

WORLD NUCLEAR
ASSOCIATION

20
YEARS

At Work

2022 edition



Foreword

With the world in a continued state of flux throughout 2021, the reliability of nuclear energy as a stable pillar for communities around the world has never been clearer – be it in ensuring the fight against the pandemic, or addressing the ongoing energy crisis. The Association has continued to make the case for nuclear energy globally, ensuring that the industry is properly represented at the heart of key debates.

When the world came together in Glasgow last November to increase the level of ambition on climate action, the Association redoubled its efforts to ensure that nuclear energy can continue to be a key tool in achieving deep decarbonization. In the run-up to the conference, the United Nations Economic Commission for Europe released a report – in which the Association had made significant contributions – on the importance of nuclear energy in combatting climate change. This report will be a useful resource for years to come, and has already influenced policy-makers.

Throughout 2021, we saw many examples of the nuclear community coming together to make a passionate case for nuclear. At COP26 we stood up for the many strengths that nuclear energy possesses, and spread an unashamedly positive vision of nuclear. With key partners, the Association continued to be heavily involved in the European Union's Sustainable Financing Taxonomy, stressing the case that nuclear energy has a hugely important role to play in transitioning to a clean energy system. The recent announcement that nuclear will be included in the EU Taxonomy is not only a welcome step, but also showcases that decisions must be based on the best available science – even if challenges remain in fully realizing this goal.

The Association has continued to provide thought leadership for the industry, having published many key reports on a range of issues crucial to the industry and beyond, be it on the need to recalibrate the conversation about risk, how nuclear technologies can help meet the UN's Sustainable Development Goals, the state of the nuclear fuel market, or the harmonization of standards and regulations. Through these publications, alongside the Association's representation of the global industry at key energy events, we not only work to future-proof the industry, but also continue to make the unequivocal case for nuclear energy around the world. Additionally, the Association has hosted a number of successful events, on topics such as finance, innovation, and climate, with the World Nuclear University continuing to develop the next generation of nuclear leaders through its many virtual training programmes.

It is perhaps clearer than ever that nuclear energy has a key role to play globally. World Nuclear Association is proud to be the only organization that brings together the global nuclear industry, facilitating dialogue and collaboration among companies from all over the world. With nuclear, we can break the link between improved living standards and higher emissions, as well as unlocking a high-powered lifestyle for all people, irrespective of where you call home. As the global community comes together to ensure that the transition to a clean energy system is done in a just manner, and facing totally new tensions in 2022, the Association will continue to work to ensure that nuclear energy continues to play a central role.



Sama Bilbao y León
Director General



Philippe Knoche
Chairman

Highlights

In its 20th anniversary year, World Nuclear Association continued to highlight the benefits of nuclear power in the global energy debate and proudly represent the global nuclear industry at key events. Here are some of the accomplishments for 2021.

January

Working Group meetings gather global nuclear experts

247 participants attend Working Group meetings virtually to discuss activities and publications for the year ahead.

Atlantic Council Global Energy Forum

The Association presents the essential role of nuclear energy in the post-pandemic energy systems for the developing world.

March

Strategic eForum on Sustainable Finance

The Association holds the first of its 2021 Strategic eForum events, discussing the financial conditions needed for cost-effective investment in nuclear energy, attracting over 400 live participants.

New partnership with the ASEAN Centre for Energy

World Nuclear Association and the Association of Southeast Asian Nations (ASEAN) Centre for Energy sign a memorandum of understanding (MoU) under which they agree to work together towards building capabilities on nuclear energy technologies and applications.

Contribution to the UNECE Entry Pathways report

The Association makes key contributions to the United Nations Economic Commission for Europe (UNECE) *Use of Nuclear Fuel Resources for Sustainable Development - Entry Pathways* report.

Fukushima Daiichi 10-year anniversary website portal

The Association launches a dedicated portal on its website compiling several information resources, including the Director General's reflections on the accident and its consequences, relevant articles, and a Q&A section.

Our response to the Joint Research Centre taxonomy report

The Association calls on the European Commission not to delay defining the process and the timeline for the inclusion of nuclear energy in the EU Sustainable Finance Taxonomy, following the conclusion of the JRC's report that there was no scientific case for excluding nuclear energy from the taxonomy.

April

World Nuclear Fuel Cycle 2021 conference

World Nuclear Association and the Nuclear Energy Institute (NEI) hold the World Nuclear Fuel Cycle 2021 conference virtually with over 260 participants. In parallel, 200 members and observers join the Association's Working Group meetings.

Statement ahead of the Leaders Summit on Climate

In collaboration with several nuclear associations, the Association releases a statement ahead of the *Leaders Summit on Climate* urging world leaders to put in place technology-neutral policies that will make it possible for countries to deploy all the low-carbon options available as they set their action plans to reach net-zero.

May

World Nuclear Association celebrates 20 years of success

The Association celebrates its 20th anniversary and reflects upon some of its key achievements in the last two decades.

New white paper on recalibrating risk

The Association releases a new white paper, *Recalibrating risk: Putting nuclear risk in context and perspective*, that calls upon policy-makers and regulators to adopt a science-based, all-hazards approach to the assessment and management of risk when evaluating different energy sources on an equitable basis.

June

Strategic eForum on Nuclear Innovation

The second Strategic eForum of 2021 discusses key issues surrounding nuclear innovation, drawing parallels with innovation in other sectors, such as pharmaceutical and renewable energy industries.

Contributing to the UN High-level Dialogue on Energy

The Association hosts a side event as part of the UN High-level Dialogue on Energy Ministerial Thematic Forums. For the first time in more than 40 years the UN General Assembly discusses energy.

Representing the industry at CEM12

World Nuclear Association contributes to a high-level panel during the 12th Clean Energy Ministerial (CEM12) event on *Net Zero Emissions Pathways with Nuclear Innovation* discussing the ways in which nuclear energy can contribute to reducing carbon emissions in the fight against climate change.

July

WNU Strategic Leadership Academy

World Nuclear University's (WNU's) Strategic Leadership Academy, is held for the first time. The course reached full capacity with a total of 32 fellows from 18 countries.

The World Nuclear Industry Today course

WNU and Tsinghua University jointly host a week-long course for over 250 students from 25 universities.

August

Partnership with Women in Nuclear Global

World Nuclear Association and Women in Nuclear Global (WiN Global) sign a new partnership agreement under which they recognize their shared goal of supporting the advancement of nuclear science and technology, and the global nuclear industry.

UNECE technology brief on nuclear power

The Association contributes to the publication of the UNECE technology brief on nuclear power.

September

A successful week for Working Groups and 2021 Symposium

The Association holds its premier annual event for the global nuclear industry, World Nuclear Association Symposium, bringing together delegates from 39 countries virtually. Over 400 registrants, representing over 100 member organizations and invited observers, join Working Group meetings.

65th IAEA General Conference: two agreements signed

The Association signs two partnership agreements with the International Atomic Energy Agency (IAEA) during the 65th IAEA General Conference, including joining the IAEA Nuclear Saves Partnerships.

20th edition of The Nuclear Fuel Report

The Association releases the 20th edition of its flagship biennial report, *The Nuclear Fuel Report: Global Scenarios for Demand and Supply Availability 2021-2040*, analysing the impact of positive trends in nuclear generation projections in uranium markets and fuel fabrication infrastructure.

World Nuclear Performance Report

The Association publishes its annual *World Nuclear Performance Report*, providing detailed information on power generation and construction achievements for the year 2020.

October

Strategic eForum: Committing to Net Zero

Ahead of COP26, the final World Nuclear Association Strategic eForum of 2021 takes place with over 400 participants.

WNU School on Radiation Technologies

33 fellows from 18 countries, with just under 50% of them being women, participate virtually in WNU's School on Radiation Technologies.

November

Representing the industry at COP26

The Association represents the global nuclear energy industry at COP26 in Glasgow, UK, participating in several side events.

December

Keynote speech at World Nuclear Exhibition

The Association addresses the delegates at the World Nuclear Exhibition in Paris, France, emphasizing that nuclear energy offers an opportunity to build a cleaner and more equitable world.

Two memoranda of understanding

The Association signs MoUs with the European Nuclear Society (ENS) and the Korea Nuclear Association for International Cooperation.

