

SAIMUN 2017 Research Report

Committee: Environmental

Issue Number 2: The question of the use of nuclear energy

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1. Description of Issue

The technology of nuclear fission has existed for more than half a century, and proven to be the most cost efficient means of producing energy so far. Its extensive potential in fields of medicine, electricity generation, and agriculture has been recognized by many governments including the United States, the largest producer of nuclear energy. The 'Fission' technology have continuously developed ever since the first discovery using radioactive isotopes, assisting the industrialization. It currently accounts for more than 11% of world's energy provision.

Despite these benefits that nuclear energy possess, the insufficient safety protection and the potential risk have lead to explosion of power plants, creating humanitarian disasters. One of the most notable example is the meltdown of Chernobyl power station in 1986. The over generation of power and failure in properly initiating an emergency shutdown caused explosions, which lead to evacuation of 350,400 villagers. More recently, in 2011, the coolant leakage in the Fukushima Daiichi power plant lead to 470,000 people being displaced.

The discovery of 'fusion' technique based on the collision of atoms to form tritium and deuterium has lead to wider application of nuclear energy. The isotopic and fusion techniques are not only used to manage replenishable and drinkable water sources, but also to measure nitrogen uptake in crops to increase the yield. Nuclear power has been accused of being the greatest cause of arms race and cold war in the mid 20th century. Although this is true to some extent, it is still considered as the most important technique in investigation of astrophysics and other industrial developments.

2. Definition of Key Terms

United Nations Of Sustainable Development (UNOSD) – UNOSD was formed in 2011 by the UN and the government of Republic of Korea, and has its purpose in facilitating the UN's activities regarding sustainable development through knowledge sharing, training, and partnerships.

Renewable Energy – It is a term used to indicate energy that can be naturally recycled and reproduced through natural cycle or mechanisms. Renewable energy is often seen as supplement of previously used fossil fuels and other non-eco friendly materials. Bioenergy, hydropower, solar energy, wind energy, and geothermal energy are all considered to be renewable energy sources.

IRENA (International Renewable Energy Agency) – IRENA is an organization supported by the European Union and over 170 countries that work alongside the United Nations with the aim of supporting transition into a sustainable energy future. It is mostly responsible of collecting statistics, studying different aspects of sustainable energy, facilitating renewable energy planning, and producing Global Atlas that maps renewable energy potentials by location.

IEA(International Energy Agency) - IEA was founded on 1974 by OECD countries that had insufficient energy resources. It currently consists of 29 countries and focuses on four areas, which are energy security, economic development, environmental awareness and engagement worldwide.

IAEA (International Atomic Energy Agency) - IAEA is an intergovernmental council that works with the aim of achieving scientific and technological co-operation in the nuclear field. It works to assist United Nations Sustainable Development Goals and peaceful use of nuclear energy.

UNAEC (United Nations Atomic Energy Council) - UNAEC was founded on 1946 by resolution 1 “To deal with the problems raised by the discovery of atomic energy”.

Nuclear Fission - Nuclear fission is a form of energy production technology based on the division of uranium atoms and the chain reaction that produce energy as a result, which have been used for more than 50 years.

Nuclear Fusion - Nuclear fusion is a form of energy production technology that uses light nucleus to join together to form a heavier tritium and deuterium atoms that produce energy as they collide.

3. Timeline of Key Events

Event	Description
1938 - Hann and Strassmann discovered ‘fission’ which referred to the splitting of uranium atoms with neutrons.	
July 1945 - The success of Trinity shot	Trinity shot was the world’s first nuclear weapon test organized by the US, which provided the confidence to continue investing in atomic bombs that caused massive humanitarian loss.
August 6th/9th 1945 - Dropping of Atomic bombs in Hiroshima and Nagasaki	This caused around 240,000 civilian deaths, deaths of over 90% of people within 500 meters of ground zero, A-bomb radiation illness, and other physical and mental health problems.

