



INSC Position Statement on Sustainability in the Energy Sector

The concept of sustainability (in energy), rightly at the forefront of people's concerns, is in many instances not properly defined, and therefore misused. In some people's minds, sustainability is limited to environment protection ("green"). This is by far too short seeing.

Energy policy is to be built on three pillars: environment protection (indeed), but also economics and affordability, and security and reliability of energy supply. Each pillar is of importance to contribute to societal sustainability, a larger definition, much more in line with the original concept of Brundtland as "a development that meets the needs of the present without compromising the ability of future generations to meet their own needs".



Depending on individual priorities, one will give more weight to one pillar over the others, but an analysis based on facts and science shows that a balance must be struck between the three. There is no silver bullet, a perfect energy source matching the three pillars all together.

Each individual energy source must be analysed with pro and cons versus the three pillars. But even more, it is the whole energy system, integrating the contribution of the different sources, which must be considered.

The INSC considers that nuclear energy, as a fully decarbonised, affordable, secure and reliable energy source, has to play a major role in a sustainable energy system.

References

1. Deffrennes, M. (2022). Role of nuclear fission energy from past to future: Critical issues: Energy policy and market design, cost control, innovation and flexibility. In *Fundamental Issues Critical to the Success of Nuclear Projects* (pp. 3-22). Woodhead Publishing.
2. Boucau, J. (2021). *Fundamental Issues Critical to the Success of Nuclear Projects*. Elsevier Science & Technology.



INSC Position Statement on Small Modular Reactors

For the purpose of this International Nuclear Society Council (INSC) position statement, small modular reactors (SMRs) are defined as nuclear reactors with power outputs of 300 MWe or less per module and include both light water reactor (LWR) and non-LWR advanced reactors. While the existing nuclear power plants have been successfully supplying carbon-free electricity economically and will continue to do so for many countries in foreseeable future, the small size and modular nature of SMRs have potential to meet rapidly changing world carbon-free energy demand with improved flexibility.

The smaller size of SMRs means that most systems can be manufactured and assembled in the factory, compared to traditional LWRs, for which a larger fraction of the work must be done on the construction site. As a result of automation, factory fabrication offers an opportunity to achieve high quality, along with repeatability, which can lead to improved standardization and lower costs. SMRs have inherent safety features due to smaller reactor core size permitting reduced emergency planning zones. Thus, SMRs can be located closer to population centers, and the siting flexibility implies that energy can be supplied near the demand, minimizing investment in transmission.

The modular approach permits investment requirements to be more gradual and levelized over the years. Moreover, some SMRs operate at high temperatures and are particularly well-suited for both electricity generation and other energy applications such as process heat and hydrogen production. SMRs are designed for high operational flexibility in addition to reliability, and therefore are able to complement variable renewable energy sources and support society with clean energy.

The International Nuclear Society Council calls on all parties to recognize the near-term opportunity presented by SMRs to provide safe, reliable, clean, and affordable energy to meet the demands of society for clean energy. INSC supports advancing the R&D, testing, regulations, manufacturing capabilities and policies necessary to enable the deployment of first-of-a-kind SMRs, leading to a broad use of standardized reactors and to a possible global deployment of these technologies in the near future. INSC sees that the investment in SMRs is an additional support to the successfully operating and under construction large reactors, and it is justified by further expanding the role of nuclear energy in the world.



What is INSC

- *The International Nuclear Society Council (INSC) is an organization made up of Nuclear Societies from all over the world. Member Societies represent more than 80,000 nuclear professionals.*
- *INSC acts as a global forum for Nuclear Societies to discuss and establish common aims and goals.*
- *INSC represents the views of professionals and workers in the nuclear field through their Nuclear Societies.*
- *INSC was founded on 11th November 1990 by the INSG, an international group of Nuclear Societies.*
- *INSC holds the Non-Governmental Organization Status of IAEA and UNEP.*

INSC Objectives

- *To be a global forum for Nuclear Societies to discuss and establish common aims and goals.*
- *To act as a global Non-Governmental Organization in nuclear matters of international nature.*
- *To represent the views and positions of professionals and workers in the nuclear field through their Nuclear Societies.*
- *To value the work and achievements of the nuclear community of the world based on ethical principles adopted by the Nuclear Societies.*
- *To increase the operational efficiency of Nuclear Societies by establishing means for cooperation and complementation in the execution of their programs.*

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