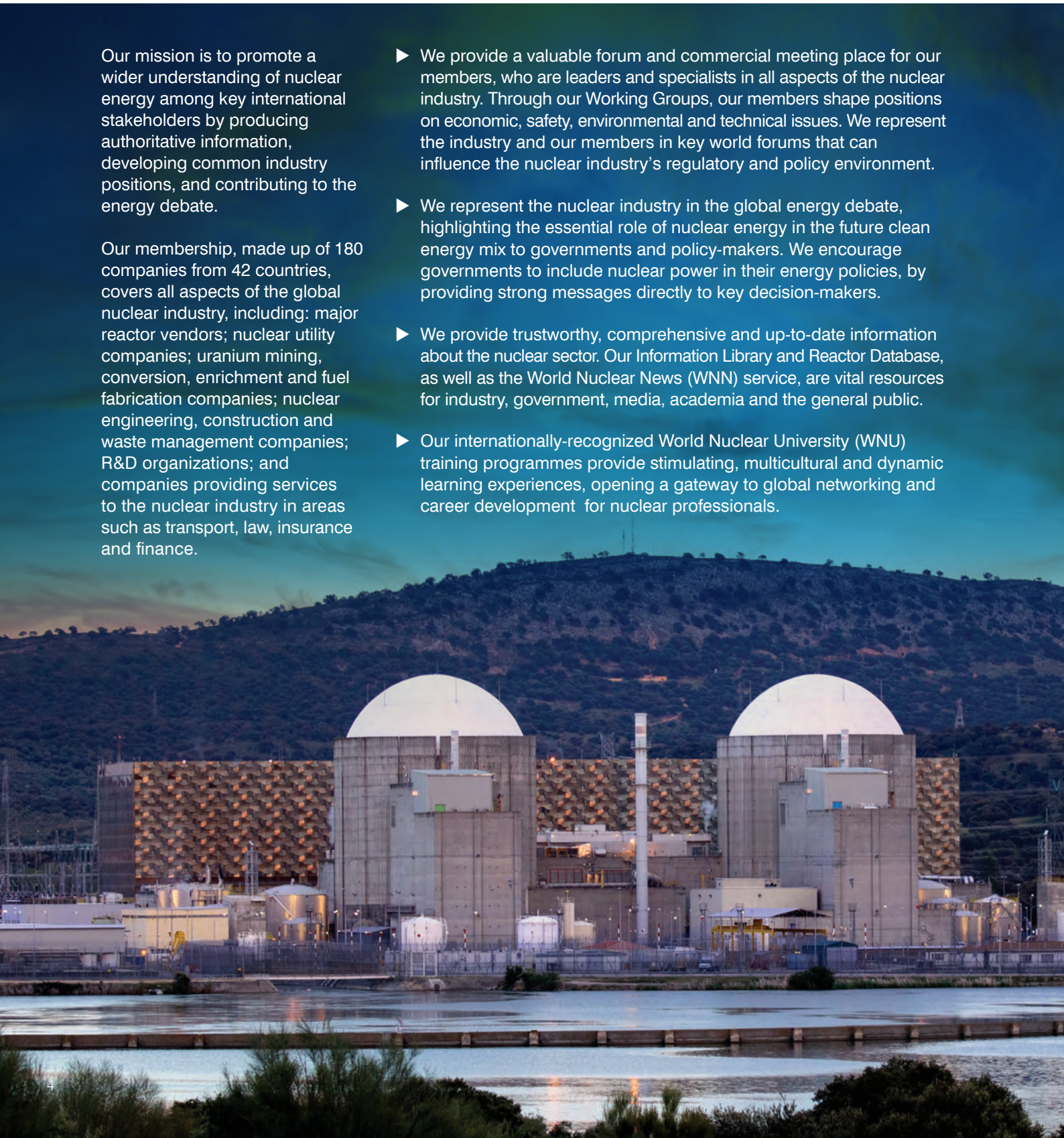
World Nuclear Association today

World Nuclear Association is the only industry organization with a global mandate to promote nuclear energy and represent the companies that constitute the worldwide nuclear industry.

Our mission is to promote a wider understanding of nuclear energy among key international stakeholders by producing authoritative information, developing common industry positions, and contributing to the energy debate.

Our membership, made up of 180 companies from 42 countries, covers all aspects of the global nuclear industry, including: major reactor vendors; nuclear utility companies; uranium mining, conversion, enrichment and fuel fabrication companies; nuclear engineering, construction and waste management companies; R&D organizations; and companies providing services to the nuclear industry in areas such as transport, law, insurance and finance.

- ▶ We provide a valuable forum and commercial meeting place for our members, who are leaders and specialists in all aspects of the nuclear industry. Through our Working Groups, our members shape positions on economic, safety, environmental and technical issues. We represent the industry and our members in key world forums that can influence the nuclear industry's regulatory and policy environment.
- ▶ We represent the nuclear industry in the global energy debate, highlighting the essential role of nuclear energy in the future clean energy mix to governments and policy-makers. We encourage governments to include nuclear power in their energy policies, by providing strong messages directly to key decision-makers.
- ▶ We provide trustworthy, comprehensive and up-to-date information about the nuclear sector. Our Information Library and Reactor Database, as well as the World Nuclear News (WNN) service, are vital resources for industry, government, media, academia and the general public.
- ▶ Our internationally-recognized World Nuclear University (WNU) training programmes provide stimulating, multicultural and dynamic learning experiences, opening a gateway to global networking and career development for nuclear professionals.



Driving action towards achieving the Harmony goal



HARMONY

The aim of World Nuclear Association and its members is to contribute to building a cleaner, more equitable world, in which everyone has access to low-carbon, affordable, abundant energy and a high quality of life.

The *Harmony* goal quantifies this vision, by which at least 25% of global electricity is provided by nuclear energy before 2050 to help meet the demand for sustainable energy.

The *Harmony* programme is an initiative of the global nuclear industry. It provides a framework for cooperative action and engages with key intergovernmental climate and energy organizations so that the policy barriers to achieving this goal can be removed.

The Association has made significant progress in 2021 to incorporate *Harmony* programme issues and objectives in the international energy dialogue and associated policies.

One of these is the *Nuclear Power Brief* produced by the UNECE with the Association's support, which includes *Harmony* programme recommendations as the key messages for policy-makers:

- Establish a level playing field for all low-carbon technologies.
- Provide positive, long-term policy signals for new nuclear development.
- Accelerate the development and deployment of SMRs and advanced reactor technologies.
- Secure the long-term operation of existing nuclear plants.
- Assess the merits of low-cost financing of nuclear power projects.



Another UNECE report, *Nuclear Fuel Resources for Sustainable Development - Entry Pathways*, includes a section on the *Harmony* programme, highlighting the *Harmony* goal as essential for reaching the UN Sustainable Development Goals (SDGs). These reports have been referenced by a number of governments including France, Hungary and the UK to support new nuclear development.

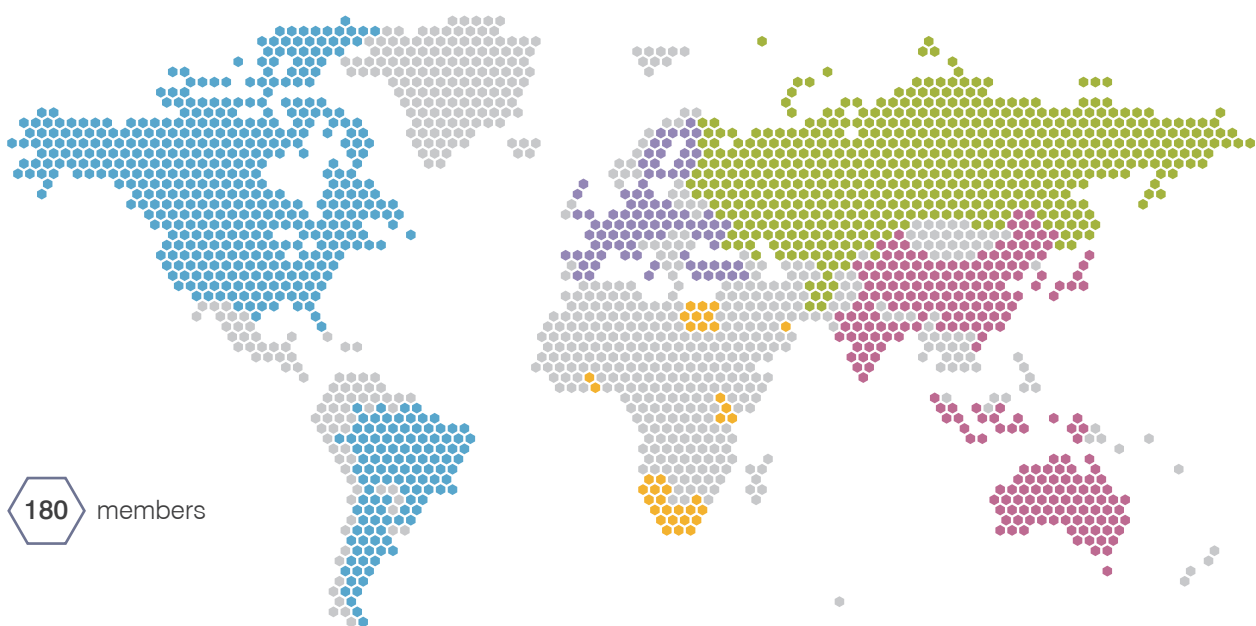
Significant progress was also made on energy modelling to further develop the *Harmony* goal and quantify the potential of nuclear power's contribution to the entire energy system, including district heating, process heating, hydrogen generation, in addition to electricity production.

