resistance and physical protection.

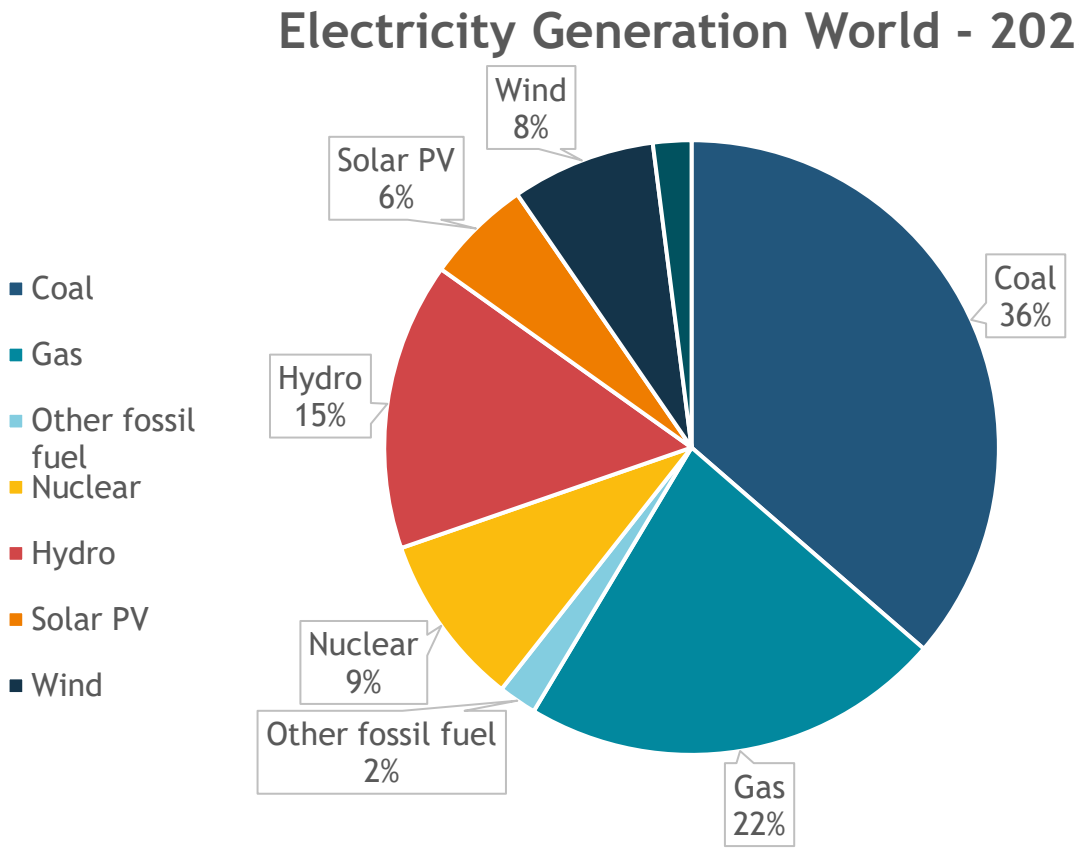
Multinational Design Evaluation Programme (MDEP)
initiative by national safety authorities to leverage their resources and knowledge for new reactor design reviews (ABWR, AES2006, AP1000, EPR, HPR1000).

International Framework for Nuclear Energy Cooperation (IFNEC)
65-country forum for multilateral discussion and analyses of a wide array of nuclear topics involving both developed and emerging economies.

30 Major Joint Projects

- **Nuclear safety research** and experimental data (e.g., thermal-hydraulics, fuel behaviour, severe accidents).
- **Nuclear safety databases** (e.g., fire, common-cause failures).
- **Nuclear science** (e.g., thermodynamics, fuel and material testing, artificial intelligence (AI)).
- **Radioactive waste management** (e.g., thermochemical database).
- **Radiological protection** (e.g., occupational exposure).
- **Nuclear Education, Skills and Technology Framework (NEST)** (promoting the development of a new generation of subject matter experts).

How Does the World Generate its Electricity?



Source: IEA 2024

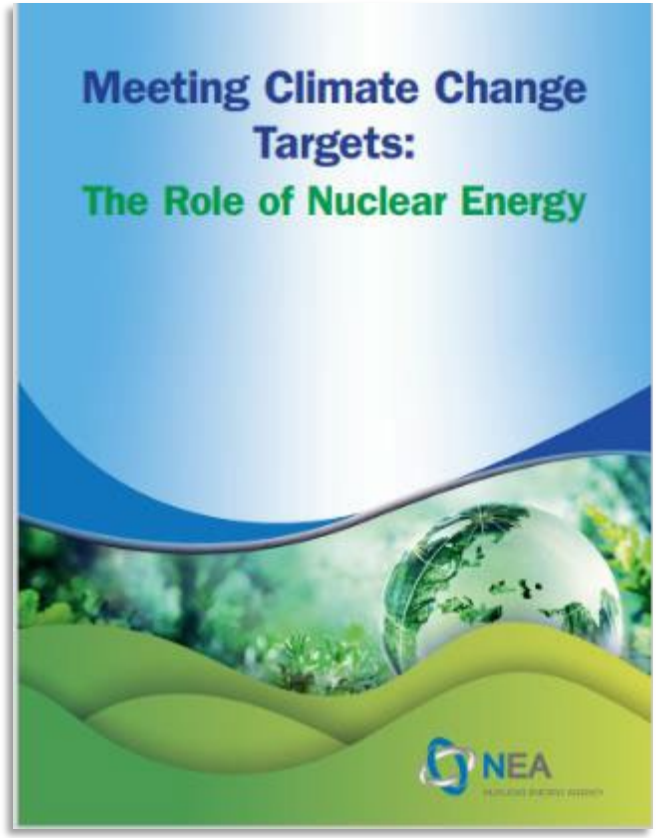
Nuclear power is the second largest low-carbon source of electricity globally.

