



International Atomic Energy Agency Background Guide 2019

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NATIONAL MODEL UNITED NATIONS

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Dear Delegates,

Welcome to the 2019 National Model United Nations Conference in Erfurt, Germany (NMUN • Germany)! We are pleased to introduce you to our committee, the International Atomic Energy Agency (IAEA). This year's staff is: Director Asra Shakoor and Assistant Director Markus Bianchi. Asra is a Specialist Policy Advisor for a Secretary of State in the UK Government with a background in politics. She has a Masters in Regulation from the London School of Economics and Political Science. Prior to this, she studied Politics and International Relations at Royal Holloway, University of London. Markus just received his B.A. in Political Science and Sociology and started his Master's in Political Science at the University of Trier.

The topics under discussion for the International Atomic Energy Agency are:

- I. Strengthening Safeguards and Verification
- II. Using Nuclear Technology to Achieve the Sustainable Development Goals

The IAEA is an independent intergovernmental organization of the United Nations, and it plays a critical role in promoting the peaceful uses of nuclear technology and ensuring the non-proliferation of nuclear weapons. The IAEA serves as a forum for the international community for scientific and technical cooperation in nuclear power and nuclear technology. The IAEA provides invaluable work in nuclear safety through its widely implemented safeguards and verification measures, establishing standards and guidelines for the use of nuclear material, equipment, and facilities, and works to facilitate technology transfers between its Member States. Though established outside the UN system, the IAEA reports to both the UN Security Council and the General Assembly.

This Background Guide serves as an introduction to the topics for this committee. However, it is not intended to replace individual research. We encourage you to conduct additional research, explore your Member State's policies in-depth, and examine the policies of other Member States to improve your ability to negotiate and reach consensus. In preparation for the conference, each delegation will use their research to draft and submit a [position paper](#). Guidelines are available in the [NMUN Position Paper Guide](#).

The [NMUN website](#) has many additional resources, including two that are essential both in preparation for the conference and as a resource during the conference. They are:

1. The [NMUN Delegate Preparation Guide](#), which explains each step in the delegate process, from pre-Conference research to the committee debate and resolution drafting processes. Please take note of the information on plagiarism, and the prohibition on pre-written working papers and resolutions. Delegates should not discuss the topics or agenda with other members of their committee until the first committee session.
2. The [NMUN Rules of Procedure](#), which includes the long and short form of the rules as well as an explanatory narrative and example script of the flow of procedure.

In addition, please review the mandatory [NMUN Conduct Expectations](#) on the NMUN website. They include the conference dress code and other expectations of all attendees. We want to emphasize that any instances of sexual harassment or discrimination based on race, gender, sexual orientation, national origin, religion, age, or disability will not be tolerated. If you have any questions concerning your preparation for the committee, please contact the Deputy Secretary-General Marleen Schreier at dsg.germany@nmun.org.

We wish you all the best in your preparations and look forward to seeing you at the conference!

Sincerely,

Asra Shakoor, Director
Markus A. Bianchi, Assistant Director

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Committee Overview

“The Agency shall seek to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world.”¹

Introduction

The International Atomic Energy Agency (IAEA) is an independent intergovernmental organization of the United Nations (UN) founded “in response to the deep fears and expectations resulting from the discovery of nuclear energy.”² The Agency’s creation began with a speech from President Eisenhower in front of the General Assembly in 1953 and was formalized with the unanimous adoption of the *Statute of the International Atomic Energy Agency* (the Statute) on 23 October 1956 by 81 Member States.³ Despite the passionate words of Eisenhower, the Agency had a rocky start due to the complicated political climate during the Cold War.⁴ However, in the aftermath of the Cuban Missile Crisis and the resulting concerns about nuclear weapons, the IAEA was able to launch its work effectively.⁵ The Agency’s position and influence was particularly strengthened through the growing number of Member States and the worrisome situations in many regions, such as the violations of the safeguard provisions by Iraq and the Democratic People’s Republic of Korea (DPRK) and the nuclear power plant catastrophe in Chernobyl.⁶

The International Atomic Energy Agency (IAEA) is an independent intergovernmental organization that reports to the United Nations General Assembly and Security Council.

During the recent 62nd meeting of the General Conference, the body voted on the budget update for 2019 and adopted the annual report of the IAEA for 2017.⁷ In addition to these items, the Member States discussed topics such as nuclear security, the Agency’s technical cooperation activities and cooperation in nuclear, radiation, transport and waste safety, and the IAEA’s safeguards in the Middle East and DPRK.⁸ Additionally, during the General Conference, the Scientific Forum was held under the topic Nuclear Technology for Climate Change.⁹ This discussion illustrated the importance in using nuclear science for the mitigation, monitoring and adaptation to global warming, increasing the use of low-carbon nuclear electricity, and adapting to the consequences of climate change, such as water scarcity, land degradation and an increase in animal diseases and insect pests.¹⁰

Governance, Structure, and Membership

The Secretariat, the General Conference, and the Board of Governors

The General Conference, attended by all IAEA Member States, is the highest policy body of the IAEA and meets annually.¹¹ Apart from the annual meetings, the General Conference can also be convened at any time by the Director General upon request of the Board of Governors or a majority of Member States.¹² The functions and powers of the General Conference are described in Article V of the IAEA Statute.¹³ The General Conference discusses and makes decisions on matters within the scope set in the IAEA Statute, including the election of the Board of Governors, the approval of the applications for membership, the

¹ UN Conference on the Statute of the IAEA, *The Statute of the IAEA*, 1956, Art. II.

² Fischer, *History of the International Atomic Energy Agency: The first Forty Years*, 1997, pp. 1-3; New Zealand Ministry of Foreign Affairs and Trade, *UN Handbook 2016-17*, 2016, p. 371.

³ Fischer, *History of the International Atomic Energy Agency: The first Forty Years*, 1997, pp. 1-3.

⁴ *Ibid.*

⁵ *Ibid.*

⁶ *Ibid.*

⁷ IAEA, *62nd IAEA General Conference (2018) Resolutions and Other Decisions*.

⁸ IAEA, *62nd IAEA General Conference (2018) Agenda*.

⁹ IAEA, *Nuclear Technology for Climate Change: Scientific Forum Opens*, 2018.

¹⁰ *Ibid.*

¹¹ IAEA, *IAEA General Conference*, 2016.

¹² UN Conference on the Statute of the IAEA, *The Statute of the IAEA*, 1956, Art. V.

¹³ *Ibid.*

appointment of the Director General, and the decision upon changes made to the IAEA Statute.¹⁴ Additionally, the General Conference has the power to suspend Member States, considers the annual report of the IAEA, votes on the budget suggested by the Board of Governors, adopts reports submitted to the UN, and approves agreement made between the IAEA and the UN or other organizations.¹⁵

The Board of Governors, which consists of 35 representatives of IAEA Member States and is elected by the General Conference, meets five times annually and makes recommendations to the General Conference concerning the IAEA's accounts, actions, and budget, and considers applications for IAEA membership.¹⁶ The Board also prepares the annual report of the IAEA on the activities and actions of the Agency, which is presented to the General Conference each year.¹⁷ Generally, the Board is responsible for carrying out the functions of the IAEA as outlined in the Statute and according to its responsibilities to the General Conference.¹⁸

The Secretariat is headed by the Director General and consists of four offices and six departments that carry out the day-to-day work of the Agency.¹⁹ The Director General's Office for Coordination, the Office of Internal Oversight Services, the Office of Legal Affairs, and the Office of Public Information and Communication provide administrative functions and support to the remainder of the Secretariat.²⁰ The Departments of Management, Nuclear Energy, Nuclear Safety and Security, Nuclear Sciences and Applications, Safeguards, and Technical Cooperation carry out the IAEA's work in promoting disarmament, nonproliferation, and peaceful use of nuclear technology.²¹

Member States

The IAEA currently has 171 Member States.²² The Member States of the UN and of specialized agencies can become Member States of the IAEA by signing and ratifying the IAEA Statute, or in the case a non-UN Member State, can become a member of the IAEA by accepting the IAEA Statute and by being accepted by the General Conference.²³ A particular situation exists concerning the states that are Member States of the IAEA but have not joined the *Treaty on the Non-Proliferation of Nuclear Weapons* (NPT) (1968), and the States parties to the NPT that are not Member States of the IAEA.²⁴ Currently, there are 189 States parties to the NPT and while India, Pakistan, DPRK and Israel have not joined the NPT, they are, with the exception of DPRK, Member States of the IAEA.²⁵

Mandate, Functions, and Powers

According to Article 2 of the Statute, the Agency aims to "accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world" and thus, the primary role of the IAEA is to ensure that atomic energy is used for safe, secure, and peaceful purposes.²⁶ The mandate is further defined by the provisions of the NPT, which establishes binding international law concerning nonproliferation of nuclear weapons, the disarmament of existing nuclear weapons systems, and the advancement of peaceful nuclear technology, thereby outlining the tasks and responsibilities of the IAEA.²⁷

¹⁴ Ibid.