Our global network of member companies

By becoming a member of World Nuclear Association, you become part of the international network that is shaping the future of nuclear energy. We provide unique opportunities to help your company and the global nuclear industry make a difference.

Main benefits

- 1 Network with industry leaders and technical experts from around the world and from across the nuclear value chain.
- 2 Raise your company's international profile in the globalized nuclear market.
- 3 Support the promotion of nuclear energy and the industry's vision in the international arena.
- 4 Influence decisions on topics of strategic importance to nuclear development.
- 5 Develop and share common industry positions and best practices on strategic issues.



Africa and Middle East ● 10 members
Egypt, Ghana, Jordan, Kenya, Namibia, South Africa, United Arab Emirates

Americas ● 52 members
Argentina, Bolivia, Brazil, Canada, USA

Asia-Pacific ● 51 members
Australia, Bangladesh, Mainland China and Taiwan, India, Indonesia, Japan, Singapore, South Korea

Europe ● 54 members
Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Luxembourg, Netherlands, Poland, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, UK

Russia and Central Asia ● 13 members
Kazakhstan, Russia, Uzbekistan

World Nuclear Association celebrates 20 years of success

**WORLD NUCLEAR
ASSOCIATION**

**20
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In 2021, World Nuclear Association celebrated its 20th anniversary. Over the past 20 years the Association has delivered on its broadened mission, and become the undisputed voice of the nuclear industry on the global stage. The Association's many achievements, including the foundation of World Nuclear News, World Nuclear University, and the creation of the *Harmony* Programme, as well as the publication of many essential flagship industry reports, are a testament to the combined work of our members and the Association's Secretariat.

In the years to come, we will continue to work tirelessly with partners and stakeholders to support the cost-effective and timely delivery of nuclear projects, and to ensure that the role of nuclear technology in satisfying global energy demand, achieving climate targets and helping the world to meet sustainable development goals is properly valued and recognized.

To mark the anniversary, the Association prepared a video highlighting our key achievements over the past two decades, which was presented at the World Nuclear Association Symposium 2021. The video is available to watch on our YouTube channel.

If you are interested in joining, please contact:
membership@world-nuclear.org



Strategic partnerships

In 2021, the Association strengthened existing relationships with international organizations and built new partnerships. We continued our efforts to firmly place nuclear energy on the international clean energy agenda by engaging in policy activities, coordinating the involvement of the nuclear industry in key international initiatives and working with newcomer countries.

Inclusion of nuclear energy in sustainable finance

There has been a growing focus on environmental, social and governance (ESG) issues, with many countries taking policy and regulatory steps to enhance the role of the financial system in the transition towards low-carbon and sustainable economies. The inclusion of nuclear energy in ESG taxonomies would mean that nuclear projects may be eligible for sustainable financing.

The Association has worked closely with Foratom to ensure the inclusion of nuclear in the EU Taxonomy for sustainable activities. Our two joint webinars raised awareness among the global nuclear industry of this crucial issue with potential impacts well outside the EU. The Association also continued to monitor global initiatives in sustainable and ESG financing, engaging with various organizations to lobby for the inclusion of nuclear energy. For example, we sent a letter to the UK's Chancellor of the Exchequer questioning the exclusion of nuclear energy from the UK's Green Financing Framework. As part of our Strategic eForum series, we explored a few of these global initiatives in our March event on sustainable finance.

United Nations Economic Commission for Europe (UNECE)

The Association continued its efforts to ensure nuclear energy remains a key part of the United Nations sustainable development agenda. We worked on several nuclear and energy-related publications together with the UNECE, which highlight key *Harmony* programme topics:

- *Use of Nuclear Fuel Resources for Sustainable Development – Entry Pathways* report, which includes a dedicated section on the *Harmony* programme.
- *Technology Brief: Nuclear Power* on the role of nuclear energy to attain carbon neutrality.
- *Life Cycle Assessment of Electricity Generation Options* report.

The last two publications have been referenced by governments in France, Hungary and the UK to support new nuclear development. The Association is continuing its work with the UNECE, specifically on its Carbon Neutrality Project, with more reports expected in 2022.

In addition, we contributed to several events hosted by the UNECE that featured nuclear energy. We spoke at a COP26 side event on *Delivering a just transition to a clean energy future and supporting the UN Sustainable Development Goals*, which presented the UNECE Carbon Neutrality Project. We also participated in an event on *Financing the decarbonization of energy systems in the ECE region during the 11th International Forum on Energy for Sustainable Development*, which launched a project to develop a UNECE guideline for financing clean energy projects.



For those countries who choose to implement this technology, nuclear power is an important source of low-carbon electricity and heat that can contribute to attaining carbon neutrality and hence help to mitigate climate change and attain the 2030 Agenda for Sustainable Development.



Olga Algayerova
UNECE Executive Secretary

Association of South-East Asian Nations (ASEAN)

We signed a memorandum of understanding (MoU) with the ASEAN Centre for Energy (ACE) to work together towards building nuclear energy technology capabilities in ASEAN member countries, particularly in stakeholder communications, financing and advanced technology. The Association collaborated closely with ACE in the launch of the ASEAN Nuclear Portal, and organized and moderated a panel on *Advancement of SMR Technology and its Opportunity in the ASEAN Region* during the ASEAN Energy Business Forum 2021.



I am glad to see the bright future for our collaboration. I really look forward to tangible activities on the civilian nuclear programme in the region.



Nuki Agya Utama
Executive Director of the
ASEAN Centre of Energy

The International Monetary Fund (IMF)

The Association contributed to, and provided industry data for, the March 2021 IMF report on *Building Back Better: How Big Are Green Spending Multipliers?* The report concluded that nuclear energy has a higher economic multiplier effect than renewables and fossil fuels in the context of using the post-pandemic economic recovery to accelerate the energy transition.

Joining forces with other nuclear organizations

The Association hosted high-level strategic collaboration meetings with the heads of the IAEA, Nuclear Energy Agency (OECD-NEA), Foratom, Nuclear Energy Institute, Canadian Nuclear Association and Japan Atomic Industrial Forum (JAIF). In preparation for the climate change talks at

COP26, we developed a year-long action plan with national and regional nuclear associations.

In 2021, the Association signed several collaboration agreements with international organizations.

During the 65th IAEA General Conference, the Association signed two partnership agreements with the IAEA. We extended our existing partnership to enhance our strong relationship in the areas of nuclear energy, nuclear facilities and fuel cycle, and joined the IAEA's Nuclear Saves Partnerships, which supports the transfer of nuclear science and technology to improve the health and prosperity of millions of people around the world.



World Nuclear Association has joined the IAEA's Nuclear Saves Partnerships for companies and organizations to support the transfer of peaceful nuclear technologies to countries, improving the health and prosperity of millions. Thank you, and I look forward to working together.



Rafael Grossi
Director General, IAEA

The Association also signed MoUs with Women in Nuclear Global (WiN Global), the European Nuclear Society (ENS), and the Korea Nuclear Association for International Cooperation (KNA).

Bringing nuclear to the forefront of the global energy debate

In 2021, the Association represented the global nuclear industry at external events, in international media and at the 26th UN Climate Change Conference of the Parties (COP26) in Glasgow.

Advocating the industry at external events

The Association organized a side event at the UN Ministerial Thematic Forums for the High-level Dialogue on Energy on Nuclear energy's contribution to net-zero and the sustainable development goals, organized together with the Canadian Nuclear Association, FORATOM, Japan Atomic Industry Forum, and Nuclear Energy Institute. Kathryn Huff, US Department of Energy, and Tomasz Nowacki, Polish Ministry of Climate and Environment spoke about their countries' support for nuclear energy.



