

## **IAEA International Ministerial Conference**

### **Nuclear Power in the 21st Century**

**Washington, DC, 26-28 October 2022**

### **Concluding Statement by the President of the Conference**

Thank you for participating in the International Ministerial Conference on Nuclear Power in the 21st Century, held in Washington DC, United States of America, from 26 to 28 October 2022. The conference was attended by around 800 participants, ministers, senior officials, policymakers, and experts from 69 Member States and 9 international organizations.

This conference was organized by the International Atomic Energy Agency (IAEA) in partnership with the International Energy Agency (IEA), in cooperation with the Nuclear Energy Agency (NEA) of the Organization for Economic Cooperation and Development (OECD). The conference was hosted by the Government of the United States of America through the Department of Energy.

The Conference provided a forum for the participants to engage in high-level dialogue on the role of nuclear energy in the transition to clean energy, and its contribution to sustainable development and climate change mitigation.

Participants discussed and exchanged views on the key issues related to the future of nuclear power. These included achieving net zero with

nuclear energy, the enabling environments for its wider deployment, the contribution of existing nuclear power plants, early deployment of advanced reactor and waste management technologies, and regulatory oversight.

### *Fulfilling the Promise: Achieving Net Zero with Low Carbon Nuclear Energy*

The conference participants agreed that nuclear power can make a significant impact on the decarbonization of the power sector, which is a necessary condition to reach net zero. The nuclear technology exists and is proven, with different designs of large water-cooled reactors providing massive quantities of carbon-free electricity in different parts of the world.

Advanced nuclear reactors, including Small Modular Reactors (SMRs), can contribute to the decarbonization of the power sector but can also open up new opportunities to decarbonize beyond power; for example, to provide heat for district heating and industry or to produce low-carbon hydrogen.

Nuclear power is currently the only low carbon technology that can produce electricity and heat at scale. All the energy sectors need to reach net zero, whether it's electricity, heat or hydrogen. Nuclear power is an essential building block of these transitions towards net zero.

Decreased use of nuclear power would make net zero ambitions more difficult, riskier and more expensive. Without more nuclear, energy systems would have to rely to an even greater extent on technologies that have not yet reached commercial viability.

Furthermore, nuclear power contributes to securing energy supply, producing electricity at predictable costs and enabling the massive expansion of wind and solar by providing dispatchable power and stabilizing grids. This is one of the reasons why in recent months governments around the world have been looking at nuclear power.

For developing countries, nuclear power represents an attractive and reliable option that can provide the secure and scalable power needed to support economic development, while helping them meet the objectives of the Paris Agreement and the Sustainable Development Goals.

### *Enabling Environment: Creating the Conditions for Wider Deployments of Nuclear Energy*

The development of a safe, secure, and sustainable national nuclear power programme requires a decades-long commitment by national policymakers, government institutions, law enforcement and industry. The role of the Government is to ensure their countries' energy security needs and key to that is ensuring the deployment of new nuclear power plants is on course and the transit to low carbon future is assured.

Strong stakeholder engagement and support is also needed throughout the process..

IAEA assists countries interested in nuclear power as part of their energy mix, as they put in place the technical capabilities, human resources, and legal and regulatory framework required to ensure an effective and comprehensive nuclear infrastructure.

The highest standards of nuclear safety, security and safeguards are important to all countries and their citizens. Demonstrated commitment to these standards and continued communication and engagement with both statutory and non-statutory stakeholders help build public confidence in nuclear energy and support continued access to the peaceful uses of nuclear science and technology.

*Strengthening the Fleet: Extending and Expanding the Clean Energy Contribution of Existing Nuclear Power Plants*

National policies and strategies are important to maintain and increase the contribution of operating nuclear power plants to carbon free energy production, while ensuring their economic sustainability and continued social benefits. A number of national policy makers and governments see the current operating fleet as an energy source with low greenhouse gas emissions, high load factor and flexibility, which supports grid stability.

The Conference noted that investments for constructing new plants or extending the operation of existing plants would promote the establishment of the strong and reliable supply chains needed to sustain the existing fleet and deploy future reactor technologies.

It was fully recognized that long-term operation of existing nuclear power plants provides the most effective means to maintain reliable low carbon generating capacity for the clean energy transition. To enable long-term operation, issues related to national policy, market conditions, technologies, regulatory requirements, human resources and infrastructures should be addressed during the decision-making and planning process.

Extreme weather events associated with climate change – such as storms, heat waves, floods and droughts – are an increasing threat to all energy infrastructure; nuclear power plants are not an exception. Consequently, the Conference encouraged governments to undertake necessary steps to help mitigate climate risks and introduce and implement climate resilience plans.

### *Charting the Course: Pursuing Early Deployment of Advanced Nuclear Technologies*

Advanced nuclear reactors offer significant potential benefits, including the possibility of lower costs, enhanced safety and security, greater resource utilization, and in the case of SMRs, the ability to be sited in locations unsuitable for larger nuclear plants.

Such advantages could allow nuclear energy to increase its global contributions to clean and resilient energy sources. At the same time, it is recognized that advanced reactors and nuclear fuel cycles will generate new wastes that will need to be managed.

Although spent nuclear fuel management continues to involve challenges both technical and social, innovations in storage, transport, and disposal continue to expand the possibilities for a safe and secure nuclear waste management system.