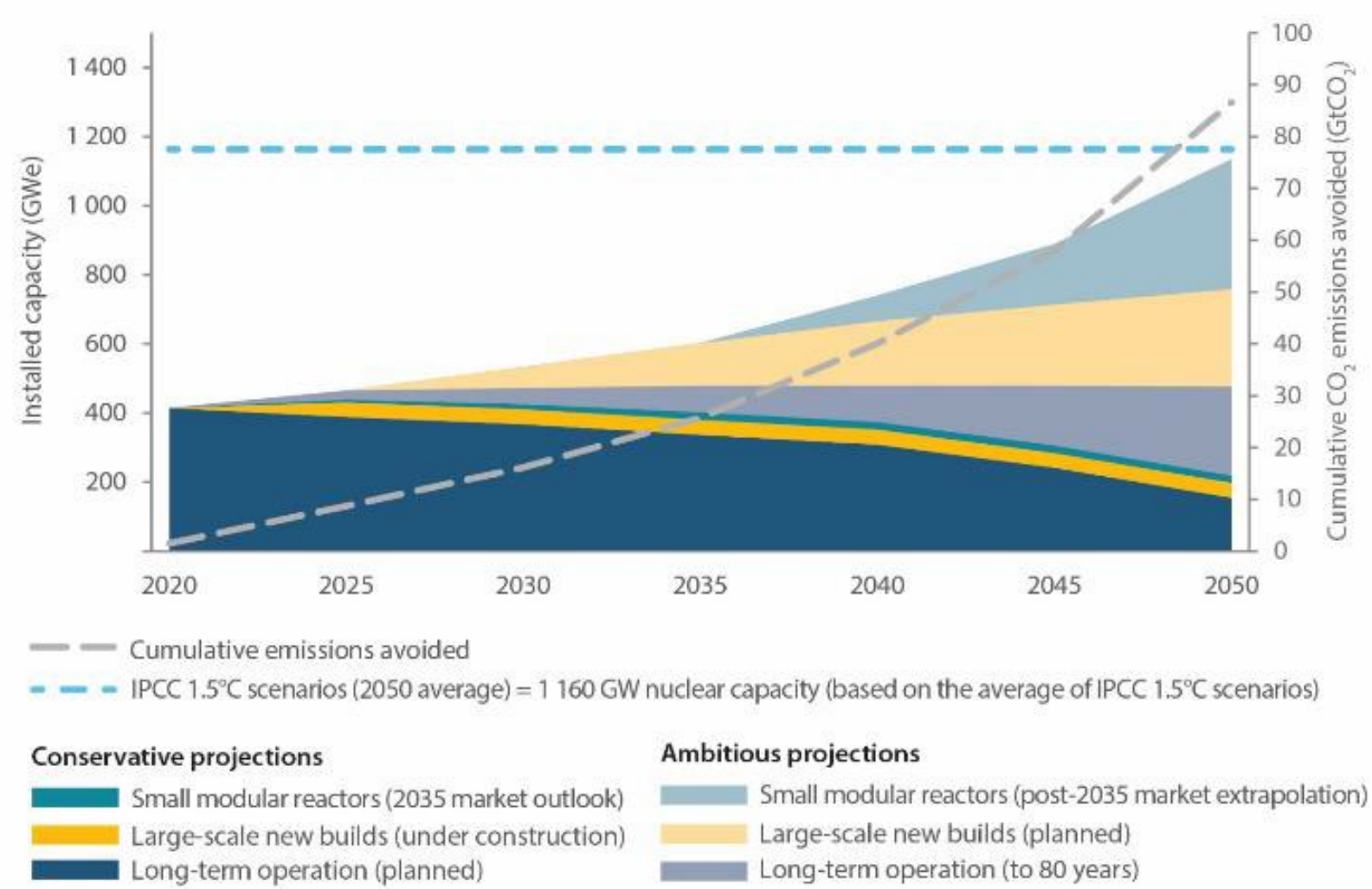
Fossil fuels still provide 60% of electricity around the world.