In June, we participated in the Atlantic Council Global Energy Forum discussing the post-pandemic energy system, emerging net-zero carbon goals, the role of the Middle East in the energy transition, and the USA's energy and foreign policy priorities in the Biden administration.



We spoke at the 12th Clean Energy Ministerial (CEM12), hosted by Chile, on a high-level panel on *Net Zero Emissions with Nuclear Innovation*, explaining the ways in which nuclear energy can contribute to reducing carbon emissions in the fight against climate change.



Reaching international media

In 2021, the Association featured extensively in global media and released several press releases responding to industry news and the release of key reports.

For example, we called upon the European Commission to include nuclear energy in the European Union Sustainable Finance Taxonomy following the release of the Joint Research Centre's (JRC) scientific assessment. We also urged policy-makers to take immediate steps to prevent the premature closure of existing nuclear generation capacity and to increase the scale and accelerate the timeframe for investment in new nuclear capacity, following the *Leaders Summit on Climate Change* in April 2021.

Responding to the publication of the International Energy Agency's (IEA's) *Net Zero by 2050* report, Sama Bilbao y León, commented: "*The IEA makes it clear that nuclear energy will be an essential component of a global net-zero emissions energy transition. Governments must now take action to ensure that nuclear energy can play a major role in the clean energy transition to which so many of them have now committed.*"

Representing the nuclear industry at COP26

World Nuclear Association was proud to represent the global nuclear energy industry at COP26 in Glasgow, UK. Nuclear energy's contribution to achieving the goals of the United Nations Framework Convention on Climate Change (UNFCCC) was positively acknowledged at the Glasgow conference, in contrast to some previous COPs.

Preparing for COP26

In the run-up to COP26, the Association:

- Launched a website portal with information on COP 26 and nuclear energy's contribution to achieving a sustainable net-zero emissions future.
- Held a virtual event on *Committing to Net-Zero* discussing why nuclear companies are pledging to achieve net-zero for their own operations and how nuclear technologies can help achieve net-zero, gathering over 400 participants.
- Released a joint statement with other nuclear associations ahead of the *Leaders Summit on Climate*, urging world leaders to put in place technology-neutral policies.
- Wrote a letter to Alok Sharma, President of COP26, urging the organizers of the conference to treat nuclear energy fairly and to ensure that it is well represented alongside other low-carbon energy sources. The letter was featured in *The Telegraph* newspaper.
- Published a new report explaining nuclear energy's contribution to achieving the 17 United Nations SDGs, and released a special COP26 edition of the *World Nuclear Performance Report 2021*.

Attending COP26

During the COP26 conference, the Association represented the nuclear industry at several side events and extensively covered updates from the conference on WNN and social media. Together with the Canadian Nuclear Association, International Youth Nuclear Congress and Nuclear Energy Institute, we hosted an official UN side event, *Delivering a just transition to a clean energy future and supporting the UN Sustainable Development Goals*.

Sama was invited to speak at several events, including the UK government's Department for Business, Energy & Industrial Strategy (BEIS) event on *The Role of Nuclear Energy in a Net Zero Future*, the IAEA's event on *Nuclear Innovation for a Net Zero World*, and Rosatom's event on *The Role of Nuclear Energy in Meeting Net-Zero Obligations*.



Nuclear energy will guarantee reliable, clean energy at competitive pricing. Ghana is taking concrete steps to incorporate nuclear power into its energy mix as this is in line with its national development targets.



Ghana's Ambassador to Austria, Philbert Johnson, speaking at the BEIS event at COP26



Serving as a key provider of nuclear news and information

We provide the latest and most authoritative information about nuclear energy to the industry, government, media and academia. Our information channels include the World Nuclear Association website with its Information Library and Reactor Database, World Nuclear News (WNN), and several social media accounts that enable us to deliver accurate information in a timely manner.

Providing authoritative and accessible information and data

The Information Library section of the website features over 180 detailed pages covering all aspects of the nuclear industry. The Library is a valuable resource for policy-makers, politicians, scholars and the general public. In 2021, two new information pages were published, including *Nuclear Energy and Sustainable Finance* and *Mineral Requirements for Electricity Generation*. The Information Library was viewed 5.4 million times in 2021, up from 4.9 million in 2020.

The Reactor Database presents country pages and a global dashboard showing the most recent construction starts and grid connections, and highlights the top performing reactors worldwide. Through the IAEA's Power Reactor Information System (PRIS) and our own research, the database shows the global contribution of nuclear energy.

Nuclear Essentials is a section on our website that discusses the strengths of nuclear technologies and addresses common myths surrounding the nuclear industry. The educational tool addresses questions such as the potential of nuclear technologies, the disposal of nuclear waste, and the role of nuclear energy in combating climate change. In 2021, we published two new papers: *Are there different types of nuclear reactor?* and *What are the effects of nuclear accidents?*

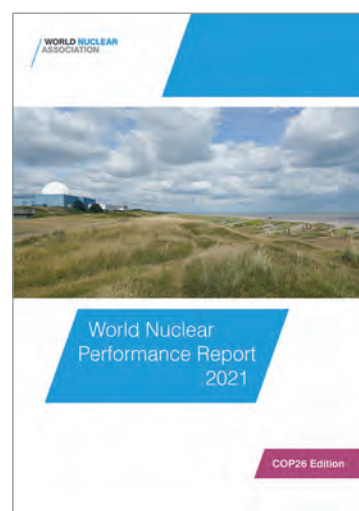
Talking Points is a collection of high-level messages on nuclear energy backed up by supporting facts. It is an essential communication tool for use by the nuclear industry to support its media and public communication activities as well as for internal communication.

Putting key issues into context

We continued our series of white papers with *Recalibrating risk: putting nuclear risk in context and perspective*, which calls upon policy-makers and regulators to adopt a science-based, all-hazards risk assessment and management system to evaluate different energy sources on an equitable basis.

Highlighting the performance of the nuclear industry

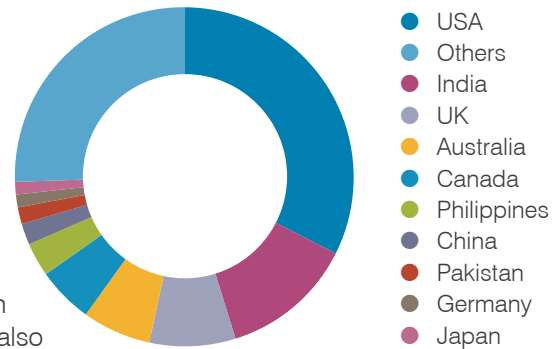
The *World Nuclear Performance Report 2021* provides an up-to-date picture of the construction and operational performance of the civil nuclear power sector across key metrics. This year we released a special COP26 edition ahead of the event. It showed in a new analysis that since 1970 nuclear reactors have avoided the emission of 72 billion tonnes of carbon dioxide worldwide, compared to the emissions that would have arisen had coal-fired generation been used instead.



Reporting on nuclear energy

WNN provides comprehensive coverage of developments in the nuclear power sector using background information, expert commentary and links to relevant authoritative sources. In 2022, WNN is celebrating its 15th anniversary. On a daily basis WNN reports free of charge accurate and dependable information which is easily accessible through its website, as well as in daily and weekly emails and on its social media channels. The number of visitors to the WNN website rose by 52% in 2021, with page views up 30%, to more than 5 million. There were also big increases in followers on Twitter and LinkedIn. As well as its news reports, WNN's *Perspectives* section features opinion pieces from industry leaders on key nuclear topics.

Where is WNN's audience from?



