



Ensuring Safe Proliferation of Nuclear, and Green Technologies to the Third World



Tables of contents

| | |
|--------------------------------------|-----------|
| Overview | 2 |
| Definition of important terms | 4 |
| Timeline of key events | 6 |
| Position of key nations | 8 |
| Suggested solutions | 10 |



Overview

The safe proliferation of nuclear and green technologies to developing nations represents a critical juncture for the United Nations Economic and Social Council (ECOSOC) as it seeks to balance rapid economic growth with global climate commitments[1]. As the developing world advances, the trend toward urbanization is projected to significantly increase the demand for electricity, creating a pattern of energy consumption similar to that of advanced economies[4]. To meet this demand without exacerbating the threat of climate change and ocean acidification, the international community must facilitate a transition toward energy sources that are substantially carbon-free. Nuclear power is currently the most significant source of greenhouse gas-free energy available, and approximately 30 to 37 countries—ranging from sophisticated economies to developing nations—are now considering or planning their first nuclear power programs [6].

These emerging "green windows of opportunity" allow developing nations to achieve technological leapfrogging, adopting frontier technologies like green hydrogen and Small Modular Reactors (SMRs) without being encumbered by the legacy systems or experimental risks faced by early adopters[7]. Small Modular Reactors, in particular, are viewed as a practical framework for enhancing energy security in developing nations because they are more manageable for smaller grid systems and require less initial capital than traditional large-scale plants[1]. Beyond electricity generation, nuclear science offers essential solutions for other Sustainable Development Goals (SDGs), including improving food security through advanced agriculture and treating non-communicable diseases like cancer through nuclear medicine[9]. The global green industrial revolution is projected to generate an economic dividend of approximately \$10.3 trillion by 2050, representing a massive opportunity for developing nations to diversify their economies and move toward more sustainable industrial sectors[7].

However, the expansion of these technologies brings inherent safety and security challenges that require a robust international "backstop" to prevent accidents and illicit activities[1]. A primary concern is that the spread of nuclear technology could enable more countries to pursue fuel-cycle activities, such as uranium enrichment or chemical reprocessing, which present significant proliferation threats. While the Nuclear Non-Proliferation Treaty (NPT) recognizes the "inalienable right" of all parties to use nuclear



energy for peaceful purposes, this right is contingent upon adherence to International Atomic Energy Agency (IAEA) safeguards and inspections. Furthermore, the "nuclear taboo"—a public aversion to nuclear power fueled by historical accidents like Chernobyl and Fukushima—remains a formidable barrier to adoption that necessitates greater transparency and a strengthened global "safety culture"[8].

Despite the clear benefits, developing nations face significant structural barriers to implementation, including a lack of regulatory expertise and insufficient national grid infrastructure[11]. Many new entrants do not yet have the strong cadre of nuclear engineers and scientists required to license and operate these facilities, leading to a reliance on "turnkey" projects from established nuclear states like Russia and China. Furthermore, the digital capacity divide—driven by uneven investment in research and development—limits the ability of poorer economies to fully leverage green technologies. Sustainable Development Goal 17.7 explicitly calls for the transfer and diffusion of environmentally sound technologies to developing countries on favorable and concessional terms, yet international cooperation must evolve beyond traditional donor-recipient relationships to build holistic socioeconomic infrastructure.

In summation, the proliferation of nuclear and green technologies is an economic and environmental necessity, but it must be managed through a framework that ensures safety, security, and equity. The transition to a low-carbon future hinges on the successful integration of these innovative tools into the development strategies of the "Third World" while maintaining the integrity of the global non-proliferation regime. Delegates must navigate the complexities of financing capital-intensive projects, building regulatory competence, and fostering public acceptance of advanced technologies. It is the responsibility of this council to propose concrete policies that will empower developing nations to seize these green windows of opportunity while safeguarding the global community from the risks associated with technological expansion[9].



Definitions of important terms

Nuclear Proliferation

Nuclear proliferation refers to the spread of nuclear weapons, fissile material, and weapons-applicable nuclear technology and information to nations which are not recognized as "Nuclear Weapon States" by the Nuclear Non-Proliferation Treaty[9]. While civilian nuclear technology can be adapted for military purposes, the international non-proliferation regime seeks to provide security and encourage cooperation in peaceful uses while preventing the diversion of materials into weapons programs[8].