From 2010 to 2023:

- Global electricity generation increased by nearly 8400 TWh.
- Global output from low-emissions sources (renewables and nuclear) increased by 4800 TWh.
- Global coal-fired generation increased by almost 2000 TWh (+23%) and gas-fired output increased by over 1700 TWh (+36%).
- As a result, electricity sector CO2 emissions increased by 20%.

Climate change: Tripling Nuclear Energy by 2050

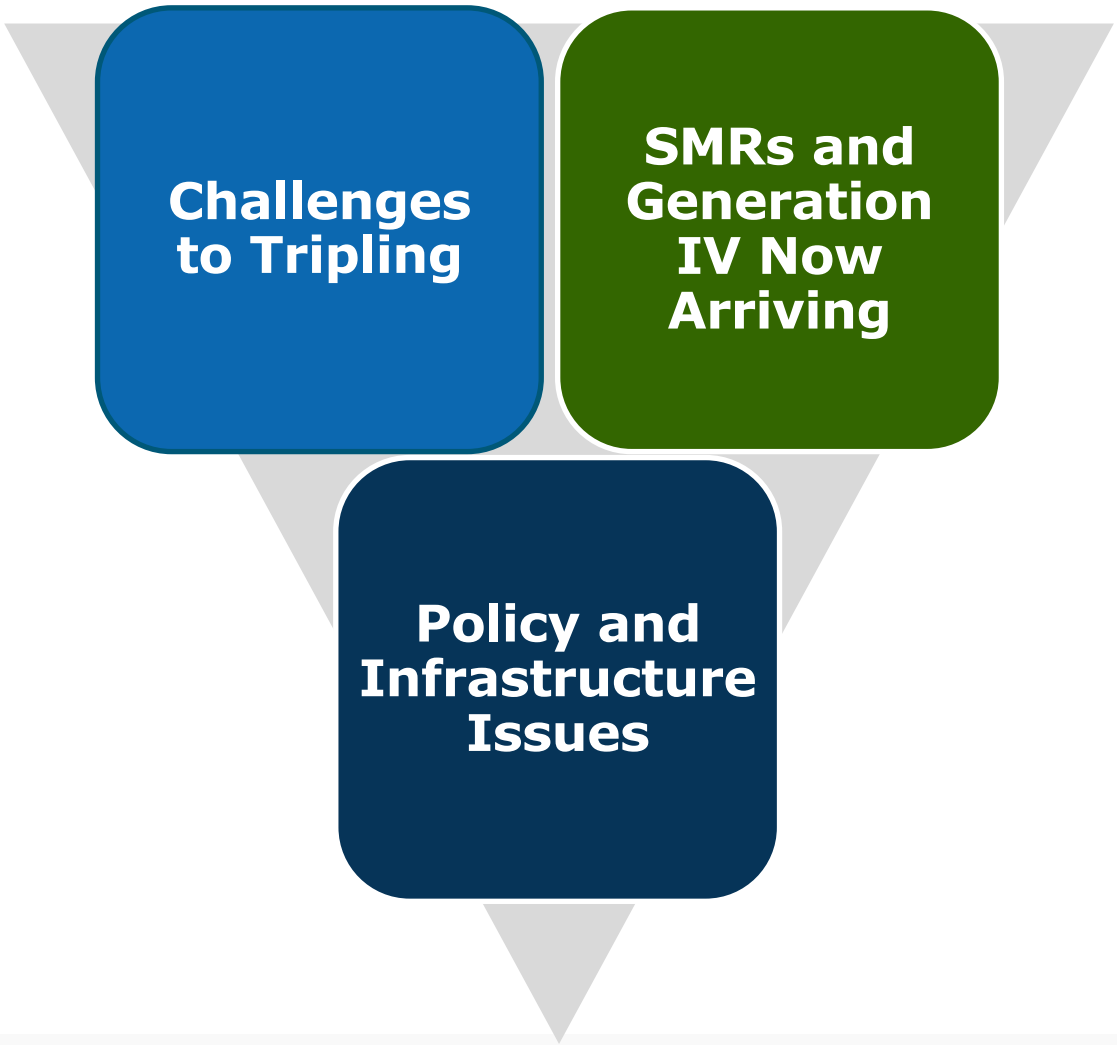




Roadmaps for New Nuclear Ministerial Meetings

- A substantive, problem-solving ministerial that includes industry CEOs, the investment community, multinational financial institutions and many others
- Roadmaps 2023 was co-hosted by France; Roadmaps 2024 was co-hosted by Sweden; Roadmaps 2025 was co-hosted by Korea; and Roadmaps 2025 will be co-hosted by the United States.
- Key issues identified and discussed include: Financing, Global supply chains, and Human capacity

Energy Security and Technological Innovation:
Key Considerations



Challenges to Tripling
Issue to be Addressed

- **Financing**—new policies and approaches are needed to support financing of new nuclear construction, including at International institutions such as the World Bank
- **Managing Project Risk**—Governments will need to play a significant role in managing project risks, especially for FOAK projects
- **Global Supply Chains**—massive investment is needed to assure that the supply chain is ready—including for future LEU/HALEU requirements

SMRs and Generation IV Now Arriving
Key Challenges Lie Ahead

- **Regulators must adapt**—regulators must be risk-informed and efficient and should act nationally but think globally to facilitate SMR access to global markets
- **Technology Development is Necessary but not sufficient**—developers must be able to demonstrate cost and schedule performance and anticipate commercial-scale fleet deployment to meet market needs
- **More clarity regarding waste management**—Generation IV developers must be able to indicate how all wastes will be managed (the NEA WISARD project is addressing this).

