The background features a dark green gradient with a bright, glowing sun in the upper left quadrant. A complex network of thin, white lines radiates from the sun, creating a web-like pattern across the page. The top edge has a layered, paper-cut effect with wavy, overlapping green shapes in various shades.

# 2

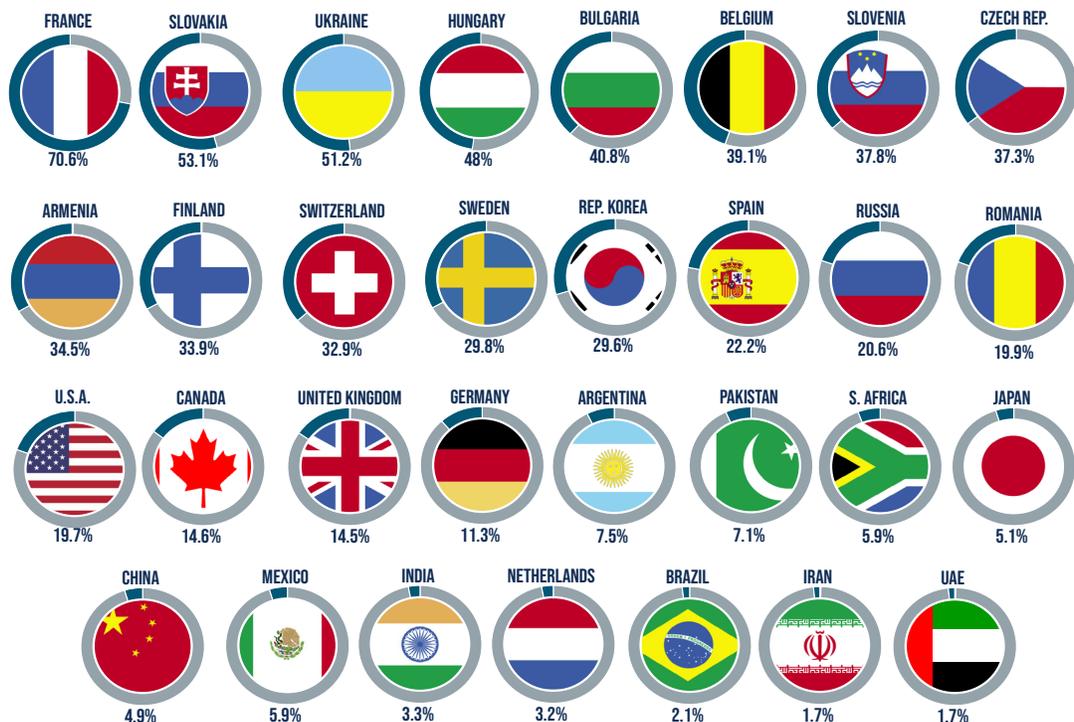
## NUCLEAR ENERGY IN THE U.S. AND WORLDWIDE

# WORLDWIDE ELECTRICITY GENERATED BY COMMERCIAL NUCLEAR POWER

Nuclear reactor technology was first developed in the 1940s, initially for producing weapons, but President Dwight D. Eisenhower's Atoms for Peace program shifted the focus to power generation, scientific research, and the production of medical and industrial isotopes. Today, nuclear technology is global, and nuclear-generated power is a part of the worldwide energy portfolio.

As of June 2021, there were 444 operating reactors in 30 countries with a total net capacity of 394,229 megawatts electric (MWe). In addition, 51 reactors were under construction. Based on data from 2020, France had the highest portion (70.6 percent) of total domestic energy generated by nuclear power.

**Figure 8. Nuclear Share of Electricity Generated by Country.**



In addition to generating electricity, nuclear materials and technology are used worldwide for many other peaceful purposes, such as the following:

- *Radioactive isotopes help diagnose and treat medical conditions*
- *Irradiation makes food safer and last longer, and assists in making pest-resistant seed varieties with higher yields*
- *Nuclear gauges maintain quality control in industry*
- *Radioactive isotopes date objects and identify elements*

The NRC engages in international activities to exchange regulatory information to enhance the safe and secure civilian use of nuclear materials and technologies.



**APPENDIX**

See Appendix R for the number of nuclear power reactor units by nation; Appendix S for nuclear power reactor units by reactor type, worldwide; and Appendices X, Y, and Z for lists of international activities, including conventions and treaties, bilateral information exchange and cooperation agreements, multilateral organizations in which the NRC participates, and list of export and import licenses.

# INTERNATIONAL STRATEGY 2021–2025

The NRC is well-respected internationally in nuclear safety and security regulation. The agency's International Strategy builds directly on the Commission's 2014 International Policy Statement and has two primary aims:

- *Leverage this reputation to positively influence the development of new, and maintenance of existing, nuclear safety and security regimes around the world; and*
- *Target the staff's international engagement to opportunities that will directly inform the agency's domestic mission objectives.*

The strategy consists of five objectives to guide the agency's international engagement and ensure that the agency's activities positively influence global nuclear safety and security, align with U.S. Government policy priorities, and promote strong cooperation with international regulatory partners. The objectives are as follows:

## EXCEL



**Maintain excellence in executing the NRC's statutory and legally mandated activities.**

- *Successfully execute the U.S. Government's export and import mandate for nuclear equipment, components, and materials and contribute to meeting U.S. obligations under nuclear safety, security, and nonproliferation conventions, treaties, and U.S. Government commitments.*

## INTEGRATE



**Integrate the agency's international activities with broader U.S. Government foreign policy and national security objectives.**

- *Frequent engagement with the Executive Branch about how the NRC can complement U.S. foreign policy or national security objectives, recognizing the NRC's nonpromotional status and independence and areas where policy restrictions may influence the direction of the agency's work.*