IAEA Safeguards

Safeguards are a set of technical measures applied by the International Atomic Energy Agency (IAEA) on nuclear material and activities, through which the Agency seeks to verify that nuclear material is not diverted to nuclear weapons or other explosive devices. These measures include material accountability, physical security, and containment and surveillance, acting as a "backstop" to provide assurance to the international community that states are honoring their peaceful commitments[11].

Additional Protocol

The Additional Protocol is a legal document that significantly increases the IAEA's ability to verify the peaceful use of all nuclear material in states with comprehensive safeguards agreements[13]. It grants IAEA inspectors expanded rights of access to information and locations, including short-notice inspections and environmental sampling, to provide credible assurance that there are no undeclared nuclear materials or activities in the country.

Small Modular Reactors (SMRs)

Small Modular Reactors are advanced nuclear reactors that have a power capacity of up to 300 MW(e) per unit, which is about one-third of the generating capacity of traditional nuclear power reactors. SMRs are viewed as a practical framework for enhancing energy security in developing nations because they are more manageable for smaller grid systems and require less initial capital than traditional large-scale plants.

Technological Leapfrogging

Technological leapfrogging is a development strategy where developing nations skip traditional stages of industrialization—such as heavy reliance on fossil fuels—by adopting advanced, sustainable technologies immediately. Being unencumbered by legacy infrastructure allows these "late-mover" economies to be more agile in adopting frontier



technologies at lower costs while avoiding the risks associated with slow initial uptake experienced by advanced economies.

Green Windows of Opportunity

Green windows of opportunity are specific periods where changes to policies, funding availability, and global demand allow developing economies to catch up or lead in green industrial sectors[6]. These windows are fueled by the urgent global push for sustainability and provide a chance for developing nations to bolster their role in greening global value chains and moving toward more productive economic sectors.

Nuclear Taboo

The nuclear taboo refers to a widespread public aversion or social stigma surrounding nuclear power and nuclear-related technologies. Often driven by historical background knowledge and negative imagery associated with previous nuclear accidents, this taboo poses a formidable challenge to expanded access to nuclear technology and necessitates effective risk communication and trust-building measures[11].

Baseload Power

Baseload power is the minimum amount of electric power that must be supplied to an electrical grid at any given time to meet the continuous demand of consumers. Nuclear energy is highly valued as a baseload source because it provides a stable, energy-dense supply of carbon-free electricity that is not subject to the intermittency of some renewable energy sources.

Sustainable Development Goal (SDG) 17.7

SDG 17.7 is a specific United Nations target that calls for promoting the development, transfer, dissemination, and diffusion of environmentally sound technologies to developing countries[7]. This transfer is intended to take place on favorable terms, including concessional and preferential terms as mutually agreed, to help bridge the divide in digital and industrial capacity between wealthier and poorer economies.

Connected Industrial Economy

A connected industrial economy is an interconnected network of intelligence and shared data—leveraging tools like digital twins, AI, and cloud-based engineering—to foster innovation and drive systemic efficiency. This cross-business connectivity allows industrial operations, including nuclear and renewable energy sectors, to monitor and optimize their operations in real-time, thereby reducing resource consumption and carbon emissions



Timeline of key events

1953: President Eisenhower’s “Atoms for Peace” Speech

This address to the United Nations General Assembly served as a foundational moment for international cooperation, proposing that the world’s nuclear stockpiles be diverted to peaceful purposes such as agriculture, medicine, and electricity generation. This initiative sought to transform the "immense and previously unimaginable power" of the atom into a tool for global development rather than a weapon of war[3].

1957: Establishment of the International Atomic Energy Agency (IAEA)

Created by a unanimous resolution of the United Nations, the IAEA was established to help nations develop nuclear energy for peaceful purposes while providing a technical framework for verification. Since its inception, the Agency has become the primary global "backstop" for ensuring that nuclear technologies are proliferated safely and transparently[11].

1968-1970: Signing and Entry into Force of the Nuclear Non-Proliferation Treaty (NPT)

The NPT established a "grand bargain" wherein non-nuclear-weapon states renounced nuclear weapons in exchange for the "inalienable right" to use nuclear energy for peaceful purposes under international scrutiny[11]. This treaty made assistance and technology transfer contingent upon adherence to IAEA safeguards, which successfully prevented the diversion of materials in dozens of nations.