Policy and Infrastructure Issues
Key Challenges Lie Ahead

- **Outdated Electricity Markets**—today's markets don't support long-term environmental and energy security goals; dispatchability has value!

- **Nuclear Fuel**—there is enough uranium for the foreseeable future, but LEU supplies may be constrained. Also the lack of a clear path to provide high assay LEU (HALEU) is already a barrier to new technologies

– **Human Resources**—more must be done to promote a new generation of nuclear experts

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NEA Global Forum on Nuclear Education, Science, Technology and Policy

Global Forum on Nuclear Education, Science, Technology and Policy *Overview*

- Engages with **academic institutions** which are responsible for developing the next generation of nuclear science and technology experts.
- Provides academic institutions around the world with a **framework for interaction, co-operation, and collective action**.

Council of Advisors – 40+ members and observers from 20+ academic institutions in 13 countries

Working Groups – 80+ members from 40+ academic institutions in 18 countries

Working Group 1:	Working Group 2:	Working Group 3:	Working Group 4:	Working Group 5:	Working Group 6:	Working Group 7:
Achieving gender balance in nuclear technology & academic workforces	**Defining the future of nuclear engineering education**	**Rethinking the relationship between nuclear energy & society**	**Revitalising Innovation in the nuclear sector**	**Re-establishing nuclear law education programmes**	**Building a pipeline of STEM professionals**	**Developing an international curriculum for the back end of the nuclear fuel cycle**

- Rising Stars Workshops, 3 in 2023, 2024, 2025
- Symposia, 1st in 2025
- National Nuclear Education Workshops, 3 in Japan, Romania and Korea in 2022 and 2023 – upcoming Workshops in Poland and Japan in 2026
- Nuclear Science and Engineering Commencements, 3 in 2020–2022

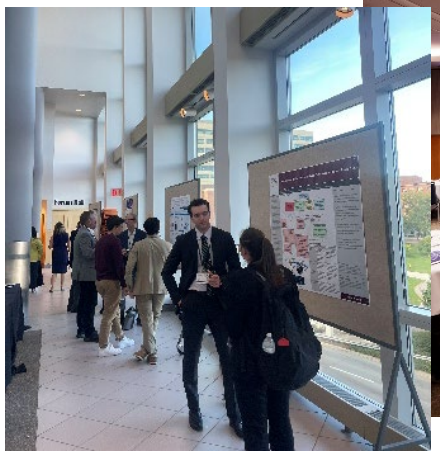
www.oecd-nea.org/globalforum

NEA Global Forum – Inaugural Symposium

- Hosted by the University of Michigan, United States, on 30 September – 2 October 2025.
- Objective: discuss emerging challenges in nuclear engineering education and strategies to support expanding nuclear workforces.
- 180+ participants - key members of academia, government and industry across the globe – participated in:
  - Keynote session, plenary sessions, panel discussions, moments of creativity, and poster sessions.
  - Young professionals programme: 20+ young professionals participated in development and mentorship activities.
  - High-school programme: 40+ high-school students and educators participated in mentoring session and demonstration session.

Professor Seungjin Kim, Chair of the Global Forum, opening the Symposium


Meeting with Dean Karen Thole


Poster session of the Global Forum Symposium


Plenary session of the Global Forum Symposium

NEA Global Forum *Nuclear Futures* Workshop

Shaping dialogue in a changing world

- Collaboration with the NEA High-level Group on Stakeholder Engagement, Trust, Transparency and Social Science (HLG-SET).
- Hosted by the University of New South Wales (UNSW) in Australia on 5-6 August 2025.
- Objective: engage and encourage outstanding young professionals from around the world with leading nuclear experts to discuss the role of nuclear in a changing world.
- 200+ attendees from industry, government, academia, and students.
- Agenda included panels and keynote presentations of inspiring stories highlighting possible careers in the nuclear sector.
- Ongoing work on **Science Diplomacy**: the group is studying the qualitative and quantitative benefits and burdens resulting from the development and use of nuclear technology.

Participants at Nuclear Futures at UNSW, Sydney, Australia in August 2025

NEA Global Forum Rising Stars Workshops

Empowering women, advancing the sector

The Global Forum organises **annual *Rising Stars* workshops** that are building a global community of outstanding young women who will be the future thought leaders in the nuclear community.