¹⁵ Ibid.

¹⁶ IAEA, *Board of Governors*, 2016.

¹⁷ UN Conference on the Statute of the IAEA, *The Statute of the IAEA*, 1956, Art. VI.

¹⁸ Ibid.

¹⁹ IAEA, *Organizational Chart*, 2013; IAEA, *Employees & Staff: Strength Through Diversity*, 2016.

²⁰ IAEA, *Organizational Chart*, 2013.

²¹ Ibid.

²² IAEA, *List of Member States*.

²³ UN Conference on the Statute of the IAEA, *The Statute of the IAEA*, 1956, Art. IV; IAEA, *List of Member States*.

²⁴ World Nuclear Association, *Safeguards to Prevent Nuclear Proliferation*, 2016.

²⁵ Ibid.

²⁶ UN Conference on the Statute of the IAEA, *The Statute of the IAEA*, 1956, Art. III.

²⁷ *Treaty on the Non-Proliferation of Nuclear Weapons*, 1968.

The functions of the IAEA are described in Article 3 of the Statute, which consist of the assistance and surveillance of the peaceful use of atomic energy accomplished through the provision of research and technical assistance for the practical application and development atomic energy.²⁸ To that end, the IAEA makes provisions about the standards for materials, services, equipment, and facilities to conduct research and produce atomic power.²⁹ Furthermore, the IAEA encourages and assists in the exchange of information, training, and the exchange of scientists.³⁰ Additionally, the IAEA is able to acquire facilities, plants, and equipment necessary to conduct its tasks and responsibilities.³¹

Under its safeguard provisions in Article 7 of the Statute, the IAEA has the power to examine facilities and equipment, which includes the right to send inspectors to Member State facilities and to request progress reports from those states.³² Furthermore, the IAEA has the power to require information on health and safety standards, and on the production and recovery on fissionable materials.³³ In case of noncompliance with IAEA provisions, the Agency is able to take further sanctioning steps including the suspension or termination of IAEA assistance or the withdrawal of material and equipment provided by the Agency.³⁴

Additional functions of the IAEA are set out in Article 3 of the NPT, which obliges States parties to the treaty to accept safeguard provisions, which should be negotiated between the Member State and the IAEA in accordance with the provisions outlined in the Statute and the NPT.³⁵ The IAEA is responsible for supervising and ensuring compliance to the established safeguard provisions, including the prevention of the misuse of nuclear material for non-peaceful usage, such as nuclear weapons or other explosive nuclear devices, and the supervision of the production, procession, and usage of fissionable material.³⁶ Finally, the Statute establishes the IAEA's reporting to UN bodies, including annual reports to the General Assembly, reports to the Security Council as needed, and reports to other organs regarding matters within the "competence" of those bodies.³⁷

Recent Sessions and Current Priorities

Outcomes of the 62nd General Conference

The 62nd General Conference took place in September 2018, and was attended by more than 2,500 delegates from 153 IAEA Member States, international organizations, non-governmental organizations, and the media.³⁸ During the Conference, the Member States adopted a total of 13 resolutions on issues such as the further intensification of the IAEA's work on nuclear science and technology, safety, security, safeguards – including in the Middle East and DPRK, – and technical cooperation.³⁹ Other important decisions made at the 2018 General Conference were the amendment to Article XIV.A of the Agency's Statute permitting the establishment of biennial budgeting and the promotion of efficiency and effectiveness of the IAEA Decision Making Process.⁴⁰ At its upcoming 63rd session the IAEA's Director General is requested to present a report on the progress made towards the entry into force of this amendment.⁴¹ Simultaneously, the IAEA Scientific Forum took place discussing concrete proven solutions offered by nuclear technology to address climate change.⁴²

²⁸ UN Conference on the Statute of the IAEA, *The Statute of the IAEA*, 1956, Art. III A.

²⁹ Ibid.

³⁰ Ibid.

³¹ Ibid.

³² Ibid., Art. XII.

³³ Ibid.

³⁴ Ibid.

³⁵ *Treaty on the Non-Proliferation of Nuclear Weapons*, 1968.

³⁶ Ibid.

³⁷ UN Conference on the Statute of the IAEA, *The Statute of the IAEA*, 1956, Art. III.

³⁸ IAEA, GC62.

³⁹ IAEA, *62nd IAEA General Conference (2018) Resolutions and Other Decisions*.

⁴⁰ Ibid.; IAEA, *Amendment to Article XIV.A of the Statute*, 2018.

⁴¹ Ibid.

⁴² IAEA, *What Nuclear Technology Can Offer to Address Climate Change: Conclusions of the Scientific Forum*, 2018.

Upcoming 63rd General Conference

In September 2019, the 63rd General Conference will take place presenting the Annual Report 2018 and considering the topics: strengthening nuclear science and technology, safety, security, effectiveness of safeguards – including in the Middle East and the DPRK, – and technical cooperation.⁴³ The Arab Member States furthermore requested to include the agenda item "Israeli Nuclear Capabilities."⁴⁴ This year's Scientific Forum is titled "A Decade of Action on Cancer Control and the Way Forward" reviewing successes and challenges related to the setting up and delivery of nuclear and radiation medicine to fight the cancer burden as it was responsible for an estimated 9.6 million deaths in 2018.⁴⁵ In early September 2019, IAEA will also hold its first-ever international virtual conference on the topic of theranostics which is an emerging essential tool in the realm of cancer treatment.⁴⁶ Outside of the annual General Conference, the IAEA organizes a plethora of conferences, workshops, and seminar to build the capacity of its members and share knowledge with experts from all sectors, governmental, non-governmental, academic, and private, on a wide range of topics including nuclear education, food security, water management, climate change, emergency preparedness and response, health, and many more.⁴⁷

The 2020 NPT Review Conference

Every five years the NPT parties meet to review and reform the agreements within the treaty.⁴⁸ The most recent conference was held in 2015 and ended unsuccessfully with States parties unable to reach a consensus on the substance of the Final Document.⁴⁹ As several Review Conferences had limited success in recent decades, it is crucial that the States parties reach a consensus on the continuation and reform of the NPT and the future global nuclear order at the Review Conference in 2020.⁵⁰

Conclusion

The primary aim of the IAEA is to guarantee the peaceful use of nuclear material. Thereby, the Agency faces the challenge to advance nuclear technology and to spread knowledge on effective and sustainable usage of nuclear energy on one hand, and to prevent the usage of nuclear material for atomic weapons and non-peaceful purposes on the other hand.⁵¹ The work of the IAEA is crucial to the development of nuclear security standards that allow for the development of peaceful uses of nuclear technologies to guarantee the protection of human health and the environment.⁵² Several key challenges undermine the ability of the Agency to enforce these standards, including the situations in North Korea and the Middle East. As the IAEA continues its work toward the realization of the SDGs through its day-to-day operations, implementation of the PUI, and preparation for the 2020 NPT Review Conference, great focus will be on addressing current security challenges facing the Agency.

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Fischer, D. (1997). *History of the International Atomic Energy Agency: The first Forty Years*. Retrieved 19 July 2016 from: http://www-pub.iaea.org/MTCD/publications/PDF/Pub1032_web.pdf

This publication covers the first 40 years of the IAEA's history and describes the foundation and developments of the Agency during that period. The publication particularly concentrates on the foundation of the Agency and the difficulties the IAEA

⁴³ IAEA, GC63.

⁴⁴ IAEA, *Communication received from the Resident Representative of Israel regarding the request to include in the agenda of the Conference an item entitled "Israeli Nuclear Capabilities" (GC(63)/17)*, 2018.

⁴⁵ IAEA, GC63; IAEA, *A Decade of Action on Cancer Control and the Way Forward*, 2019.

⁴⁶ IAEA, *Focusing on Theranostics: IAEA to Hold its First Virtual International Conference*, 2019.