## PARTNER



**Build and maintain partnerships in specific regions of strategic importance to the United States that will support governmentwide objectives and enable the agency to learn from its counterparts and advance its domestic mission.**

- *Establish and maintain strategic global partnerships in all regions in targeted ways; promote domestic and global nuclear safety and security by creating and taking advantage of opportunities to increase cooperation; and gain valuable information to use as a benchmark for the agency's domestic activities.*

## LEAD



**Demonstrate leadership in the international community through involvement in key bilateral and multilateral forums in areas of strategic importance to the NRC and U.S. Government.**

- *Positively influence the global nuclear safety and security regime to develop regulatory frameworks that emphasize safety and security as a foremost objective, in a manner that promotes or is consistent with the NRC's domestic regulatory approach.*

## ASSIST



**Advance nuclear safety and security worldwide by providing regulatory assistance to countries with emerging regulatory programs, with a focus on countries of strategic importance to the broader U.S. Government.**

- *Countries receiving NRC capacity-building support will make advances in developing a sound, independent, technically competent, adequately resourced nuclear safety and security regulatory infrastructure that mirrors key tenets of the NRC's regulatory infrastructure and approach.*

# INTERNATIONAL ACTIVITIES

The NRC's international activities support the agency's domestic mission, as well as broader U.S. domestic and international interests. The wide-ranging activities include the following:

- *convention and treaty implementation*
- *nuclear nonproliferation*
- *export and import licensing for nuclear materials and equipment*
- *international nuclear safety, security, and safeguards cooperation and assistance*
- *cooperative safety research*

The NRC works with multinational organizations, such as the International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (OECD/NEA), and bilaterally with regulators in other countries through cooperation and research agreements. These interactions allow the NRC to share and acquire regulatory safety and security best practices. In addition, joint research projects give the NRC access to research facilities not available in the United States.

## *Conventions and Treaties*

All countries that ratify nuclear-related conventions and treaties must take actions to implement them. Their actions help ensure high levels of safety and security. For example, the NRC actively participates in and provides leadership for the implementation of the Convention on Nuclear Safety. The objectives of the Convention are to maintain a high level of nuclear safety worldwide, to prevent accidents with radiological consequences, and to mitigate such consequences should they occur.

In addition, the NRC's international cooperation and assistance activities, as well as import and export licensing of nuclear materials and equipment, fulfill U.S. obligations undertaken under the treaty on the Non-Proliferation of Nuclear Weapons, which says that all parties to the Treaty have the right to participate in the fullest possible exchange of equipment, materials, and scientific and technological information for the peaceful uses of nuclear energy, provided that they meet their nonproliferation obligations. The NRC therefore participates in review meetings and associated activities under this treaty.

The NRC also actively participates in meetings and activities for the following conventions:

- *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management*
- *Convention on the Physical Protection of Nuclear Material and Its Amendment*
- *Convention on Early Notification of a Nuclear Accident*
- *Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency*

## *Export and Import Licensing*

The NRC reviews applications to license exports and imports of nuclear materials and equipment to ensure that such exports and imports will not be inimical to the safety and security of the United States and will be consistent with applicable agreements for the peaceful use of nuclear materials. The NRC's export and import regulations are found in Title 10 of the *Code of Federal Regulations* Part 110, "Export and import of nuclear equipment and material."

The NRC participates in meetings of the Nuclear Suppliers Group and the Code of Conduct on the Safety and Security of Radioactive Sources (see the Web Link Index for the Code of Conduct) to ensure that U.S. export and import controls are appropriate.

## *Bilateral Cooperation and Assistance*

The NRC has information-sharing agreements with more than 45 countries, as well as Taiwan and the European Atomic Energy Community (see Appendix X for the list of the NRC's bilateral information exchange and cooperation agreements).

## ***Cooperation***

The NRC participates in a wide range of programs that enhance the safety and security of peaceful nuclear activities worldwide. With countries that have mature nuclear power or radioactive materials programs, the NRC focuses on sharing information and best practices.

Some of the benefits of consulting with mature regulatory programs include the following:

- *awareness of reactor construction activities that could apply to new reactors being built in the United States*
- *prompt notification to foreign partners of U.S. safety issues and vice versa*
- *sharing of safety and security information*

## ***Assistance***

The NRC provides bilateral and regional capacity-building support, training, workshops, and peer reviews to assist countries as they develop or enhance their national nuclear regulatory infrastructures and programs.

## ***Foreign Assignee Program***

The NRC provides long-term, on-the-job assignments to foreign regulators at the NRC through its Foreign Assignee Program. This helps both organizations better understand each other's regulatory programs, capabilities, and commitments. It also helps to enhance the expertise of both foreign assignees and the NRC staff. The program also fosters relationships between the NRC and key officials in other countries. Since the program's inception in 1975, the NRC has hosted more than 400 foreign assignees.

## ***Foreign Trainee Program***

The NRC provides opportunities for engineers, scientists, and regulatory personnel from other countries to attend NRC training courses at the Technical Training Center and Professional Development Center.

## ***Multilateral Cooperation and Assistance***

The NRC plays an active role in the different programs and committee work of multilateral organizations. The agency works with multiple regulatory counterparts through the IAEA, OECD/NEA, and other multilateral organizations on issues related to—

- *safety research and development of standards*
- *radiation protection*
- *risk assessment*
- *emergency preparedness*
- *waste management*
- *transportation*
- *safeguards, physical protection, and security*
- *training, communications, and public outreach*

## ***International Cooperative Research***

The NRC participates in international cooperative research programs to share U.S. operating experience and to learn from the experiences of other countries. This helps leverage access to foreign research data and test facilities otherwise unavailable to the United States.