1997: Adoption of the Model Additional Protocol Following the discovery of clandestine nuclear programs in countries like Iraq, the IAEA Board of Governors approved this protocol to significantly increase its ability to verify the peaceful nature of all nuclear activities[13]. The protocol grants inspectors expanded rights of access to information and locations at short notice, providing credible assurance that there are no undeclared nuclear materials in a country.

2009: Launch of the Integrated Nuclear Infrastructure Review (INIR) The IAEA began offering these comprehensive missions to help "new entrant" countries—such as Jordan, Indonesia, and Vietnam—evaluate the status of their national nuclear infrastructure. This



phased "milestone" approach helps developing nations build the necessary legal, regulatory, and technical foundations before commissioning their first power plants.

2015: Adoption of the 2030 Agenda for Sustainable Development The United Nations formally adopted 17 Sustainable Development Goals (SDGs), including SDG 17.7, which specifically calls for the transfer and diffusion of environmentally sound technologies to developing countries on favorable and concessional terms. This framework recognizes that technology transfer is essential for meeting climate goals and bridging the digital capacity divide[11].

2022: CSTD Meeting on “Green Windows of Opportunity” The UN Commission on Science and Technology for Development (CSTD) emphasized that sustainable frontier technologies offer a "window of opportunity" for developing economies to achieve technological leapfrogging[11]. The meeting highlighted how being unencumbered by legacy fossil fuel systems allows "late-mover" nations to adopt innovative green tools more agilely and at lower costs.

2023: COP28 Declaration to Triple Nuclear Energy Capacity At the United Nations Climate Change Conference (COP28) in Dubai, 22 nations pledged to triple global nuclear energy capacity by 2050 to meet net-zero targets[11]. This declaration reflects a shifting global consensus that views nuclear power as a vital, carbon-free baseload energy source necessary for a sustainable future.



Position of key nations

-Argentine Republic-

Argentina acts as a key regional provider of nuclear technology in South America, offering support to other developing nations for the design and construction of research reactors[4]. For instance, Argentina's INVAP built the Nur research reactor in Algeria and has signed cooperation agreements to help Bolivia develop its peaceful nuclear infrastructure. As an association country of the IEA, Argentina remains deeply integrated into international discussions regarding energy transition and the safe proliferation of nuclear science

-The People's Republic of China -

China functions as a major global provider and "First World" influence in the nuclear sector, taking a leading role in offering nuclear power plants, financing, and fuel services to emerging countries. It is a recognized Nuclear Weapon State under the NPT, though its imported nuclear facilities remain under IAEA safeguards[4]. Beyond nuclear technology, China is a central driver of the global green industrial revolution, contributing significantly to the diffusion of solar PV and biomass technologies through its robust manufacturing hub and 2006 Renewable Energy Law.

-The Republic of Finland-

Finland is an advanced economy and a member of the International Energy Agency (IEA), placing it among the First World nations that support global energy security through established technology. As an IEA member, Finland is part of the collective effort to bolster low-emissions power and address climate concerns through technological innovation. (Note: Further specific details on Finland's unique domestic nuclear stance are not extensively detailed in the provided sources beyond its IEA membership status)[6].

-The Republic of Kenya-

Kenya has been one of Africa's most proactive "new entrants," originally recommending the adoption of nuclear power in 2010 to meet rapidly growing electricity demand. The country has pursued a highly diversified partnership strategy, signing nuclear cooperation agreements with China, Russia, South Korea, France, and the United States,,,. However, the Kenyan government recently approved the dissolution of its Nuclear Power and Energy Agency (NuPEA) in early 2025, effectively putting its large-scale nuclear projects on hold while it transitions these functions to the Ministry of Energy.



-The Republic of the Philippines-

The Philippines is currently classified as an emerging nuclear nation with provisional plans for a nuclear power program, though a formal commitment is presently pending or deferred. The country has sought to diversify its international partnerships for nuclear development, looking toward providers beyond the traditional major state-owned enterprises of Russia and China. To ensure a safe and transparent path forward, the Philippines hosted an International Atomic Energy Agency (IAEA) Integrated Nuclear Infrastructure Review (INIR) mission to evaluate the status of its national nuclear infrastructure development.

-The Kingdom of Saudi Arabia-

Saudi Arabia serves as a regional leader in the Middle East for nuclear investigation, spearheading studies for regional nuclear power and desalination programs. The Kingdom has proposed specific power reactor programs and site proposals, though the exact timing for these projects remains uncertain[3]. As a signatory of the Nuclear Non-Proliferation Treaty (NPT), Saudi Arabia has cooperated with the IAEA on feasibility studies and has undergone an INIR mission to evaluate its readiness for technological expansion.