Alex Hunt, Editor, World Nuclear News



Visitors to WNN website: **1.7m**
(an increase of 52%)

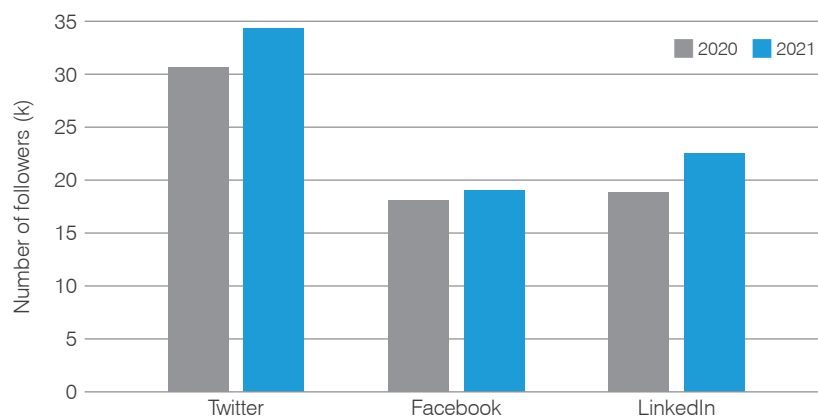
Twitter followers: **45.5k**
(an increase of 15%)

Facebook followers: **145.8k**
(a decrease of 0.6%)

LinkedIn followers: **29.6k**
(an increase of 26%)



World Nuclear Association annual change in the number of followers



Visitors to the World Nuclear Association website: **3.5m**
(an increase of 14%)

Views of Information Library: **5.4m**
(an increase of 9%)

Twitter followers: **34k**
(an increase of 12%)

Facebook followers: **19k**
(an increase of 6%)

LinkedIn followers: **22.5k**
(an increase of 19%)

YouTube followers: **900+**
(an increase of 45%)

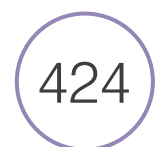
Uniting the industry through innovative events

Every year World Nuclear Association hosts events that provide a global forum and commercial meeting place for industry representatives. In 2021, the Association adapted to the challenges posed by the Covid-19 pandemic and proved its resilience by holding several high-level and innovative virtual events, including the World Nuclear Association Symposium, World Nuclear Fuel Cycle 2021 conference, and several topical Strategic eForums.

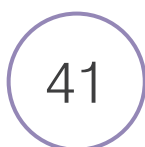
World Nuclear Association Symposium

The World Nuclear Association Symposium is an annual event for the nuclear community that takes place every September in London, UK. In 2021, the Symposium took place virtually and attracted industry leaders and experts from nearly 40 countries. The event's topics included: nuclear energy, climate change and sustainable development; prospects for small modular reactors; communications; and the launch of the 20th edition of -. All registered delegates had access to watch the recordings of all sessions on-demand.

Symposium key statistics



Participants



Speakers



Sessions



For more than 40 years, the annual nuclear Symposium has been not only an opportunity to hear about the latest developments in the nuclear world, but also a chance to meet up with friends, old and new. This year, we celebrate the 20th anniversary of World Nuclear Association. With a new name and renewed purpose over the last 20 years, the Association has grown both in membership and in reputation.



Philippe Knoche
Chairman of World Nuclear Association

World Nuclear Association Strategic eForum series

As part of our Strategic eForum series, launched in 2020, the Association held three virtual events bringing together high-level speakers and discussing key industry issues. The first Strategic eForum of 2021, on the topic of *Sustainable Finance*, took place in March and discussed the financial conditions needed for cost-effective investment in nuclear energy. The second, *Nuclear Innovation: Thinking Outside the Dome*, took place in June, and the third, *Committing to Net-Zero*, took place in October, ahead of the COP26 conference. All events and interviews with industry leaders were recorded and are available to watch on www.worldnuclearforum.com.

Strategic eForum key statistics across the three events

1235

Participants

2590

Views on YouTube

World Nuclear Fuel Cycle

The World Nuclear Fuel Cycle (WNFC) conference, run annually in collaboration with the Nuclear Energy Institute, provides an international forum to discuss issues affecting the nuclear fuel cycle, with leading industry experts providing insights to help participants navigate the complex fuel marketplace. In 2021 the conference was held virtually, but it usually takes place in a different location each year, enabling people from all continents to attend.

Scheduled events in 2022

25 - 26 April

Working Group Meetings, London, UK and Virtual

26 - 27 April

World Nuclear Fuel Cycle, London, UK and Virtual

5 - 7 September

Working Group Meetings, London, UK

7 - 9 September

World Nuclear Association Symposium, London, UK

Industry Cooperation through Working Groups

Working Groups are forums for the Association's members and invited observers to share leading practice, conduct analysis and develop consolidated positions on a wide range of important industry issues. Working groups act as the interface for the industry at organizations that set the policy framework for nuclear power, such as the IAEA or the International Commission on Radiological Protection (ICRP). Each group is chaired by an expert from a member company and has a Board member assigned as a mentor. Technical and administrative support is provided by the Secretariat.

While each Working Group has its own agenda, they share the following objectives:

- Find solutions to common industry issues.
- Determine market trends in their sector.
- Encourage harmonized requirements at an international level.
- Ensure that regulations enable effective nuclear operations.

Alongside the Working Groups, Advisory Groups provide guidance and support to the Secretariat on various strategic topics for the nuclear industry:



Advisory Panel

Chair: Tim Gitzel (Cameco)

Deputy Chair: Clark Beyer
(Global Fuel Solutions)

Staff Director: Virginie Ryan-Taix

The Advisory Panel seeks to identify challenges facing the global nuclear industry, opportunities to advance its position in policy arenas, and ways to improve the public acceptance of nuclear energy.



Communication Group

Chair: Jayne Hallett (Urenco)

Deputy Chair: Adrian Bull
(National Nuclear Laboratory)

Staff Director: Kristina Valen

The Communication Group shares new ideas and best practice for communication activities that help disseminate key messages to the wider industry and beyond.

Get Engaged with the Working Groups

Besides contributing to the advancement of the industry as a whole, participation provides individuals with the opportunity to:

- Networking and learn from peers.
- Obtain insights on the latest developments to inform business decisions.
- Raise their company's profile.

Michiko Kukihara

Sumitomo Corporation, Japan

WG: Transport



My team at Sumitomo has worked for many years on international transport arrangements for nuclear fuel materials. Because of various challenges associated with such operations, joining the Transport Working Group has been a great help in allowing us to raise issues and discuss ideas for solutions. We can share our concerns and the interest of the Japanese customers, who are looking for more transport options. We would like to continue to make progress through the Working Group in attracting more shipping companies into the market to stabilize and to further develop nuclear fuel transport routes to contribute to the industry.

Fuel Cycle Working Groups

Fuel Report

Co-Chair for Utilities: Julien Garrel (EDF)
Co-Chair for Suppliers: Malcolm Critchley (ConverDyn)
Staff Director: Olga Skorlyakova

The Fuel Report Working Group (FRWG) oversees the production of the Association's biennial *Nuclear Fuel Report*.



Sustainable Used Fuel Management

Chair: Mikhail Baryshnikov (TENEX)
Deputy Chair: Cecile Evans (Orano)
Staff Director: Joseph Deng

The mission of this Group is to shape industry positions with a view to engaging in the international debate on sustainable management strategies for the back end of the fuel cycle.



Fuel Cycle Members' Forum

Chair: Anna Bryndza (UxC)
Staff Director: Kaajal Desai

The Fuel Cycle Members' Forum gathers members to exchange the latest developments in nuclear fuel and trade.



International Network for Safety Assurance of Fuel Cycle Industries

Chair: Marcos Luis Merino (ENUSA)
Staff Director: Kaajal Desai

The mission of the International Network for Safety Assurance of Fuel Cycle Industries (INSAF) Working Group is to exchange safety-related best practices in order to maintain and develop safety at nuclear fuel cycle facilities.



Transport

Chair: Kurtis Hinz (TAM International)
Deputy Chair: Tony Grange (Westinghouse)
Staff Director: Serge Gorlin

This Group acts as a forum for communicating industry developments, exchanging leading practice, and for identifying and resolving issues relating to the shipment of nuclear material.

In Focus

The Fuel Report Working Group

The Fuel Report Working Group (FRWG) oversees the production of the Association's biennial *Nuclear Fuel Report*. The FRWG has over 80 members and this number continues to increase. Member experts cooperate on the report through six sub-groups: demand, uranium, conversion, enrichment, secondary supply, fabrication.

In 2021, the Association released the 20th edition of *The Nuclear Fuel Report*. This edition continues a positive trend in nuclear-generating capacity projections that began in the previous (2019) edition.

Over 40 meetings of the Working Group and various sub-groups took place over the 20-month cycle. These included meetings to discuss the outlook of specific countries, such as China, India and the USA.

The report compiles data from confidential surveys, international agencies and other public sources to produce projections of global nuclear fuel supply and demand over a 20-year horizon. It has become the leading reference source of the world nuclear industry.

Some improvements of the 2021 edition included:

- Revised and updated thermal efficiency parameters.
- Individual work with the global utilities to obtain questionnaire responses and more accurate reactor parameters.
- Revised methodology for primary conversion supply.
- Five-year uranium market review.
- New research of historical (1945-2020) uranium production.