These workshops gather approximately 40 of the most accomplished female graduate students and post-doctoral researchers from all over the world to join an annual workshop, comprising of:

- Presentations of their research to their peers and recognized leading experts
- Professional development sessions
- Career panels with international leaders and experts
- Mentoring sessions
- Peer-to-peer networking
- Technical tours and cultural progammes

RisingStars@oecd-nea.org

NEA Global Forum Rising Stars Workshops

Three editions since 2023

- **1st Global Forum Rising Stars Workshops** was held in 2023 at Massachusetts Institute of Technology (MIT), USA
- **2nd Global Forum Rising Stars Workshops** was held 2024 at the European Commission Joint Research Centre (JRC) Karlsruhe, Germany.
- **3rd Global Forum Rising Stars Workshop** was held at the KTH Royal Institute of Technology, Sweden, 10-12 December 2025.
  - ✓ 40 female graduate students and early career professionals from 38 institutions across 17 countries participated.
  - ✓ Programme featured a keynote speech from 2023 Physics Nobel Prize Laureate Professor Anne L'Huillier

Third Rising Stars Workshop, KTH, Stockholm, Sweden, December 2025

NEA Global Forum Nuclear Education National Workshops

Enabling dialogue between academia, government, and industry

The Global Forum organises **National Education workshops** that enable dialogue between academia, government, and the nuclear industry to overcome barriers to nuclear education and to outline scenarios for its future.

The 1st workshop was co-organised with the University of Tokyo and Ministry of Education, Culture, Sports, Science and Technology (MEXT), 19-20 July 2022, Tokyo, Japan.

Objective: Exploring the relevance and attractiveness of nuclear education programmes, their stability and support within universities, as well as potential ways to increase co-operation between nuclear education programmes, the industry, and the government in addressing challenges faced by the nuclear industry.

The 1st National Global Forum workshop in Japan, July 2022

Follow up activity: Planning a **follow up Nuclear Education National Workshop in Japan in 2026**, in collaboration with the Ministry of Education, Culture, Sports, Science and Technology (MEXT).

NEA Global Forum Nuclear Education National Workshops

Moving from insight to implementation

Aligning higher education and workforce needs in Romania

National University of Science and Technology Politehnica Bucharest, Romania, October 2023.

Objective: Identify the principles of a national strategy to enhance nuclear university education.

Follow up activity: establishment of the National School for Nuclear Energy Association; inauguration ceremony in March 2024.

Encouraging greater cohesion of social sciences and STEM to push the nuclear sector forward in Korea

Seoul National University, Republic of Korea, October 2023.

Objective: Help develop curriculum to advance strategies for sustainable nuclear fuel cycle and ways forward in creating a national deep geological repository programme.

Follow up activity: establishment of a new Global Forum Working Group to address the development of curriculum for the fuel cycle.

National workshop in Korea, October 2023

NEA Global Forum for Nuclear Education

Looking ahead: 2026 events and activities

- **Nuclear Education National Workshop in Poland** on 17-18 March 2026 in Warsaw, directly preceding the *Baltic Nuclear Energy Forum.*
- Establishing an Association of Southeast Asian Nations **(ASEAN) regional chapter of the Global Forum,** with a potential launch event in July 2026.

  This ASEAN Chapter of the Global Forum would bring together countries from the Asia-Pacific region (Indonesia, Malaysia, Japan, Korea, the Philippines, Singapore, Thailand, and Vietnam) to create a dedicated platform to address the unique opportunities and challenges facing the Asia-Pacific region in the nuclear sector and share best practices, while also identifying points of interest to build potential collaboration amongst regional players.
- Further developing the **Rising Star workshops**, including a potential Rising Stars conference in 2026 to bring together multiple cohorts.
- Planning a follow up **national workshop in Japan**, in collaboration with Ministry of Education, Culture, Sports, Science and Technology (MEXT).

NEA Nuclear Education, Skills and Technology (NEST) Framework

NEST Framework

Nurturing the next generation of nuclear experts

Launched in February 2019

A multinational framework designed to develop skills and nurture the next generation of nuclear subject matter experts through transfer of practical experience and knowledge

Added-values and benefits

- ✓ Fast track to leadership
- ✓ Multidisciplinary skills and competencies through hands-on training
- ✓ Access to state-of-the-art facilities
- ✓ Opportunity to develop a network through multinational co-operation
- ✓ Participation in challenging and innovative activities

15 participating countries

4 projects ongoing
4 concluded
2 upcoming

50+ participating organisations

235+ Fellowships
(30% women)