⁴⁷ IAEA, *News*, 2019.

⁴⁸ IAEA, *NPT Review Conferences*; UN, *Conference to the Parties of the NPT, 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)*.

⁴⁹ IAEA, *NPT Review Conferences*; UN, *Conference to the Parties of the NPT, 2015 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons (NPT)*.

⁵⁰ Meyer, *A failed nuclear NPT review conference: Fin de regime?*, 2015; Baklitskiy, *The 2015 NPT Review Conference and the Future of the Nonproliferation Regime*, 2015.

⁵¹ IAEA, *Annual Report 2018 (GC(63)/5)*, 2019.

⁵² IAEA, *The IAEA Mission Statement*.

faced during the period of the Cold War. The publication provides an in-depth and comprehensive oversight of the challenges and achievements of the Agency during the first 40 years after its creation. Even though the publication is quite old and lacks the development of the last 20 years, it is a helpful and rich source to learn about the first years of the Agency and the challenges during the Cold War and post-Cold War period.

International Atomic Energy Agency. (2019). *Annual Report 2018 (GC(63)/5)*. Retrieved 31 July 2019 from: <https://www.iaea.org/sites/default/files/gc/gc63-5.pdf>

The report is the newest publication of the IAEA's annual report about its work and achievements of the period of 2018. The report provides an overview of the various areas of engagement of the IAEA, including nuclear technology, nuclear safety and security, nuclear verification, and technical cooperation. Thereby, the report particularly concentrates on nuclear technologies and also assesses areas that are related to nuclear energy and technology, such as, but not limited to, food and agriculture, environment, water resources, and human health. The report is a good way for delegates to receive an overview of the Agency's areas of action and the achievements reached in different areas of nuclear energy.

Treaty on the Non-Proliferation of Nuclear Weapons (1968). Retrieved 12 August 2016 from: <https://www.iaea.org/sites/default/files/publications/documents/infcircs/1970/infcirc140.pdf>

The Treaty on the Non-Proliferation of Nuclear Weapons is one of the most important treaties leading and defining the IAEA's responsibilities, mandate, and powers. The Treaty depicts a major achievement of the Agency and significantly advanced the combat against the spread of nuclear weapons. The Treaty provides delegates with the necessary knowledge on the current legal situation on the proliferation of nuclear weapons and shows possible gaps and necessary improvements that delegates should discuss and negotiate on.

United Nations, Conference on the Statute of the International Atomic Energy Agency. (1956). *The Statute of the International Atomic Energy Agency*. Retrieved 19 July 2016 from: <https://www.iaea.org/sites/default/files/statute.pdf>

The Statute is the founding document of the IAEA that outlines and describes the terms and conditions of the establishment and the functioning of the Agency. The Statute includes objectives, functions, rules for memberships, and further regulations concerning the structure and the work of the IAEA. The Statute is the ideal source to get familiar with the Agency's mandate, responsibilities and functions, powers and possibilities. This source is a good starting point for the research of delegates and provides a basis for the knowledge necessary to continue research on the substantive work and actions of the Agency.

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Forum [News Article]. Retrieved 31 July 2019 from: <https://www.iaea.org/newscenter/news/what-nuclear-technology-can-offer-to-address-climate-change-conclusions-of-the-scientific-forum>

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I. Strengthening Safeguards and Verification

Introduction

Because of its high energy potential, nuclear technologies can provide necessary tools for Member States for more sustainable development.⁵³ Compared to 2016 levels, the International Atomic Energy Agency's (IAEA) 2017 projections for global installed nuclear power capacity showed an increase of 42% by 2030, and up to 123% by 2050 in the high case scenario.⁵⁴ While this energy can be used to generate electricity for developing cities, it can also be used for non-peaceful purposes.⁵⁵ Preventing the proliferation of nuclear weapons and illicit nuclear technology is one of the highest priorities of the international community and the IAEA's main objective is to ensure the peaceful use of atomic energy and its contribution to health and prosperity worldwide.⁵⁶ The global Nuclear Non-Proliferation Treaty (NPT) is an example of several landmark agreements that frame global efforts against the spread of nuclear weapons and that entrusts the IAEA as the nuclear inspectorate.⁵⁷ The IAEA plays thereby a critical role in preventing the production and proliferation of nuclear weapons with its safeguards and verification mechanisms.⁵⁸ A safeguards regime aims to detect the diversion of nuclear material to construct nuclear weapons and includes measures by which the IAEA can verify that a Member State is living up to its international commitments of using nuclear programs appropriately.⁵⁹ In opposition to natural or depleted uranium, radioactive substances not containing nuclear materials are not subject to the IAEA's safeguards nor do they need to be reported under a safeguard agreement.⁶⁰ The IAEA's safeguards are set in binding agreements between the agency and Member States, and form the framework for the IAEA to execute effective verification.⁶¹ Today, the IAEA safeguards nuclear material and activities under agreements with more than 180 Member States.⁶²

Thanks to safeguard agreements, the IAEA is able to provide assurances to the international community that Member States are honoring their obligations and only develop nuclear technology and material for peaceful purposes.⁶³ However, safeguards have only worked adequately for declared nuclear material, while the safeguard regime is not equipped to detect undeclared nuclear material or activities.⁶⁴ In addition, continuously advancing technologies are a major challenge for the efficiency of the safeguards and it is vital to continue improving safeguards and verification mechanisms.⁶⁵

International and Regional Framework

The rapid increase of nuclear material production in the 1960s and the ongoing race for nuclear weapons at that time concerned Member States about its impact on global security.⁶⁶ Consequently, the United Nations (UN) General Assembly requested the Eighteen-Nation Committee on Disarmament to conduct negotiations between Member States for a global treaty that would prevent the spread of nuclear weapons.⁶⁷ In 1968, the UN General Assembly commended the resulting draft as the NPT and the framework entered into force in 1970.⁶⁸ It obligates States Parties to take steps toward disarmament and

⁵³ IAEA, *IAEA Annual Report 2017*, 2018.

⁵⁴ Ibid.

⁵⁵ Ibid.

⁵⁶ IAEA, *Meeting Safeguards Challenges*, 2013; IAEA, *The Statute of the IAEA*.

⁵⁷ IAEA, *IAEA Annual Report 2017*, 2018.

⁵⁸ IAEA, *IAEA Safeguards Overview: Comprehensive Safeguards Agreements and Additional Protocols*.

⁵⁹ IAEA, *IAEA Safeguards: Staying Ahead of the Game*, 2007.

⁶⁰ Ibid.

⁶¹ IAEA, *IAEA Safeguards Serving Nuclear Non-Proliferation*, 2015.

⁶² IAEA, *IAEA Safeguards Overview: Comprehensive Safeguards Agreements and Additional Protocols*.

⁶³ IAEA, *IAEA Safeguards Serving Nuclear Non-Proliferation*, 2015.

⁶⁴ IAEA, *IAEA Safeguards: Staying Ahead of the Game*, 2007.

⁶⁵ Ibid.

⁶⁶ IAEA, *IAEA Safeguards Serving Nuclear Non-Proliferation*, 2015.

⁶⁷ UN General Assembly, *Question of Disarmament (A/RES/1722(XVI))*, 1961.