The report featured new sections on:

- Japanese inventories (Secondary Supplies chapter).
- Trade issues (Uranium chapter).
- LEU+ and high-assay LEU (Enrichment chapter).
- Prospective market for high-assay LEU (Enrichment chapter).
- New fuel technologies, such as accident-tolerant fuel (Fuel Fabrication chapter).

An expanded summary of the 20th edition to be published in spring 2022 will describe the major conclusions of the report, in particular the supply-demand projections in different stages of the nuclear fuel cycle and the nuclear generation projections for the next 20 years.

Plant Performance Working Groups



Cooperation in Reactor Design Evaluation and Licensing (CORDEL)

Chair: Nawal Prinja (Jacobs)

Vice Chairs: Tom Bergman (NuScale), Shin Whan Kim (Kepco E&C)

Staff Directors: Allan Carson, Ronan Tanguy

The CORDEL Working Group has the goal of establishing international standardization of individual reactor designs and harmonization of approaches to licensing.

Capacity Optimization



Co-Chairs: Mike Baron (Global Nuclear Associates), Abderrahim Al Mazouzi (EDF)
Staff Director: Ronan Tanguy

The Group is a forum for discussing means by which nuclear power plant operators worldwide can improve the performance of their plants in areas such as maintenance and availability. Its recent focus, prompted by the average age of the global fleet reaching over 30 years, has been in the area of long-term operation (LTO).



Supply Chain

Chair: Laurent-Olivier Coudeyre (EDF)

Staff Director: Nathan Paterson

The Group's mission is to enable a robust, competitive and adaptive supply chain in support of all phases of a nuclear power plant's life cycle: design, construction, commissioning, operation and decommissioning.



Waste Management and Decommissioning

Chair: Mike Pieraccini (EDF)

Staff Director: Joseph Deng

The Group monitors international trends in waste management and decommissioning strategies and seeks to establish a consensus for a more effective system of nuclear waste management and decommissioning.



In Focus

The CORDEL Working Group

The CORDEL Working Group has the goal of establishing international standardization of individual reactor designs and harmonization of approaches to licensing. CORDEL is currently working with its six task forces covering a wide range of technical areas, while maintaining close cooperation with the IAEA, the OECD-NEA, and the various standards developing organizations (SDOs).

CORDEL Steering Committee

In 2021, the CORDEL Steering Committee noted that, in order to maximize the potential benefits of emerging reactor technologies and support decarbonization efforts, activities to facilitate harmonization should increase in both urgency and magnitude. As a result, CORDEL has been actively refreshing its action plan, increasing participation in its Task Forces and seeking further opportunities for closer collaboration with international bodies and regulators.

Design Maturity and Regulatory Expectations for Small Modular Reactors

To help support the deployment of emerging reactor designs, CORDEL published a report in June 2021 that describes the relationship between licensing processes in several countries and design phases of a reactor. *Design Maturity and Regulatory Expectations for Small Modular Reactors* highlights key safety case development considerations, technology challenges, and licensing activities. It emphasizes the importance of early engagement between SMR vendors and national regulators and recommends that national regulators collaborate through bilateral and multinational agreements on design and safety reviews to streamline licensing processes.

Following the publication of the report, CORDEL organized a webinar, *How can we streamline the licensing of Small Modular Reactors?* that attracted over 300 attendees. The webinar featured a diverse group of experts including regulators, project developers, and reactor vendors, to discuss various topics, including the variety of SMR designs, different licensing frameworks, opportunities and challenges of streamlining licensing approaches, and the need for greater international collaboration.

Different Interpretations of Regulatory Requirements

CORDEL's December 2021 report, *Different Interpretations of Regulatory Requirements*, shows that the nuclear industry is being held back by national approaches to regulation, turning what should be *nth*-of-a-kind projects into a series of first-of-a-kind

ones. If we are to take advantage of the opportunities emerging reactor designs provide, it is essential that governments, regulators, and industry alike, drive greater collaboration and implement a suitable framework that would allow a more streamlined approach to regulation.

Non-Linear Analysis Design Rules Part 3: Recommendations for Industrial Practices

The third and final part in the series on non-linear analysis design rules, published in December 2021, builds on the assessment of international non-linear analysis benchmark results. It proposes recommendations for industrial practices in non-linear analysis of safety-grade reactor components from the initial setting of parameters to the post-processing and interpretation of results. These results comprise linear mechanical analysis, plastic analysis, elastic fatigue analysis, and plastic fatigue analysis. The report makes recommendations to SDOs to consider as the basis of future harmonization efforts across mechanical codes and standards.

International Cooperation

2021 marked the start of a new opportunity for CORDEL as it took over the technical secretary position of the SDO Convergence Board for mechanical nuclear codes and standards.

Alongside this, CORDEL continues to work closely with many international organizations to influence the discourse and ensure that the industry is represented across international forums, examples of which include: the IAEA's SMR Regulators' Forum and the Nuclear Safety & Security Committee (NUSSC) to which CORDEL has provided input to draft work plans and safety standards such as the *Applicability of Safety Standards and Guides to Novel Advanced Reactors*. CORDEL also routinely engages in meetings and information exchanges with the Nuclear Energy Agency's Committee on Nuclear Regulatory Activities.

CORDEL's codes and standards-focused Task Forces, representing mechanical, and digital I&C, engage with SDOs such as International Electrotechnical Commission (IEC), Institute of Electrical and Electronics Engineers (IEEE), AFCEN, American Society of Mechanical Engineers (ASME), and Japan Society of Mechanical Engineers (JSME), to advocate for the harmonization of standards by presenting their work and providing feedback to standards committees.

Cross-Cutting Working Groups



Radiological Protection

Chair: Marcel Lips
(Kernkraftwerk Gösgen-Däniken)
Deputy Chair: Josip Zic
(McMaster University)
Staff Director: Keiyu Maruyama

The Group provides a means through which the industry can systematically oversee international developments in radiological protection research, standards and regulations.



Security

Chair: Robert Rodger
(UK National Nuclear Laboratory)
Deputy Chair: tbc
Staff Director: Nathan Paterson

The Group establishes the industry view on nuclear security matters with international stakeholders. It supports the Association's efforts to foster public confidence in the nuclear industry in the areas of security and the securing of materials under industry control.



Law

Chair: Chris White (Urenco)
Deputy Chair: Elina Teplinsky (Pillsbury)
Staff Director: Philippe Costes

This Group was established with a mandate to raise awareness of the legal issues and developments affecting the global nuclear industry amongst the membership of the Association, as well as to provide a forum to the members' legal representatives to discuss issues and development.



Economics

Chair: Milton Caplan (MZ Consulting)
Deputy Chair: Irina Skvortsova (Rosatom)
Staff Director: Philippe Costes

This Group's focus is on developing a better understanding of the economics and the capital costs of nuclear plants, notably new plants in both developed and developing countries. It also examines the competitiveness of nuclear energy in the overall generating mix.

Alejandro Lecinana

Conuar, Argentina
WG: INSAF, Radiological Protection



Since 2006 I have participated in INSAF meetings, as a CONUAR representative. The INSAF Working Group is a unique space for sharing good practice and operational experience between safety specialists of nuclear fuel cycle facilities. In this way, our organizations improve their performance, and what is also very important, we can show that safety is a strategic objective for our industry.

In Focus

The Radiological Protection Working Group

The RPWG provides a means through which the industry can systematically oversee international developments in radiological protection research, standards and regulations, including those by the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), International Commission on Radiological Protection (ICRP), IAEA, International Commission on Radiation Units and Measurements (ICRU), World Health Organization (WHO), OECD-NEA, radiation protection advisers (RPAs) and other relevant international organizations

The RPWG estimates the impact that any potential or new standards might have on the radiological protection aspects of the nuclear fuel cycle.

The RPWG engages with these international organizations to ensure due consideration is given to proportionality and implementability of any changes in the system for radiological protection.