There are growing expectations from a wide range of stakeholders about the early deployment of advanced nuclear technologies. This decade will be key to accelerate the development of advanced nuclear power technologies, in order to proceed towards deployment, both for electric and non-electric applications, and significantly contribute to the decarbonization of the energy sector at the horizon of 2030 and beyond.

Several demonstration plants and first-of-a-kind SMR units are expected to be put in operation in the coming years, at least as far as the most mature technologies. The role of governments and public-private partnerships to advance demonstration projects is central to providing the necessary human and financial resources, and to creating favourable conditions, including a suitable and modern legal and regulatory framework.

The IAEA and international organizations are called upon to bring together top-level decision makers from governments, regulators, designers, technology holders, operators and end-users, in order to ensure overall coordination, common objectives and to promote and facilitate harmonization and standardization at the regulatory and industrial levels.

*Enhancing Confidence: Effective Regulatory Oversight for the Future of Nuclear Energy*

The successful and timely deployment of new reactor technologies depends upon efficient approaches for evaluating their safety and licensing their operation.

International regulatory cooperation is critical for enhancing global nuclear safety and security through the exchange of information, lessons learned, and good practices for reviewing and licensing new reactor designs. Potential obstacles to these exchanges need to be identified and addressed.

As multiple countries will be evaluating the same designs, often in parallel, regulatory bodies should focus their collaboration on making review and licensing processes as efficient as possible and harmonizing regulatory approaches. In that way, we will avoid unnecessary duplication, without compromising independent national responsibilities.

It is vital for countries with nuclear energy programmes to have strong, competent and independent regulatory authorities. National regulators should take advantage of IAEA safety standards and security guidance, peer review missions and technical advisory services, and regional networks in order to build domestic capacity and capabilities and strengthen the national regulatory framework.

### *SMR Supply Chain*

Key industry leaders discussed challenges to set up a robust supply chain to support a large spectrum of new advanced reactor systems for which the market still has to materialize, and possible solutions to accelerate the maturity of the supply chain and its qualification.

### *Reimagining Nuclear: Inspiring Youth*

The image of nuclear power is changing; instead of the inaccurate and antiquated association with nuclear weapons, nuclear power is increasingly associated with clean energy, clean air and sustainable development. A new generation of nuclear professionals, environmentalists and advocates from a diverse group of professions are using novel ways to portray nuclear as a clean and modern source of energy that can help achieve sustainable prosperity for all.

### *Gender parity in the nuclear field*

Since its inception, the nuclear field has never fully tapped into the vast potential and talent of women, half the world's population. But this too is changing.

There are more and more targeted opportunities for women to play an active role in nuclear science and technology, including in engineering. This includes creative policies that help women thrive in the nuclear field as well as initiatives such as the IAEA Marie Sklodowska-Curie Fellowship Programme, which offers scholarships to female students for master's degrees in nuclear related studies.

The conference welcomed the announcement of the IAEA Lise Meitner Programme. The programme will focus on retention of women in the nuclear field, by offering early career female nuclear professionals an opportunity to participate in a multi-week programme involving visits to nuclear facilities and specialized training. The programme was launched with the United States of America as inaugural partner.

### *Nuclear Safety and Security*

Several Member States called upon the Russian Federation to immediately cease all actions at and around the nuclear facilities in Ukraine and recalled that the seven indispensable pillars of nuclear safety and security outlined by the IAEA Director General must be

upheld. Member States appreciated the proactive role of the IAEA in efforts to ensure nuclear safety and security in Ukraine.

### *Conclusions*

Many Member States recognised nuclear as a low-carbon, energy dense and proven technology. This is essential to meeting global net zero targets, contributing to their energy security, and providing a reliable and solid foundation for power generation on which renewable technologies can build.

The Conference agreed that the role of government is important in setting up nuclear power programmes and legal frameworks; industry and governments must deepen partnerships in the maintenance and modernization of existing fleets to ensure their long-term viability; and international cooperation should be pursued for the early introduction of advanced reactors and fuel cycles. Member States also noted the importance of a secure fuel supply is, not only for the existing fleet but also for advanced reactors.

The Conference recognized that standards and guidelines need to meet the requirements of the 21st century and we should pursue their modernisation where necessary to ensure that they remain fit for purpose, efficient and take full account of new technologies both as risks and opportunities for the nuclear sector.

The Conference stressed that the use of nuclear power must be accompanied at all stages by commitments to and ongoing implementation of the highest levels of nuclear safety, security and safeguards, consistent with the IAEA safety standards and security guidelines and international obligations. Building strong, positive and long term relationships with all stakeholders remains a key factor for the success of nuclear energy projects.

The Conference encouraged the use of new and creative ways of communicating and engaging stakeholders for clear and science-based understanding of the benefits and risks of nuclear technology. The Conference highlighted the importance of increasing the number of women in the nuclear field and welcomed the initiatives undertaken to achieve gender parity.

The Conference recognized the important roles of the IAEA, IEA and NEA in encouraging, promoting, facilitating and coordinating international cooperation among their Member States to ensure that nuclear energy achieves its full potential in contributing to the clean energy transition.

Recognizing the key role this forum plays in bringing together the international community to chart the future of nuclear energy, participants looked forward to the next International Ministerial Conference on Nuclear Power in the 21st Century in four years' time.