⁶⁸ IAEA, *Treaty of the Non-Proliferation of Nuclear Weapons and the IAEA – A Chronology*.

to utilize nuclear technology peacefully.⁶⁹ A total of 188 countries are States Parties to the NPT.⁷⁰ Under Article III of the NPT, non-nuclear-weapon states (NNWSs) that wish to develop nuclear programs are mandated to sign a safeguards agreement with the IAEA.⁷¹ This allows the IAEA to verify that the NNWS is not manufacturing or developing nuclear weapon material or technology.⁷²

These obligations to non-proliferation and safeguards are also part of regional treaties and are required in nuclear-weapon-free-zones (NWFZs).⁷³ The 1967 regional *Treaty for the Prohibition of Nuclear Weapons in Latin America and the Caribbean* was the first international treaty that required all of its States Parties to conclude safeguards agreements with the IAEA.⁷⁴ Similar regional agreements followed, including the 1985 Treaty of Rarotonga, the 1995 Treaty of Bangkok, and the 1996 Treaty of Pelindaba.⁷⁵ The last one established the African NWFZ that covers nearly all of the African continent.⁷⁶ NWFZs prohibit all States Parties from receiving, storing, installing, deploying, or possessing any forms of nuclear weapons or nuclear explosive devices.⁷⁷

Three types of safeguards agreements frame the IAEA's efforts to verify the proper use of nuclear material: the comprehensive safeguards agreements (CSAs), the item-specific safeguard agreements, and the voluntary offer agreements (VOAs).⁷⁸ CSAs require that a Member State accepts the IAEA's safeguards on all of the nuclear material in its territory or under its jurisdiction.⁷⁹ Under these agreements the IAEA verifies that no nuclear material is used to construct nuclear weapons or nuclear explosive devices.⁸⁰ Any Member State that is part of a NWFZ or a signatory of the NPT needs to establish a CSA with the IAEA.⁸¹ There are currently only very few countries that do not have a CSA with the IAEA.⁸² On another hand, item-specific safeguards agreements only address nuclear material, facilities, and other items specified in the agreement, while excluding all other materials not mentioned in the agreement.⁸³ Finally, VOAs are agreements between the five NPT nuclear-weapon states (NWSs), namely the United States, United Kingdom, France, China, and Russia, and the IAEA, in which facilities and material are offered for the application of safeguards on a voluntary basis.⁸⁴

The IAEA also offers two types of protocols to strengthen safeguard agreements: small quantities protocols (SQPs) and additional protocols (APs).⁸⁵ SQPs are used to minimize the expenditures and bureaucracy for NNWSs with CSAs that have very minimal nuclear activities.⁸⁶ APs allow the IAEA an increased physical access to facilities, material, and information and strengthen administrative arrangements, such as cooperation on the Peaceful Uses of Nuclear Energy between two Member States.⁸⁷ APs are used to fill in the gaps of information.⁸⁸ Any Member State with a safeguards agreement with the IAEA can conclude an AP.⁸⁹ Once a Member State has a CSA as well as an AP in place, the

⁶⁹ IAEA, *IAEA Safeguards: Staying Ahead of the Game*, 2007.

⁷⁰ IAEA, *IAEA Annual Report 2017*, 2018.

⁷¹ IAEA, *IAEA Safeguards Serving Nuclear Non-Proliferation*, 2015.

⁷² IAEA, *IAEA Safeguards: Staying Ahead of the Game*, 2007.

⁷³ *Ibid.*

⁷⁴ *Ibid.*

⁷⁵ *Ibid.*

⁷⁶ IAEA, *Nuclear-Weapon-Free-Zones*.

⁷⁷ *Ibid.*

⁷⁸ IAEA, *IAEA Safeguards Serving Nuclear Non-Proliferation*, 2015.

⁷⁹ *Ibid.*

⁸⁰ *Ibid.*

⁸¹ *Ibid.*

⁸² IAEA, *Conclusion of safeguards agreements, additional protocols and small quantities protocols*, 2019.

⁸³ IAEA, *IAEA Safeguards Serving Nuclear Non-Proliferation*, 2015.

⁸⁴ *Ibid.*

⁸⁵ *Ibid.*

⁸⁶ *Ibid.*

⁸⁷ *Ibid.*

⁸⁸ IAEA, *IAEA Safeguards: Staying Ahead of the Game*, 2007.

⁸⁹ IAEA, *IAEA Safeguards Serving Nuclear Non-Proliferation*, 2015.

IAEA is able to ensure fully that the Member State's nuclear activities remain peaceful.⁹⁰ Currently, 132 countries have an AP in place and another 20 have signed but not yet ratified an AP.⁹¹

An example for the international community's efforts to ensure the peaceful use of nuclear technology in the 2015 Security Council resolution 2231 (2015) unanimously adopted endorsing the Joint Comprehensive Plan of Action (JCPOA).⁹² The JCPOA outlines an inspection process and schedule monitoring Iran's nuclear activities.⁹³ The Security Council affirmed that full implementation of the JCPOA would contribute to building confidence in the exclusively peaceful nature of Iran's nuclear program and emphasized that the JCPOA is conducive to promoting and facilitating the development of normal economic and trade contacts and cooperation with Iran.⁹⁴

In light of nuclear technology's potential for sustainable development, the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs) adopted by the UN General Assembly in 2015 frames the usage of nuclear technology.⁹⁵ The IAEA, in line with its 'Atoms for Peace and Development' mandate, supports countries in their efforts to reach the 17 SDGs set out in the 2030 Agenda.⁹⁶ Many countries use nuclear science and technology to contribute to and meet their development objectives in areas including energy, human health, food production, water management, and environmental protection.⁹⁷ The use of these technologies contributes directly to nine of the 17 SDGs.⁹⁸ Especially SDGs 7 (affordable and clean energy), 9 (industry, innovation, and infrastructure), and 16 (peace, justice, and strong institutions) are heavily influenced by the agreements and safeguard regimes between the IAEA and Member States.⁹⁹

Role of the International System

The IAEA's safeguards are implemented through many different ways.¹⁰⁰ These include processing information and collected material and environmental samples by the IAEA's inspectors, reviewing, and validating information.¹⁰¹ The analysis of nuclear material samples and environmental samples taken by the IAEA's inspectors is an essential component of this undertaking.¹⁰² In close cooperation between Member States and the IAEA, programs like the Global Nuclear Safety and Security Network (GNSSN), launched in 2006, or the International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO), established in 2000, were introduced.¹⁰³ The GNSSN is a network and a platform, allowing its members to share nuclear safety and security knowledge to achieve the worldwide implementation of high-level IAEA nuclear safety and security standards.¹⁰⁴ INPRO is a project that supports members in their long-term planning and collaboration on innovations in reactors, fuel cycles, and institutional approaches that will promote sustainable development of nuclear energy.¹⁰⁵

⁹⁰ IAEA, *IAEA Annual Report 2017*, 2018.

⁹¹ IAEA, *IAEA Safeguards Serving Nuclear Non-Proliferation*, 2015.

⁹² UN Security Council, *Non-Proliferation (S/RES/2231(2015))*, 2015; IAEA, *Joint Comprehensive Plan of Action implementation and verification and monitoring in the Islamic Republic of Iran in light of United Nations Security Council Resolution 2231 (2015) (GOV/2015/71)*, 2015.

⁹³ Ibid.

⁹⁴ Ibid.

⁹⁵ UN General Assembly, *Transforming our world: the 2030 Agenda for Sustainable Development (A/RES/70/1)*, 2015.

⁹⁶ IAEA, *Sustainable Development Goals (SDGs)*.

⁹⁷ Ibid.

⁹⁸ Ibid.

⁹⁹ Ibid.

¹⁰⁰ IAEA, *IAEA Safeguards Serving Nuclear Non-Proliferation*, 2015.

¹⁰¹ Ibid.

¹⁰² Ibid.

¹⁰³ IAEA, *International Project on Innovative Nuclear Reactors and Fuel Cycles*.

¹⁰⁴ IAEA, *Global Nuclear Safety and Security Network*.

¹⁰⁵ IAEA, *International Project on Innovative Nuclear Reactors and Fuel Cycles*.

The IAEA also cooperates with regional organizations, such as the European Union (EU), to strengthen safeguards standards.¹⁰⁶ During a meeting in 2017, the IAEA and EU exchanged views on enhancing nuclear security, safeguards techniques, and nuclear science applications.¹⁰⁷ The EU also played a key role in the negotiation and implementation of the 2016 JCPOA, the nuclear safeguards agreement between the IAEA and Iran.¹⁰⁸ The EU has agreed to cooperate with Iran in areas of nuclear safety and will be providing technical support to the IAEA, including training and equipment.¹⁰⁹

The UN General Assembly also collaborates with subsidiary bodies such as the Disarmament and International Security Committee and the UN Disarmament Commission, which both aim to submit concrete recommendations on nuclear disarmament issues to the UN General Assembly and Security Council.¹¹⁰ Furthermore, the IAEA Statute includes a relationship agreement with the UN General Assembly which requires the IAEA to submit an annual report to the UN General Assembly, to provide the body with an overview of the current global nuclear safety situation.¹¹¹