-The Republic of South Africa-

South Africa holds a unique position as the only country on the African continent currently producing nuclear energy, and it is a major global producer of uranium. The nation has actively engaged with the global safety regime, becoming the first country with an operating nuclear program to request an IAEA INIR mission in 2013. In the green technology sector, South Africa has developed advanced green hydrogen strategies that are consistent with its sustainable development goals.

-The United States of America-

The United States maintains the largest fleet of operational nuclear reactors in the world and serves as a primary provider of reactor designs and safety standards for emerging nations. Through the Inflation Reduction Act of 2022, the U.S. has implemented significant production tax credits to preserve its existing fleet and accelerate the deployment of next-generation advanced reactors. At the COP28 summit in 2023, the United States was one of 22 nations to pledge to triple global nuclear energy capacity by 2050 to achieve net-zero targets[3].



-The Republic of Zambia-

Zambia represents a Third World nation that has formed a strong strategic partnership with the Russian Federation to establish its nuclear infrastructure. Through multiple agreements signed with Rosatom since 2016, Zambia is training a new cadre of nuclear engineers in Russia to manage future facilities. The nation's primary goals for nuclear proliferation include preventing energy load-shedding and becoming a regional center for nuclear medicine and agricultural services via a planned 10 MW research reactor[7].

Suggested Solutions

The transition toward a sustainable energy future necessitates a sophisticated approach that balances the immediate needs of the Third World with the established safety standards of the First World[11]. As the developing world advances, its demand for energy is projected to grow significantly, eventually mirroring the pattern of consumption seen in Europe and North America. Member states must navigate the choice between providing immediate humanitarian relief and making long-term investments in industrial reconstruction through the transfer of innovative technologies. To ensure this process is equitable, international cooperation should move beyond traditional donor-recipient relationships, focusing on technology transfer as a holistic effort to build broader socioeconomic infrastructure in developing nations.

To address the financial barriers that prevent the proliferation of advanced technologies, the council should advocate for equitable financing models that acknowledge the capital-intensive nature of nuclear and green projects[4]. Since many emerging nuclear nations lack a strong cadre of specialized engineers and scientists, construction should be encouraged on a "turnkey" basis or through Build-Own-Operate (BOO) arrangements, where First World reactor vendors assume the initial technical and commercial risks[7]. For countries with smaller grid infrastructures, the deployment of Small Modular Reactors (SMRs) should be prioritized, as they prevent the grid instability that occurs when a single generating unit exceeds approximately 10% of total capacity. Furthermore, the international community must provide external support for green credit and infrastructure in low-income nations that lack the necessary domestic institutions to act unilaterally[4].

Policy reform is a vital component of ensuring that green technologies are viable in emerging markets, requiring governments to eliminate distortionary fossil fuel subsidies and import tariffs on green products. A teleological interpretation of Article IV of the Nuclear



Non-Proliferation Treaty (NPT) should be promoted to reaffirm the inalienable right of all nations to peaceful nuclear energy while maintaining strict adherence to International Atomic Energy Agency (IAEA) safeguards. Safe proliferation is best achieved through the adoption of the IAEA's phased "milestone" approach and the Additional Protocol, which grants inspectors the expanded rights necessary to provide credible assurance that there are no undeclared nuclear activities in a country[7].

Third World nations can achieve technological leapfrogging by adopting "connected industrial economy" tools—such as digital twins, AI-driven insights, and cloud-based engineering—to optimize industrial operations and reduce carbon emissions in real-time. The global community should also work to harmonize national safety regulations to ensure that minimum requirements are met everywhere, facilitating international trade and reducing the costs associated with country-specific modifications[5]. To bolster safety performance, the authority to determine actions for both safety and security should be vested in a single national body, ensuring that these two objectives reinforce rather than conflict with one another[13].

Finally, long-term sustainability depends on addressing the "nuclear taboo" through robust risk communication systems and transparency measures that replace negative historical narratives with the tangible benefits of nuclear science in medicine and agriculture[13]. Governments should prioritize vocational training and human resource development in nuclear science to ensure that new entrant nations can eventually license and operate their own facilities[12]. To ensure these "green windows of opportunity" result in inclusive growth, member states must cultivate local innovation ecosystems that empower women and marginalized groups to participate in the design and implementation of sustainable projects[8].



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