Key achievements in 2021

- The RPWG took part in a virtual ICRP workshop, The Future of Radiological Protection, which discussed its consultation paper, *Keeping the ICRP Recommendations Fit for Purpose*. The RPWG produced a presentation looking at the recontextualization of the risk of low-dose radiation, the necessity to adopt a wider 'all-hazards' approach, and the need to avoid unnecessary revision of the radiological protection system.
- Working with the Waste Management & Decommissioning Working Group, the Group provided comments on the revision of a key IAEA safety standard (RS-G 1.7) relating to exclusion, exemption and clearance.
- The RPWG actively participated in annual meetings organized by the IAEA's Radiation Safety Standards Committee and the Emergency Preparedness and Response Standards Committee.
- Two technical papers written by the members of the Working Group were published by the Journal of Radiological Protection: *Reflection on the proposed changes to dose quantities – an industrial perspective*, and *Reflections on low-dose radiation, the misconceptions, reality and moving forward*.
- The RPWG was invited to join the WHO Radiation Emergency Medical Preparedness and Assistance Network (REMPAN) as an observer, and participated in the 16th coordination meeting.



Building Leadership Skills for the Nuclear Future

The internationally recognized World Nuclear University (WNU) training programmes provide a dynamic learning experience and facilitate global networking.

In 2021, a total of 274 international nuclear professionals attended WNU's programmes. In addition to launching a new, two-week virtual course, the Strategic Leadership Academy, WNU conducted its traditional School on Radiation Technologies online. WNU also hosted a virtual World Nuclear Industry Today course for Tsinghua University and a Nuclear English course for Rosatom.

WNU also announced the appointment of its new Director, Isis Leslie, to lead WNU's strategic direction and mission to provide world-leading nuclear training and development for a global network of organizations and educational institutions.



WNU Strategic Leadership Academy

The Strategic Leadership Academy 2021 on *Managing your nuclear power plant for the long-term* was held virtually over two weeks and featured over 40 speakers, action learning challenges, and mentored working group discussions. A total of 32 fellows from 18 countries, including six placements funded by the IAEA's Technical Cooperation Programme, attended the course.

>25 industry-leading speakers presented to the fellows, including representatives from IAEA, UNSCEAR, TRIUMF, NESCA and ANSTO.

6 expert mentors joined for the duration of the Academy, working individually and in small groups with the fellows.



This training is useful for any future leaders of nuclear plants worldwide, giving strong insights on the leadership aspects in a nuclear environment. The course is challenging but very enjoyable. You get to discuss challenges in a working group of people with different backgrounds from different parts of the world and a mentor to guide you through the scenarios each day. After this training, I have learned a great deal about long-term operation and enhanced my leadership skills.



Kushal Sengupta
Training & Communication Manager, EDF Mumbai Liaison Office

The World Nuclear Industry Today

The WNU short course World Nuclear Industry Today is designed to enhance attendees' knowledge about the status of nuclear energy in the world today and its likely developments. In July of 2021, WNU held a virtual week-long course for over 250 students from 25 universities. The programme covered a range of topics, including the role of nuclear outside of energy production, the digital transformation of nuclear energy, and international career opportunities in nuclear.

Communicating with Nuclear English

WNU's intensive Nuclear English language course helps participants prepare for English-speaking environments, enabling their day-to-day communication with colleagues, writing of effective reports, and participation at conferences. In September, WNU organized a customized online Nuclear English course for Rosatom Technical Academy. Twenty nuclear professionals attended the programme, featuring interactive scenarios simulating real-life situations faced by nuclear professionals, such as presenting at meetings and interacting with the public.

WNU School on Radiation Technologies

The School on Radiation Technologies (RT School) is a two-week intensive leadership and communication development programme for professionals in radiation technology fields, including radioisotope production. In October, 33 fellows from 18 countries attended WNU's RT School, held virtually for 2021. Over the two weeks, fellows heard from leaders in the radiation technology and radioisotope production fields and participated in leadership and communications-focused projects. The programme covered a broad range of topics, including industrial uses for radiation technologies, international radiation protection regimes and advances in radiation therapy. Fellows also had the opportunity to virtually tour the IAEA Seibersdorf Laboratories and a number of ANSTO's facilities, including the Open Pool Australian Lightwater (OPAL) multi-purpose research reactor.

WNU Events in 2022

19 June - 23 July

Summer Institute, Spain

Autumn

Strategic Leadership Academy



Governance and Organization

The Director General of World Nuclear Association, Sama Bilbao y León, is responsible for the running of the Association and is ultimately accountable to the Board of Management. The Board holds final approval on proposals made by the Director General, including strategic and budgetary decisions. Currently Philippe Knoche, Chief Executive Officer, ORANO, serves as Chairman of the Board, and Bohdan Zronek, Chief Nuclear Officer, ČEZ, holds the position of Vice-Chairman.

The Board of Management

The Board comprises senior executives from member companies who meet twice a year and serve for two years. Every two years a new Vice-Chairman is appointed. After one year's service, the Vice-Chairman takes on the role of Chairman for the next two years, before serving again as Vice-Chairman in the fourth year.

The Board fulfils all statutory duties pertaining to the Association's governance and sets policies and strategic objectives acting on proposals from the Director General.

To ensure balance among the elected members of the Board, each of the three categories of institutional membership – suppliers, generators and general – must be represented by at least two members.

Board members function as mentors for the various Working Groups. This enables the Board to monitor the activities of the groups and to shape their overall agenda.

In 2021, the Board met on 14 April and 7 September, and due to the ongoing Covid-19 restrictions, both meetings were held virtually.

There are also two Board sub-committees, whose members serve two-year terms and report directly to the Chairman of the Board:

- The Governance and Nominations sub-committee oversees appointments to the Board and manages Director General and senior staff succession planning.
- The Audit and Finance sub-committee conducts regular reviews of the financial health of the Association and holds in-depth dialogue with the auditor during the preparation of the annual accounts.

Audit

In March 2021, a full audit of the 2020 Annual Report and Accounts was conducted by Taylor Viney Marlow Ltd (TVM).

TVM concluded that the 2020 Annual Report and Accounts give a true and fair view of the state of the Association's affairs on 31 December 2020 in accordance with UK Generally Accepted Accounting Practice (GAAP) and they were subsequently approved and signed off by the Chairman and Board of Management on 26 April 2021.

The 2020 Annual Report and Accounts were presented at the annual general meeting (AGM) held virtually on 15 September 2021.

Membership meetings

There are two annual meetings where members are updated on the operations of the Association and can ask the Chairman and Director General questions. At the AGM, the accounts are presented for approval and any fee changes or alterations to the fee structure are put to a vote. Immediately after the AGM, the Members Council takes place, during which significant developments in the Association are presented to the member company representatives in attendance.

Board members

As of March 2022

Chairman



Philippe Knoche
Chief Executive Officer,
ORANO

Vice-Chairman



Bohdan Zronek
Chief Nuclear Officer,
ČEZ



Junjing An
General Manager,
CGN-Uranium
Resources Co.



George Borovas
Lawyer,
Hunton Andrews Kurth
LLP



Tim Gitzel
President & Chief
Executive Officer,
Cameco Corporation



**Leonam dos
Santos Guimarães**
Director for Planning,
Management and
Environment, Eletronuclear



Bryan Hanson
Executive Vice
President & Chief
Generation Officer,
Exelon Generation



Mingang Huang
Chief Economist,
China National Nuclear
Corporation



Kirill Komarov
First Deputy Chief
Executive Officer for
Corporate Development
& International Business,
ROSATOM



Shigenori Makino
Managing Executive
Officer, TEPCO



Takuma Nagase
General Manager,
Marubeni Corporation



Yoh-shik Nam
Executive Vice
President of Business
Growth Division, KHNP



Boris Schucht
Chief Executive Officer,
Urenco



**Karl Johan
Svenningsson**
Country Chairman,
UNIPER Sweden



Emmanuelle Verger
Head of the Fuel
Department,
EDF



Jay Wileman
President & Chief
Executive Officer, GE
Hitachi Nuclear Energy



Liudmila Zalimskaya
Chairman of the Board
of Directors,
TENEX



Mingguang Zheng
Senior Vice President,
SNPTC

Honorary



Hans Blix
Director-General
Emeritus, International
Atomic Energy Agency



Gerald Grandey
Former Chief Executive
Officer, Cameco
Chairman Emeritus

Secretariat

World Nuclear Association is made up of an international Secretariat of 34 people, covering a broad range of expertise and experience, who are responsible for coordinating the work that the Association does on behalf of its members. Most of the Secretariat work from the London office, with representatives also based in India and China. In 2021, the Association continued to follow the necessary measures in response to the Covid-19 pandemic to protect the Secretariat and reduce transmission of the virus. Despite the challenges posed by the pandemic, the Secretariat worked hard to ensure that nuclear energy makes a significant contribution to the world's sustainable future. The Secretariat is led by Director General Sama Bilbao y León. It is composed of four departments – Industry Cooperation; Communication; Finance and Administration; and World Nuclear University – and one project team for the *Harmony* programme.