Modernization of Safeguards

One challenge posed to the safeguards regime is that the amount of nuclear material and the number of nuclear facilities subject to the IAEA's safeguards inspections is steadily growing.¹¹² The use of nuclear power continues to expand rapidly, causing additional stresses, especially related to technology and workforce limitations, on the efficiency of the IAEA's safeguards regime.¹¹³ The IAEA estimates that the number of nuclear facilities under safeguards has risen by 12% between 2010 and 2015 and that the quantity of nuclear material under safeguards inspection has grown by 14%.¹¹⁴ This rise of nuclear facilities under safeguards is also resulting in similar increases in the number of CSAs and APs signed between Member States and the IAEA.¹¹⁵ In addition, international nuclear research and development as well as trade in nuclear materials are at record highs, underlining the importance of adequately controlling and regulating nuclear material traffic.¹¹⁶ Cooperation among and with Member States and regional actors is still insufficient to guarantee quick and effective implementation of the IAEA's safeguards.¹¹⁷ Beside this, cooperation could enable other actions such as export/import controls, radiation protection, and nuclear safety and security.¹¹⁸

The IAEA highlights the need for further improving and optimizing the efficiency of the agency's work to be able to respond to new issues arising, specifically in the areas of cooperation and adherence to the implementation of safeguard agreements.¹¹⁹ Another impediment is the lack of connectivity between IAEA institutions and facilities worldwide to establish a more efficient and streamlined network and operations.¹²⁰ Currently inspectors do not have access to a number of resources or information unless they are on site slowing down processes and further straining personnel resources.¹²¹ The IAEA has also recognized that it needs to better leverage the use of emerging technologies such as safeguards analytics laboratories, enhanced surveillance systems, in addition to other modern information technologies (IT).¹²² Therefore, the IAEA launched the Modernization of Safeguards Information

¹⁰⁶ IAEA, *IAEA and EU Strengthen Cooperation in Nuclear Activities*, 2017.

¹⁰⁷ Ibid.

¹⁰⁸ Ibid.

¹⁰⁹ Ibid.

¹¹⁰ Nuclear Threat Initiative, *United Nations General Assembly*, 2018.

¹¹¹ Ibid.

¹¹² IAEA, *Safeguards in Practice*, 2015.

¹¹³ IAEA, *IAEA Safeguards Serving Nuclear Non-Proliferation*, 2015.

¹¹⁴ Ibid.

¹¹⁵ IAEA, *IAEA Annual Report 2017*, 2018.

¹¹⁶ IAEA, *IAEA Safeguards Serving Nuclear Non-Proliferation*, 2015.

¹¹⁷ Ibid.

¹¹⁸ Ibid.

¹¹⁹ IAEA, *Safeguards in Practice*, 2015.

¹²⁰ Ibid.

¹²¹ Ibid.

¹²² IAEA, *Enhancing Effective Nuclear Verification: Upgrading IAEA Safeguards Capabilities*, 2015.

Technology (MOSAIC) program from 2015 until 2018 administrated by the Department of Safeguards.¹²³ Developing modern and standard procedures that streamline the work, was one of the main goals of MOSAIC.¹²⁴ In addition, the program aimed to establish a modernized IT system that will allow it to perform safeguards implementation processes more efficiently, effectively, and securely.¹²⁵ The foreseen benefits will allow the IAEA to be more productive, in terms of fulfilling the rising demand for its services.¹²⁶ MOSAIC has also influenced the way that the agency approaches the development of its IT solutions.¹²⁷ While prior to MOSAIC there were disconnected work flows causing delays, MOSAIC was directly focusing on the needs of the users, and has delivered tools based on their exact specifications.¹²⁸ MOSAIC finished in 2018 though the modernization of the IAEA is not yet finished and resource and funding gaps persist.¹²⁹

Verification and Monitoring

Over the past decade, the IAEA's safeguards and verification measures have been strengthened in many core areas including confidence building applications and the detection of clandestine nuclear weapons programs.¹³⁰ Ensuring the efficiency of monitoring Member States by the IAEA is especially important to achieve confidence building.¹³¹ The Conference on Disarmament proposed a Fissile Material Cut-Off Treaty (FMCT), in 1995, which if enacted, would prohibit Member States from acquiring or producing fissile material needed for nuclear weapons or nuclear explosive devices but has since been opposed by several Member States.¹³² A FMCT would primarily limit the nuclear weapon activities of the five NWSs and the four countries outside of the NPT, namely India, Israel, Pakistan, and North Korea.¹³³ Verification capabilities have also been strengthened recently through the modernization of the IAEA's safeguards analytical laboratories soft- and hardware.¹³⁴ However, safeguards and verification mechanisms will likely continue to evolve as more challenges arise, like new technologies are created and new fields of use are gained for nuclear material.¹³⁵ So it is vital to the IAEA that it continues to optimize its work and ensure a constant and adequate flow of funding.¹³⁶

Conclusion

The IAEA verifies and safeguards nuclear material and technology with the support of its Member States, thereby preventing the proliferation of nuclear weapons.¹³⁷ However, nuclear energy and technology continue to progress rapidly, which is creating challenges for the implementation of the IAEA's safeguards and verification mechanisms.¹³⁸ The non-disclosure of nuclear material and facilities continues to threaten international peace and security, making the strengthening of the safeguards regime a top priority.¹³⁹ The implementation of the IAEA's safeguards and verification mechanisms depends on the support and the commitment of Member States.¹⁴⁰ Finally, the IAEA needs to continuously look for innovative ways of improving the efficiency and effectiveness of safeguards and verification mechanisms in order to keep up with technological advancement and the scale of nuclear technology being used.

¹²³ IAEA, *The Modernization of Safeguards Information Technology: Completing the picture*, 2016.

¹²⁴ Ibid.

¹²⁵ Ibid.

¹²⁶ Ibid.

¹²⁷ Ibid.

¹²⁸ Ibid.

¹²⁹ Ibid.

¹³⁰ IAEA, *IAEA Safeguards Overview: Comprehensive Safeguards Agreements and Additional Protocols*, 2019.

¹³¹ Ibid.

¹³² Nuclear Threat Initiative, *Proposed Fissile Material (Cut-Off) Treaty (FMCT)*, 2018.

¹³³ Ibid.

¹³⁴ IAEA, *IAEA Safeguards Serving Nuclear Non-Proliferation*, 2015.

¹³⁵ IAEA, *Safeguards in Practice*, 2015.

¹³⁶ Ibid.

¹³⁷ Ibid.

¹³⁸ IAEA, *IAEA Safeguards Serving Nuclear Non-Proliferation*, 2015.

¹³⁹ Ibid.

¹⁴⁰ Ibid.

Further Research

During their research, delegates may consider addressing these questions: How can the IAEA, in a constantly transforming world, ensure to stay up to date? Are there still monitoring measures if a Member State retreats from all agreements with the IAEA? How can the IAEA help to overcome mistrust between Member States and strengthen monitoring and verification measures? How can funding be assured for future modernization? What are other modernizations possible beside information technologies?

Annotated Bibliography

International Atomic Energy Agency. (2007). *IAEA Safeguards: Staying Ahead of the Game* [Report]. Retrieved 18 June 2019 from: <https://www.iaea.org/sites/default/files/safeguards0707.pdf>

This IAEA report gives an overview and historical background on IAEA safeguards and verification mechanisms. Although from 2007, this report remains valuable as it details the evolution of IAEA safeguards and their place within the non-proliferation regime. This report also details the founding of the NPT and explains how it remains a balance of rights and obligations with regard to nuclear disarmament and non-proliferation. This review also details the in-field verification measures undertaken as part of a CSA and measures that were utilized to strengthen the safeguard system between 1991 and 2005.

International Atomic Energy Agency. (2015). *IAEA Safeguards Serving Nuclear Non-Proliferation* [Report]. Retrieved 18 June 2019 from: https://www.iaea.org/sites/default/files/safeguards_web_june_2015_1.pdf

This IAEA report gives a thorough introduction to the IAEA safeguards framework. This report details how IAEA safeguards are an essential pillar of the nuclear non-proliferation regime, ensuring that the IAEA is able to provide assurances that Member States are honoring their international obligations to only seek nuclear material for peaceful purposes. This is an important document for delegates to consider as they are completing their research because it provides an overview of the way in which IAEA safeguards have been strengthened in recent years.

International Atomic Energy Agency. (2015). *Safeguards in Practice* [Website]. Retrieved 18 June 2019 from: <https://www.iaea.org/topics/safeguards-in-practice>

The IAEA website provides a very useful summary of key facts and figures relating to IAEA safeguards and verification mechanisms for 2015. This source is significant for delegates to review because it provides relevant statistics relating to the number of safeguards agreements and additional protocols currently being applied. This source also provides figures relating to the significant quantities of nuclear material, the number of in-field inspections, and the amount of nuclear material reported on for 2015.