NEST Fellows: Master and PhD students, postdocs, and young professionals

Fellowship duration:
1-12 months
Mentors: experts in hosting organisations

www.oecd-nea.org/NEST

NEST Framework

NEST Projects offering hands-on training

Ongoing

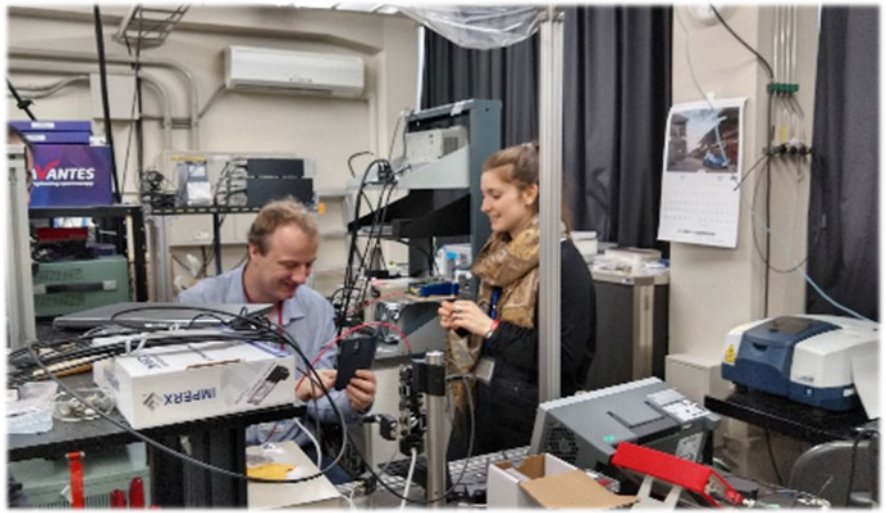
- Small modular reactors (**SMRs**).
- Advanced remote technology and robotics for decommissioning (**ARTERD**).
- Training Radiological and International Nuclear Security (**TRAINS**).
- Improving Cross-disciplinary and Transversal Skills for the Severe Accidents Community (**TCOFF-II**).

Concluded

- Medical applications, nuclear technologies, radioprotection and safety (**MANTRAS**).
- Building competence, expert knowledge, applied techniques, safe decommissioning, train fellows (**BEAST**).
- Hydrogen containment experiments for reactor safety (**HYMERES/PANDA**).
- Radioactive waste management of i-graphite (**I-GRAPHITE**).

Upcoming

- Thermal-Hydraulics Education on Nuclear (**THENS**) (formerly ATLAS-PANDA).
- Radiation Exposure Preparedness for Acute radiation syndrome Infection Response (**REPAIR**).



Hands-on training activities on Robotics and Remote System at Naraha Center for Remote control Technology Development (NARREC) at JAEA, Japan

NEST Fellow with PANDA facility at the Paul Scherrer Institute (PSI), Switzerland

NEST Framework

Key achievements and upcoming events

- **Growing membership**: from 10 countries in 2019 to 15 countries in 2026.
- More than **235 Fellowships completed to date.**
- 2 editions of the **NEST Awards Ceremony** were held to recognise NEST Fellows who have demonstrated excellence throughout their fellowships.

NEST Fellows at the Heavy Metal Summer School, SCK CEN, Belgium, June 2025

Upcoming

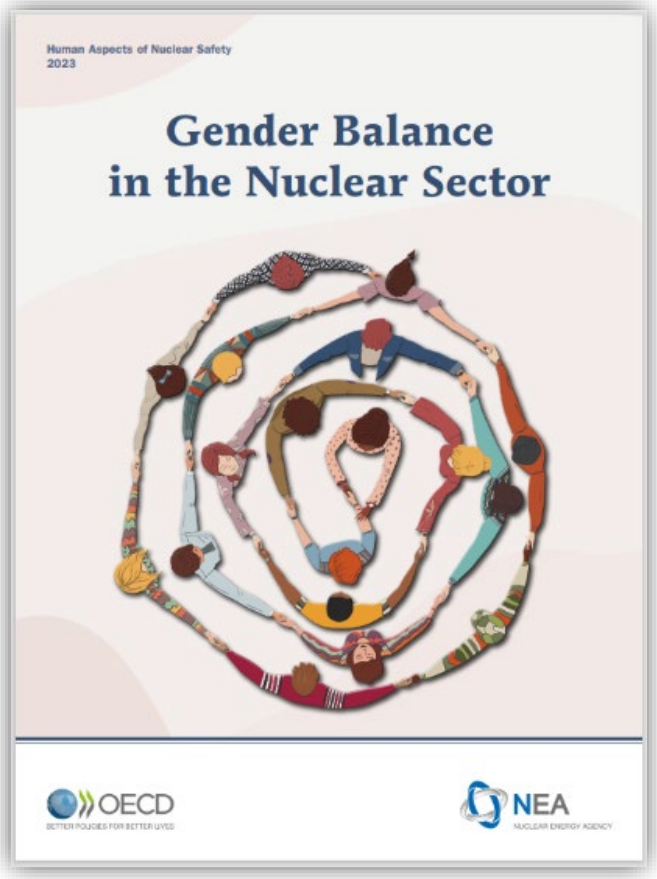
- **NextGen Nuclear Leaders Summer School**
  13-17 July 2026, Karlsruhe, Germany

  First NEST summer school on non-technical skills, co-organised with the NEA High-Level Group on Stakeholder Engagement, Trust, Transparency and Social Sciences (HLG-SET), in collaboration with the European Commission Joint Research Centre (JRC).