Sama Bilbao y León
Director General



François Morin
Director, China



Shah Nawaz Ahmad
Senior Advisor, India,
Middle East and
South-East Asia



Philippe Costes
Senior Advisor

Harmony programme



King Lee
Director,
Harmony Programme



David Hess
Policy Analyst



Ian Hore-Lacy

World Nuclear Association mourns the loss of Ian Hore-Lacy, one of our longest-serving colleagues, who passed away on 2 December 2021. Ian joined World Nuclear Association in 2001 as Director for Public Communications, and later Senior Research Analyst. Most recently he served as a Senior Advisor to the Director General.

Ian single-handedly created the Association's Information Library, and has left an incredible legacy that will continue to benefit the nuclear community and scholars everywhere for many years to come. Ian was also a prolific author, having published six books on nuclear energy, sustainability and on Christianity between 1978 and 2018. He published 11 editions of a comprehensive and accessible book about nuclear power later issued as *Nuclear Energy in the 21st Century*, which has become the key reference for the World Nuclear University's Summer Institute.

Ian's kind personality, wisdom and intelligence will be sorely missed by his friends and colleagues at the Association and the global nuclear community.

World Nuclear University



Isis Leslie
Director



Raquel Heredia Silva
Training Manager



Karyna Zamani
Junior Training
Programme Coordinator

Communication



Virginie Ryan-Taix
Head of
Communication



Jonathan Cobb
Senior Communication
Manager



Jennifer Corander
Events Manager



Alex Hunt
Editor, WNN



John Lindberg
Public Affairs Manager



Claire Maden
Consultant Editor,
WNN



Brigita Mammetti
Visual Communication
Manager



Alec Mitchell
Senior Writer & Analyst



Richard Petrie
Graphic Designer



Warwick Pipe
Deputy Editor,
WNN



Stephen Tarlton
Writer & Analyst



Kristina Valen
Marketing &
Communication Manager

Industry Cooperation



Serge Gorlin
Head of
Industry Cooperation



Allan Carson
Project Manager,
CORDEL



Joseph Deng
Visiting Research Officer



Kaajal Desai
Programme Lead,
Fuel Cycle



Eunsung Kim
Visiting Research Officer



Keiyu Maruyama
Visiting Research Officer



Nathan Paterson
Senior Programme Lead,
Supply Chain



Olga Skorlyakova
Senior Project Manager



Ronan Tanguy
Project Manager,
CORDEL

Finance and Administration



Paul Kidman
Head of Finance and
Administration



Gabrielle Flannery
Office & Member
Relations Manager



Vivien Lotasz
Executive Assistant to
the Director General



Brian Musaindapo
IT Manager



Ana Rodriguez
Administration Assistant



Binita Shah
Accounts Assistant

Members

92 Energy Ltd
ABDAN
ABEN (Bolivian Nuclear Energy Agency)
ALARA Logistics
Alpiq Suisse S A
ARAO-Agency for Radwaste Management
ARMZ Uranium Holding Co
(JSC Atomredmetzoloto)
Association for Regional and International
Underground Storage (ARIUS)
Australia Nuclear Science and
Technology Organisation
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Indonesia
BHP Billiton
BofA Securities
Boss Energy Ltd
Bureau Veritas UK Limited
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Cameco Corporation
Canadian Nuclear Association
Canadian Nuclear Laboratories
Central Research Institute of
Electric Power Industry
CEZ a s
CGNPC Uranium Resources Co Ltd
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CIS Navigation
CLP Power Hong Kong Limited
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Czech Nuclear Association
Daya Bay Nuclear Power Operations and
Management Co Ltd
Deep Geo Repository Inc.
Deep Isolation Inc
Deep Yellow Limited
Denison Mines Corporation
Deugro France sarl
DIAMO
DMS s.r.o.
Edlow International Company
Electric Power Development Co Ltd
(J-POWER)
Electricite de France
Electronics Corporation of India Limited
Eletronuclear
ELINI - EUROPEAN Liability Insurance
for the Nuclear Industry
Emirates Nuclear Energy Corporation
Energatom
ENGIE
ENUSA Industrias Avanzadas SA
EPZ
Euratom Supply Agency
European Mutual Association for
Nuclear Insurance
Exelon Generation LLC
Fennovoima
FinNuclear Association
Fluor BWXT-Portsmouth
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GE Hitachi
Global Fuel Solutions
Global Nuclear Associates
GoviEx Uranium Inc.
Gowlings LLP
Greenland Minerals and Energy
Heathgate Resources Pty Ltd
Hitachi GE Nuclear Energy Ltd
Hokkaido Electric Power Co Inc
Hokuriku Electric Power Co Inc
Hunton Andrews Kurth LLP
HZC International
Iberdrola Generacion S.A.
IBRAE - Nuclear Safety Institute of Russian
Academy of Sciences
Idaho National Laboratory
Idemitsu Kosan Co Ltd
Imperial College London
Industrias Nucleares Do Brasil S.A.
ITOCHU Corporation
Jacobs Clean Energy Limited
Japan Atomic Power Co, The
Japan Nuclear Fuel Ltd
Japan NUS Co., Ltd
Japan Steel Works, The
Jordan Atomic Energy Commission
JSC Atomenergomash
JSC Atomstroyexport
Kairos Power LLC
Kansai Electric Power Co Inc
KAZATOMPROM
Kenya Nuclear Electricity Board
KEPCO E&C
KEPCO Nuclear Fuel Co., Ltd.
Kernkraftwerk Gösgen-Däniken AG
King's College London (Project Alpha)
Korea Atomic Energy Research Institute
Korea Electric Power Corporation (KEPCO)
Korea Hydro & Nuclear Power Co
Kyushu Electric Power Co
Laramide Resources Ltd.
Lightbridge Corporation
LRQA Group Limited
Marubeni Corporation
McMaster University
Mitsubishi Corporation Power Systems, Inc.
Mitsubishi Heavy Industries Ltd
Mitsui & Co. Energy Ltd
MOSAYK srl
Mozweli (PTY) Ltd t/a Mozweli Nuclear
Engineering
MVM Plc
MZ Consulting
NAC International
Namibian Uranium Association
National Nuclear Laboratory
New York Nuclear Corporation
NexGen Energy Ltd
NKENT Consulting LLC
North West University
Nuclear Electric Insurance Limited
Nuclear Fuels Corporation
Nuclear Power Ghana
Nuclear Power Plant Company
Bangladesh Limited
Nuclear Power Plants Authority (NPPA)
Nuclear Risk Insurers Limited
Nuclear Transport Solutions (NTS)
Nuclear-21
Nucleoelectrica Argentina S.A.
Nukem Technologies
NuScale Power, LLC
OKG Aktiebolag (formerly E.on Nordic)
Ontario Power Generation
Orano
Orano NCS GmbH
Orascom Construction
Paks II Nuclear Power Plant Private
Company Limited by Shares
Pillsbury Winthrop Shaw Pittman LLP
Plateau Uranium Inc.
Polskie Elekrownie Jądrowe sp z o.o.
PricewaterhouseCoopers
Rio Tinto plc
Rockett Science Inc.
Rolls Royce plc
ROSATOM State Atomic Energy Corporation
Rosca Solutions
Rosenergoatom Concern
RSB Logistic GmbH
Rusatom Overseas
Rusatom Service
Seaborg Technologies ApS
Segra Capital Management LLC
Shearman & Sterling LLP
Shikoku Electric Power Co Inc
Siemens Energy Global GmbH & Co. KG
Silex Systems Limited
SNPTC
Sojitz Corporation
South African Nuclear Energy Corporation
(Necsa)
State Company "Navoi Mining and
Metallurgical Combinat"
Sumitomo Corporation
Taiwan Power Company
TAM International Inc
Techsnabexport (TENEX)
Teollisuuden Voima Oyj (TVO)
Terrestrial Energy Inc
The University of Manchester
Thomas Thor Associates
Tohoku Electric Power Co Inc
Tokyo Electric Power Company Holdings, Inc.
TradeTech
TradeTech Energy LLC
TVEL Corporation
Ubaryon Pty Ltd
Uniper (Sydkraft Nuclear Power AB)
Uranium Corporation of India Ltd (UCIL)
Uranium Energy Corp.
Urenco Limited
UxC, LLC
Vattenfall
Vimy Resources Limited
Westinghouse Electric Co
WMC Energy
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