International Atomic Energy Agency. (2016). *The Modernization of Safeguards Information Technology: Completing the picture* [Report]. Retrieved 18 June 2019 from: <https://www.iaea.org/sites/default/files/17/01/mosaic.pdf>

The document from 2016 summarizes all achievements the IAEA has reached on its way to modernization. It also mentions all projects that are finished by now. It also sums up all projects related to the three-year plan. Knowing what was achieved during the plan is essential to being able to understand? The modernization of Safeguards Information Technology.

International Atomic Energy Agency. (2018). *IAEA Annual Report 2017*. Retrieved 18 June 2019 from: <https://www.iaea.org/sites/default/files/publications/reports/2017/gc62-3.pdf>

This IAEA annual report gives an overview of IAEA activities for 2017 and is the most recent annual report that has been published. The report details nuclear technology activities, nuclear safety and security activities, nuclear verification activities, and technical cooperation with States. The section on nuclear verification is especially significant for delegates to consider as it provides a discussion of the implementation of safeguards in 2017. This report also discusses measures

for enhancing safeguards including implementation measures, cooperation with states and regional authorities, and safeguards equipment and tools.

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II. Using Nuclear Technology to Achieve the Sustainable Development Goals

Introduction

In addition of being a clean energy source to supply electricity, nuclear technology (NT) includes a wide variety of derived techniques that play an important role for global sustainable development.¹⁴¹ Nuclear derived products and techniques are also used in other domains, such as food security and environmental protection.¹⁴² For example, radioisotopes are forms of an element that are unstable due to an excess of energy emitting radiation.¹⁴³ Although they can be found naturally, they are mostly produced in nuclear research reactors and are widely used in medicine for diagnostic and treatments, improving life quality.¹⁴⁴ Additionally, climate change induces extreme temperature fluctuations and reduces crops development and yields.¹⁴⁵ Because irradiation accelerates the natural process of mutation in plants, it allows the selection of desired traits to survive new environmental challenges.¹⁴⁶ Such NTs have led to a series of climate-proof crops, including a new drought tolerant rice variety, now being used in Cuba, which has increased crop yields by 10%.¹⁴⁷ In line with the adoption of the *2030 Agenda for Sustainable Development* in 2015, NT can therefore strongly contribute to the achievement of the Sustainable Development Goals (SDGs).¹⁴⁸ Overall, NTs are directly contributing to nine of the 17 SDGs, including the eradication of hunger (SDG 2) and the improvement of water and sanitation quality (SDG 6).¹⁴⁹

Since its establishment in 1957, the mandate of the International Atomic Energy Agency (IAEA) is to expand the contribution of NT for global peace, health, and prosperity.¹⁵⁰ To do so, the IAEA supports Member States (MS) in the implementation of NT by carrying out research, fostering scientific knowledge, and sharing technology.¹⁵¹ By doing so, the IAEA aims to facilitate access for MS to NT and to strengthen the development of nuclear science, technology, and applications.¹⁵² Realizing the potential of NTs, a growing number of MS are requesting support from the IAEA to provide knowledge and resources in the integration of nuclear technologies in their national plans to achieve the SDGs.¹⁵³ Nevertheless, the adoption of these technologies requires well-trained human resources.¹⁵⁴ Less developed MS particularly struggle to achieve the SDGs and are affected by insufficient knowledge and technology capacity in addition to lack of training opportunities.¹⁵⁵ Furthermore, the use of these NTs can be costly and several interested MS face resource scarcity to adopt NTs and maintain their usage, including lack of funding and infrastructure.¹⁵⁶

International and Regional Framework

The *Treaty on the Non-Proliferation of Nuclear Weapons* (NPT), which entered into force in 1970, is an international agreement ratified by 191 MS that has become a key document for the right of access and the peaceful use of NT for all State parties.¹⁵⁷ While the NPT primarily aims at preventing the use and

¹⁴¹ IAEA, *Sustainable Development Goals*.

¹⁴² IAEA, *Radioisotope production in research reactors*.

¹⁴³ *Ibid.*

¹⁴⁴ *Ibid.*

¹⁴⁵ IAEA, *Mutation induction*.

¹⁴⁶ IAEA, *Scientists Develop New 'Climate Proof' Crops with Help of Nuclear Technology*, 2018.

¹⁴⁷ *Ibid.*

¹⁴⁸ IAEA, *How the IAEA Will Contribute to the Sustainable Development Goals*, 2015.

¹⁴⁹ *Ibid.*

¹⁵⁰ UN Conference on the Statute of the IAEA, *The Statute of the IAEA*, 1956.

¹⁵¹ IAEA, *The Revised Guiding Principles and General Operating Rules to Govern the Provision of Technical Assistance by the Agency*, 1979.

¹⁵² IAEA, *Overview*.

¹⁵³ IAEA, *Strengthening the Agency's activities related to nuclear, science, technology and applications (GC(62)/RES/9)*, 2018.

¹⁵⁴ IAEA, *Nuclear knowledge management*.

¹⁵⁵ International Young Naturefriends, *Sustainable Development and its Challenges in Developing Countries*, 2018.

¹⁵⁶ IAEA, *Newcomer countries face common challenges in nuclear infrastructure development*, 2016.

¹⁵⁷ UN, *Treaty on the Non-Proliferation of Nuclear Weapons (NPT)*.

spread of nuclear weapons, the treaty also underlines the right of all MS to use NT for peaceful purposes.¹⁵⁸ It further highlights the importance of exchanging knowledge and technologies between MS and invites them to consider the needs of the least developed regions.¹⁵⁹

The 1972 United Nations (UN) Conference on Human Environment paved the way in identifying science and technology as key for the protection and the improvement of the human environment.¹⁶⁰ To fulfill this vision, the Conference called on appropriate agencies and bodies of the UN, such as the IAEA, to develop the science and technology capacity of MS, particularly least developed and developing countries.¹⁶¹ In light of that Conference, the IAEA established in 1979 the Guiding Principles and General Operating Rules to Govern the Provision of Technical Assistance by the Agency.¹⁶² The document established that technical assistance provided by the IAEA to MS for the implementation of NTs constitutes a major priority and underlined that resources should be especially allocated to developing MS.¹⁶³ These resources may take forms of, but are not limited to, experts and scientific visits, training opportunities, infrastructure, and materials.¹⁶⁴

With the assistance of the IAEA, also regional frameworks were established to support the contribution of nuclear science and technology to sustainable development in specific regions.¹⁶⁵ These regional frameworks ensure joint efforts among MS through programs and projects to address shared needs and priorities.¹⁶⁶ The African Regional Cooperative Agreement for Research, Development and Training related to Nuclear Science and Technology (AFRA) is an example of a regional framework and was adopted by the Board of Governors of the IAEA in 1990.¹⁶⁷ The AFRA led for instance to the establishment of a committee of representatives from African MS to define priorities and approve cooperative projects submitted to the committee by its members.¹⁶⁸

In 2015, the UN General Assembly adopted the 2030 Agenda, a new plan of actions with 17 SDGs to replace the eight UN Millennium Development Goals and to lead global efforts toward solving global issues.¹⁶⁹ The 2030 Agenda includes 169 targets grouped in the 17 ambitious SDGs and balances the economic, social, and environmental dimensions of sustainable development.¹⁷⁰ As mentioned above, MS can use NTs to directly meet nine of these 17 SDGs: to end hunger (SDG 2); to ensure healthy lives (SDG 3); to provide quality water and clean sanitation (SDG 6); to deliver access to sustainable energy for all (SDG 7); to build resilient infrastructure and foster innovation (SDG 9); to combat climate change (SDG 13); to preserve life on land and below water (SDGs 14 and 15); and to develop global partnerships for the achievement of the SDGs (SDG 17).¹⁷¹ Furthermore, because of the inter-connected nature of the SDGs, NTs may indirectly contribute to the achievement of the other SDGs.¹⁷² For instance, the use of isotopes can ensure a sustainable management of quality water (SDG 6) indirectly contributing to fighting poverty and people's resilience (SDG 1) and more sustainable consumption patterns (SDG 12).¹⁷³ The 2030 Agenda underlines partnerships between all stakeholders as crucial means to develop and apply

¹⁵⁸ UN General Assembly, *Treaty on the Non-Proliferation of Nuclear Weapons (A/RES/2373 (XXII))*, 1968.