NEST Fellows and members of the NEST Jury at the NEST Awards 2025

Empowering Women in Nuclear

NEA Work towards Gender Balance in the Nuclear Sector

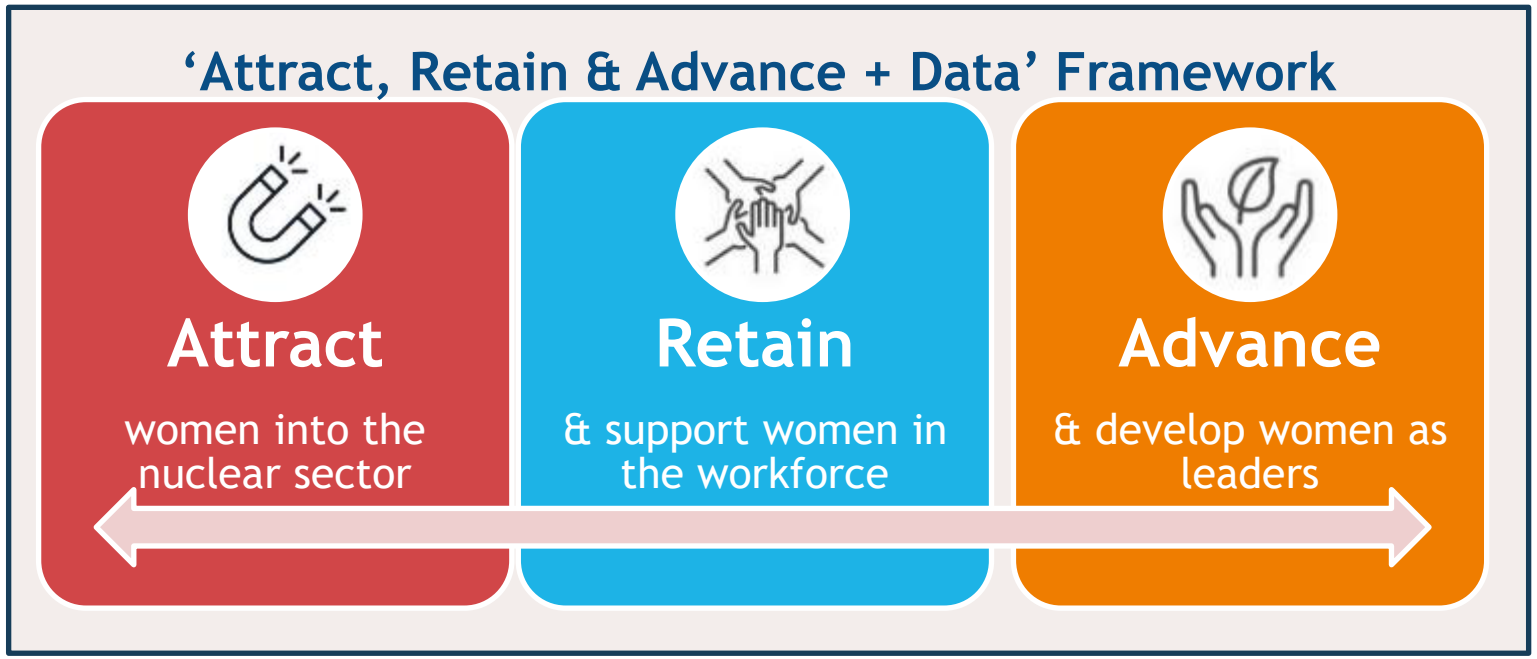


→ **Download the report:**
http://www.oecd-nea.org/gender-balance

Flagship Report Launched on 8 March 2023

- **Takes stock** of current gender balance in nuclear sector in NEA countries
- Provides **first public, international data**
- Objective: To establish policy framework with **recommendations.**

Recommendation on Improving the Gender Balance in the Nuclear Sector adopted by 38 countries on 8 June 2023



NEA International Mentoring Workshops

Since 2017, beginning with the Joshikai Workshop in Japan, **27 mentoring workshops across 11 countries** have empowered **700+ young women and early-career professionals** through connections with leading female STEM experts.

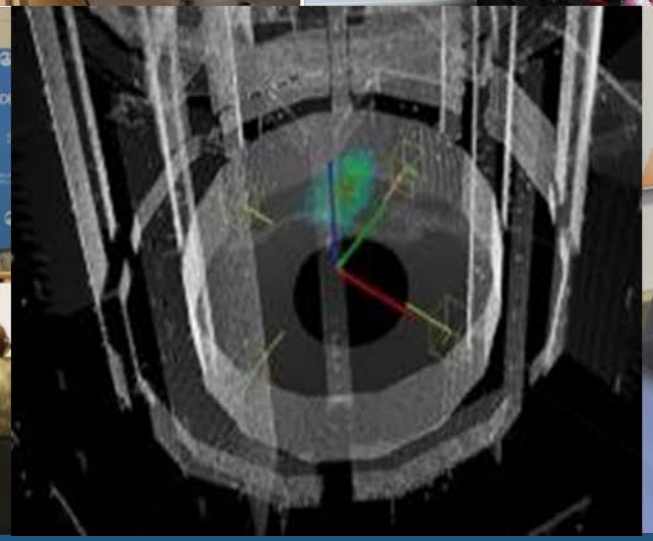
Main objectives:

- ✓ **Increasing enrolment of young women in science and technology studies**
- ✓ **Promoting careers in the nuclear sector**
- ✓ **Enhancing female leadership and visibility**

To date, the NEA organised such workshops in Canada, France, Ghana, **Japan (9 workshops)**, Kenya, Korea, Romania, Spain, the United Kingdom and the United States.