¹⁵⁹ Ibid.

¹⁶⁰ UNEP, *Report of the United Nations Conference on Human Environment (A/CONF.48/14/REV.1)*, 1972.

¹⁶¹ Ibid.

¹⁶² IAEA, *The Revised Guiding Principles and General Operating Rules to Govern the Provision of Technical Assistance by the Agency*, 1979.

¹⁶³ Ibid.

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¹⁶⁵ IAEA, *Regional/Cooperative Agreements*.

¹⁶⁶ Ibid.

¹⁶⁷ IAEA, *The Text of an African Regional Co-Operative Agreement for Research, Development and Training Related to Nuclear Science and Technology (INFCIRC/377)*, 1990.

¹⁶⁸ Ibid.

¹⁶⁹ UN General Assembly, *Transforming our world: the 2030 Agenda for Sustainable Development (A/RES/70/1)*, 2015.

¹⁷⁰ Ibid.

¹⁷¹ IAEA, *How the IAEA Will Contribute to the Sustainable Development Goals*, 2015.

¹⁷² IAEA, *Argentina Applies Nuclear Technology to Water*, 2018.

¹⁷³ UN DESA, *Interlinked nature of the Sustainable Development Goals*, 2018.

knowledge and technology as enablers for global sustainable development.¹⁷⁴ Such partnerships can enhance the dissemination of the IAEA's effort to promote benefits of NTs and offer a more cost-efficient implementation of these NTs.¹⁷⁵

Role of the International System

The IAEA is a unique multidisciplinary agency with a high priority on expanding MS' science and technology capacity in the field of NTs and providing technical assistance to them.¹⁷⁶ To do so, the agency has established several tools and programs that promote partnerships between the IAEA and MS, including the Country Programme Frameworks (CPFs), the Technical Cooperation Programme (TCP) and Technical Cooperation Fund (TCF), and the Coordinated Research Projects (CRPs).¹⁷⁷ The CPF reflects a MS' development priorities for the upcoming four to six years and takes into consideration how to achieve the SDGs through transferring nuclear science and technology to MS, assisting them to establish, maintain, and strengthen national capacities to effectively use NT for development.¹⁷⁸ During the process, both parties agree on needs requiring technical cooperation with the IAEA and determine the specific means of assistance.¹⁷⁹ Being prepared by the government in close dialogue with the IAEA, the CPFs ensure the sustainable impact of IAEA's support to MS in achieving the SDGs.¹⁸⁰

Two primary mechanisms used by the IAEA to transfer NT to MS, helping them to address the SDGs, are the TCP and the TCF.¹⁸¹ In June 2019, the IAEA was assisting MS, mostly in developing regions, on 1,614 national and regional technical cooperation projects, twice the amount of projects then at the end of 2017.¹⁸² The TCP is primarily funded by the TCF, a fund collecting voluntary contributions from MS.¹⁸³ Of the €105.6 million used in 2017 for the TCP, more than €83 million originated from the TCF.¹⁸⁴ Forms of assistance provided through the program include technology and resources transfers, education and training opportunities, and guidance in program management, safety regulations, and policymaking.¹⁸⁵ For instance, animal diseases that kill livestock are a major threat to the socio-economic development of rural families in Malawi.¹⁸⁶ In 2012, Malawi requested help from the IAEA through the TCP to improve the diagnosis and the management of these destructive animal diseases.¹⁸⁷ The IAEA conducted courses in molecular diagnostics for 25 veterinary staff and collaborated to make the necessary infrastructure upgrades, such as the acquisition of new reagents and chemicals.¹⁸⁸ The assistance of the IAEA led to a reduction in the time to diagnose diseases from two months to a few days and greatly contributed to Malawi's efforts to achieve SDG 2 on ending hunger.¹⁸⁹ The IAEA is also involved in enhancing the role of NT for the achievement of the SDGs through the CRPs, which support research by joining research institutes sharing common interest in developing and developed MS.¹⁹⁰ The IAEA coordinates the projects and results are available, free of charge, to the scientific community in all MS.¹⁹¹ In the early 2000s, HIV-infected mothers were recommended to stop breastfeeding by health workers, which led to a

¹⁷⁴ UN General Assembly, *Transforming our world: the 2030 Agenda for Sustainable Development (A/RES/70/1)*, 2015.

¹⁷⁵ IAEA, *IAEA Launches Report Highlighting Achievements in South-South and Triangular Cooperation*, 2019.

¹⁷⁶ IAEA, *The Revised Guiding Principles and General Operating Rules to Govern the Provision of Technical Assistance by the Agency*, 1979.

¹⁷⁷ IAEA, *Medium Term Strategy 2018-2023*.

¹⁷⁸ IAEA, *Country Programme Frameworks*.

¹⁷⁹ *Ibid.*

¹⁸⁰ *Ibid.*

¹⁸¹ IAEA, *Technical cooperation programme*.

¹⁸² *Ibid.*; IAEA, *IAEA Annual Report 2017*, 2018.

¹⁸³ IAEA, *Funding the programme*.

¹⁸⁴ IAEA, *Technical Cooperation Report for 2017 (GC(62)/INF/4)*, 2018.

¹⁸⁵ IAEA, *How IAEA Technical Cooperation projects works*.

¹⁸⁶ IAEA, *Strengthening the diagnosis and management of transboundary animal diseases in Malawi*, 2017.

¹⁸⁷ *Ibid.*

¹⁸⁸ *Ibid.*

¹⁸⁹ *Ibid.*

¹⁹⁰ IAEA, *How CRPs work*.

¹⁹¹ *Ibid.*

sharp increase in child mortality.¹⁹² A CRP was initiated by the IAEA and gathered researchers from African and Asian MS in addition to Australia, United Kingdom, and the United States.¹⁹³ The CRP confirmed there were no negative impacts on the health of babies' breastfed by mothers infected by HIV.¹⁹⁴ The findings of the CRP therefore contributed to reduce infant mortality.¹⁹⁵

Other UN organizations are also involved in the dissemination of NT to achieve the SDGs and are important partners for the IAEA.¹⁹⁶ For example, the Food and Agriculture Organization (FAO) closely collaborates with the IAEA through the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture (DNTFA).¹⁹⁷ In addition to providing technical assistance, the DNTFA owns laboratories in Austria for the development of appropriate NTs that are important to agriculture, including animal production and health, insect pest control, and plant breeding.¹⁹⁸ The World Health Organization (WHO) is also involved in sharing NT to improve human health.¹⁹⁹ For 40 years, the IAEA and the WHO have collaborated on safe application of NTs for medical purposes.²⁰⁰ Under a recently signed Practical Agreement between the IAEA and the WHO, both organizations combine their network of experts and resources in several areas, including cancer control, nutrition, and environmental health.²⁰¹ For instance, the Sterile Insect Technique is a technique promoted by the WHO and the IAEA as a means to combat the Human African trypanosomiasis, a fatal parasitic disease affecting poor populations in Africa.²⁰²

Internationally, other organizations are also devoted to nuclear knowledge and technology sharing, such as the Nuclear Energy Agency (NEA).²⁰³ As a specialized agency of the Organisation for Economic Co-operation and Development, the NEA is especially devoted, but not limited, to the sustainable development and use of nuclear power to supply electricity.²⁰⁴ The NEA provides assistance in addition to conducting research, and its work areas include nuclear safety regulations, radioactive waste, and decommissioning management.²⁰⁵

Challenges to the use of nuclear technology to achieve the SDGs

Despite the strong support of the IAEA for the implementation of NT in MS to achieve the SDGs, resource availability and management remain important challenges for MS.²⁰⁶ For instance, despite the effectiveness of radiotherapy for cancer control, the IAEA is concerned that funding gaps will prevent developing MS from integrating radiation medicine.²⁰⁷ In addition, some NTs, such as nuclear power reactors, require MS to ensure the availability of infrastructure and financial resources over the long term.²⁰⁸ While guaranteeing the required resources for the safe and secure construction, maintenance, and decommissioning of nuclear power reactors, MS must also develop a national legal framework and

¹⁹² Apolitical, *Is breastfeeding with HIV safe? Years of mixed messages still cause problems?*, 2018; IAEA, *IAEA Research Project Confirms WHO Recommendation on Benefits of Exclusive Breastfeeding by HIV-positive Mothers*, 2018.

¹⁹³ IAEA, *IAEA Research Project Confirms WHO Recommendation on Benefits of Exclusive Breastfeeding by HIV-positive Mothers*, 2018.