NEA mentoring workshops – YouTube






Developing the Workforce of the Future: NEA training activities

NEA Ongoing Training Activities

Covering a wide range of disciplines

Professional training courses

- International Nuclear Law Essentials (INLE)
- International School of Nuclear Law (ISNL)
- Risk Communication Training Course (RCTC)
- International Radiological Protection School (IRPS)
- International School on Simulation of Nuclear Reactor Systems (SINUS)
- Many other scientific and computer code training courses

NEA International Radiological Protection School (IRPS)

Background: established in 2018 as a collaborative initiative between the NEA, Swedish Radiation Safety Authority and Stockholm University and the Centre for Radiation Protection Research (CRPR) of Stockholm University.

Purpose: to provide in-depth understanding of the spirit of the radiological protection system, its application in diverse scenarios, and its evolving nature based on experiences and lessons learned.

Structure: mix of lectures, interactive case studies, panel discussions and mini-workshops.

Target audience: aimed at early to mid-career professionals.

Frequency & venue: held annually over the period of one week at Stockholm University in Sweden.

NEA International Nuclear Law Essentials (INLE)

Background: started in 2011, builds on the programme of the annual International School of Nuclear Law, which the NEA co-sponsors with the University of Montpellier in France.

Purpose: to provide participants with a practical and comprehensive understanding of the various interrelated legal issues relating to the safe and peaceful use of nuclear energy.

Structure: combination of lectures, panel discussions and case studies.

Target audience: lawyers working in either the public or the private sector but also scientists, engineers, policy makers, managers and other professionals working in the nuclear field. Interest has skyrocketed in the last few years, with now well over 100 applicants annually.

Frequency & venue: held at the OECD in Paris, France, between January and March every year.

NEA International School on Simulation of Nuclear Reactor Systems (SINUS)

Background: launched in 2023 as a multi-lateral cooperation aimed at qualifying the Future Workforce for Modern Modelling and Simulation Tools.

Purpose: addresses validation, verification, and uncertainty qualification (VV&UQ) methodologies with multi-scale, multi-physics modelling & simulation (M&S) tools.

Structure: mix of online lectures, practical exercises, a remote group project, and in-person hands-on training.

Target audience: Masters students, PhD students and young professionals. Interest has skyrocketed lately, with over 300 applications from 51 countries in 2025.

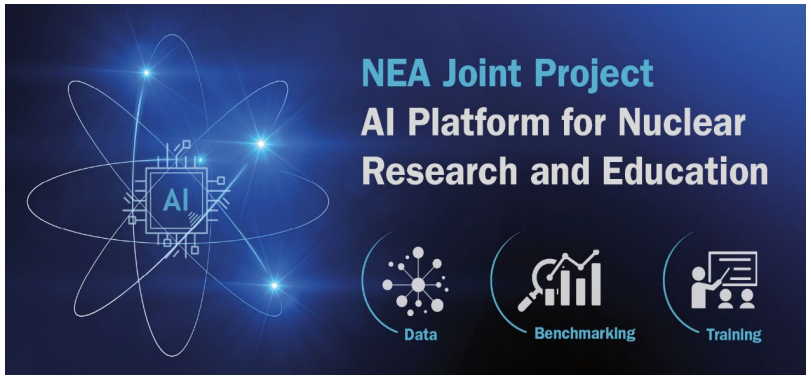
Frequency & venue: held annually between March and June, alternating host countries.

NEA New Joint Project: AI Platform for Nuclear Research and Education (AIxpertise)

Three pillars of the project:

- **Data**
- **AI Algorithm Benchmarking**
- **Training and Best Practices**

Planned launch: Q1 2026



aixpertise@oecd-nea.org

Training and Best Practices Pillar will offer

- ✓ **Resources for training and education,** including hands-on exercises based on data repositories to assess and train AI models.
- ✓ **Workshops for sharing best practices** to accelerate AI adoption in nuclear applications.
- ✓ **AI schools** tailored for nuclear engineers, scientists, and students to foster skill development.
- ✓ **Certified education programme** in partnership with the NEA Global Forum.

For Climate Action to be Successful, An Enhanced Vision of the Future is Needed

If action on climate is associated with limits to life, economic growth, and freedom, a successful energy transition will be difficult.

Innovative Nuclear Technologies Help Provide a Solution Set

A Capable Workforce Drives the Success of Innovation

Thank you for your attention!