¹⁹⁴ Ibid.

¹⁹⁵ Ibid.

¹⁹⁶ IAEA, *United Nations system*.

¹⁹⁷ Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, *FAO/IAEA Partnership*.

¹⁹⁸ Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, *FAO/IAEA Agriculture and Biotechnology Laboratories*.

¹⁹⁹ IAEA, *World Health Organization/Pan American Health Organization*.

²⁰⁰ IAEA, *IAEA and PAHO Sign Practical Arrangement to Enhance Collaboration in the Health Field*, 2017.

²⁰¹ Ibid.

²⁰² WHO, *What is human African trypanosomiasis?*, 2019; WHO, *The International Atomic Energy Agency – IAEA*, 2019.

²⁰³ OECD-NEA, *The Nuclear Energy Agency*, 2018.

²⁰⁴ OECD-NEA, *Nuclear energy and sustainable development*, 2016.

²⁰⁵ OECD-NEA, *NEA work areas*.

²⁰⁶ IAEA, *Strengthening of the Agency's technical cooperation activities (GC(62)/RES/8)*, 2018.

²⁰⁷ IAEA, *Nuclear Technology Review 2018 (GC(62)/INF/2)*, 2018.

²⁰⁸ IAEA, *Newcomer countries face common challenges in nuclear infrastructure development*, 2016.

an independent regulating body.²⁰⁹ To prevent or reduce the impact of these challenges, the IAEA hosts Integrated Nuclear Infrastructure Review (INIR) missions for MS embarking on new nuclear programs.²¹⁰ The INIR missions are cooperation projects aiming to establish strategies for these programs and addressing risks of resource scarcity through means to mitigate the risk.²¹¹ In addition to MS' resource scarcity, building and maintaining a skilled workforce is another important challenge for the sustainable use of NTs.²¹² MS, particularly in the least developed regions, often lack the infrastructures and capacity needed to train their skilled workforce and maintain their nuclear knowledge and capacity.²¹³ Despite the proven efficiency of programs such as the CPFs, the TC programme and the CRPs, the escalating number of cooperative projects supported by the IAEA in an increasing number of MS exceeds the current available resources of the IAEA in terms of funding and personnel.²¹⁴

To mitigate these challenge and in line with the 2030 Agenda, the IAEA encourages the development of differently structured partnerships, such as North-South or South-South cooperation.²¹⁵ These partnerships allow MS to pool resources and share expertise to face common nuclear needs.²¹⁶ In addition, developing MS that successfully implemented NTs with the collaboration of the IAEA to fight disease outbreaks or to develop climate-proof crops can also become an important resource for other MS facing similar challenges.²¹⁷ Thereby, such partnerships increase the sustainability of the contribution of the IAEA to the dissemination of NTs to achieve the SDGs.²¹⁸ In the upcoming years, the agency will be actively seeking new approaches to integrate these partnership strategies in its existing mechanisms, including the CPFs, the TC programme and the CPRs.²¹⁹

Conclusion

Nuclear technologies offer all MS sustainable techniques to directly address more than half of the 17 SDGs.²²⁰ Bearing in mind its mission to facilitate the dissemination of NTs for peaceful uses and to support developing MS, the IAEA plays an important role for the achievements of the 169 targets.²²¹ To do so, the IAEA has established several tools and programs, created dialogue between the different stakeholders, and enhanced partnerships. Despite these efforts, resource scarcity, lack of institutional capacity, and lack of skilled workforce remain considerable challenges for MS to benefit from these nuclear technologies.²²²

Further Research

As delegates research the topic, they should consider: How can nuclear technologies be further promoted to all Member States to support their efforts toward achieving the SDGs? What approaches can the IAEA adopt to optimally use its available resources to meet the needs of all MS now and in the future? What role could other stakeholders play, such as research institutions, civil society, or the private sector, in the efforts of supporting the adoption of nuclear technologies for global sustainable development? Nuclear programs requiring significant financial and human resources, how can these programs be sustainably and extensively supported, especially in developing regions?

²⁰⁹ IAEA, *Newcomer countries face common challenges in nuclear infrastructure development*, 2016.

²¹⁰ IAEA, *Integrated Nuclear Infrastructure Review*.

²¹¹ IAEA, *Newcomer countries face common challenges in nuclear infrastructure development*, 2016.

²¹² *Ibid.*

²¹³ *Ibid.*

²¹⁴ IAEA, *Strengthening of the Agency's technical cooperation activities (GC(62)/RES/8)*, 2018.

²¹⁵ IAEA, *IAEA Launches Report Highlighting Achievements in South-South and Triangular Cooperation*, 2019.

²¹⁶ *Ibid.*

²¹⁷ IAEA, *South-South in Action: Sustainable Development through the Peaceful Uses of Nuclear Science and Technology*, 2019.

²¹⁸ *Ibid.*

²¹⁹ *Ibid.*

²²⁰ IAEA, *How the IAEA Will Contribute to the Sustainable Development Goals*, 2015.

²²¹ *Ibid.*

²²² IAEA, *Strengthening the Agency's activities related to nuclear, science, technology and applications (GC(62)/RES/9)*, 2018.

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International Atomic Energy Agency. (n.d.). *Medium Term Strategy 2018-2023*. Retrieved 11 May 2019 from: https://www.iaea.org/sites/default/files/16/11/mts2018_2013.pdf

In 2018 the strategic objectives of the Agency were re-aligned toward its main goal of enlarging the contribution of atomic energy to the achievement of global sustainable development. In addition to supporting the use of nuclear technology, other objectives were also assigned to the IAEA, including the development of safety standards and verifying compliance to nuclear security in Member States. This document highlights the six main strategic objectives of the Agency for the period 2018-2023. Reading this document will provide the delegates a broad, but still concrete overview of the actions taken by the Agency related to nuclear energy.

International Atomic Energy Agency. (n.d.). *Strengthening the diagnosis and management of transboundary animal diseases in Malawi* [Report]. Retrieved 10 June 2019 from:

<https://www.iaea.org/sites/default/files/18/11/mlw5001.pdf>

Although several other successful stories of the IAEA partnering with Member States to adopt nuclear technologies could be used, reading this report will allow the delegates to understand a concrete example of support provided by the IAEA to a Member State. The report includes an introduction to the issue of animal diseases and describes forms of assistance provided by the IAEA. The report concludes with an impact assessment of the contribution of the IAEA to the issue.

International Atomic Energy Agency. (2018). *Nuclear Technology Review 2018*. Retrieved 01 June 2019 from: https://www-legacy.iaea.org/About/Policy/GC/GC62/GC62InfDocuments/English/gc62inf-2_en.pdf

This review compiles relevant information for the delegates on the progress of nuclear technology to address global issues across different domains, including agriculture, health and well-being, and affordable energy. Additional relevant information for the delegates include the remaining challenges, ongoing strategies, and outlook for solutions to consider. Reading this document will therefore allow the delegates to fully understand the role of nuclear technology in the achievement of the 17 SDGs.

International Atomic Energy Agency. (2018). *Strengthening the Agency's activities related to nuclear science, technology and applications (GC(62)/RES/9)*. Retrieved 14 May 2019 from: https://www-legacy.iaea.org/About/Policy/GC/GC62/GC62Resolutions/English/gc62res-9_en.pdf

This resolution was adopted at the most recent General Conference of the Agency. The resolution includes a list of calls of action for the Secretariat addressing various domains, including food security and public health. The resolution includes information-rich clauses for the delegates to understand the recent efforts of the Agency in strengthening the use of nuclear technology to achieve the SDGs. Therefore, this document is highly relevant for the delegates for their understanding of the role of the IAEA in the 2030 Agenda.

International Atomic Energy Agency, Office of Public Information and Communication. (2015, September 25). *How the IAEA will contribute to the Sustainable Development Goals* [News Article]. Retrieved 12 May 2019 from: <https://www.iaea.org/newscenter/news/how-iaea-will-contribute-sustainable-development-goals>

Limited to the necessary information for the delegates to initiate their research on the topic, this background guide only covers a few examples of the application of nuclear technology and the IAEA in the achievement of the SDGs. This article provides a valuable review of projects and links involving nuclear technology and the support of the IAEA throughout the nine SDGs where nuclear technologies can contribute. Links to projects will lead the delegates to valuable information for their research, including challenges faced in the application of nuclear technology.

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