<p>1948 - UN General Assembly First Session</p>	<p>http://daccessddsny.un.org/doc/RESOLUTION/GEN/NR0/032/52/IMG/NR003252.pdf?OpenElement</p>
<p>1955 - The United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) was established</p>	<p>UNSCEAR works under the United Nations and assesses global effects of ionizing radiation. 27 nations that are assigned by the General Assembly provides scientists to the committee, which works to provide safe protection for the exposure of highly harmful radiation.</p>
<p>1979 - Partial meltdown of Three Mile Island reactors</p>	<p>The reactor coolant leaked from the system, which caused meltdown of the nuclear station. The incident was blamed on inadequate training of the workers, and lead to diffusion of radioactive gases into the atmosphere, pollution of groundwater, and increased radioactivity in the air.</p>
<p>1980 - Convention on the Physical Protection of Nuclear Material</p>	<p>It was signed at Vienna and New York on the 3rd of March. Until now, this remains as the only legally binding international convention regarding physical protection of nuclear material. The convention provides cooperation between nations and measures to regain smuggled nuclear material, legal punishments, and protection of nuclear facilities.</p>

<p>1986 - Power excursion of Chernobyl reactor</p>	<p>This incident lead to uncontrollable amount of radiation leaking, death of more than 50 firefighters and 4000 civilians due to cancer.</p>
<p>1992 - Principles Relevant to the Use of Nuclear Power Sources in Outer Space was created</p>	
<p>1992 - The Energy Policy Act was implemented in the US</p>	<p>The act was implemented in order for the US to increase the usage of renewable energy and authorize developing and researching the efficiency of various energy sources.</p>
<p>1996 - Comprehensive Nuclear-Test-Ban Treaty was created</p>	<p>http://www.un.org/documents/ga/res/47/a47r068.htm</p>
<p>2005 - International Convention for the Suppression of Acts of Nuclear Terrorism was held</p>	<p>The convention forces nations to create offenses within the scope of convention and form jurisdiction if necessary. It also addresses the responsibility of supporting the population affected physically and mentally by the use of nuclear weapons, and works in cooperation with IAEA.</p>
<p>2011 - Meltdown of Fukushima Daiichi power plant</p>	<p>The severe tsunami caused backup generators of 4 reactors to be demolished, which lead to the core melting down and hydrogen explosions. The amount of radiation released is known to be about</p>

	<p>20-30% of Chernobyl, but all civilians were evacuated before any health problems could be caused.</p>
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4. Position of Key Member Nations and Other Bodies on the Issue

China

China currently has 36 nuclear reactors, and 21 under construction. As a country that has recently started investing in nuclear energy, China plans to build the most advanced nuclear reactors that have the capacity of at least 150 GWe by 2030. Currently, China relies on coal for 73% of their electricity production due to its rapid growth in industries. The alarming status of China's air pollution level along with the coal-fired energy capacity level, which has been causing numerous health issues, has been an international concern for almost a decade. Recognizing these problems, the Chinese central government has made National Action Plan for Air Pollution Prevention and Control, which aims for 20% increase in non-fossil power generation annually, including nuclear energy.

Japan

After the Fukushima nuclear accident in 2011, Japan's energy policies have been mainly aimed to reduce the usage of nuclear power plants through phasing them out over the course of years. This led to an inevitable consequence of Japan becoming the second largest net importer of fossil fuels and largest importer of liquefied gas. Moreover, Japanese environmental policies have been focusing on the development of diverse renewable energy sources and reducing carbon emissions. Due to this continuous effort, energy from oil's share of total energy consumption has declined from 80% to 43% just in three decades. After the meltdown in Fukushima Daiichi power plant Japanese government announced banning nuclear power stations, but retreated the statement after realising that the economy relied too heavily on it to suddenly stop the operation.

USA

Fossil fuel still accounts for more than 80% of USA's energy consumption, but USA is also the largest producer of nuclear energy in the world. Currently, there are 99 power stations across 30 states, and four new reactors under construction, which are planned to be finished by 2021. Despite the increased yielding capacity and reliance on nuclear power over the course of 30 years, the continuous decrease in the price of natural gas lead to abandoning many of the existing nuclear power plant construction plans. The review process of construction of new reactors can take up to 5 years, and the government is highly involved in the industry as a whole, since the national energy policy is closely related to the position USA holds in the global community in areas such as foreign trade, defence policy, and nuclear non-proliferation. Although construction of further nuclear power plants was banned in California in 1976, the overall level of reliance is still escalating as the deregulation of electricity prices is continuing in other states.

5. Suggested Solutions

Although 'fission' in nature can be considered as the most renewable forms of energy, the artificial creation of these conditions still needs more improvement in terms of the safety, as meltdown of nuclear power plants in the past have caused detrimental health and social problems. The main obstacle that needs to be solved is the lack of up-front capital investment when building power plants because of the costly process. The lack of government support and public awareness are blamed as the main problems of this issue, and thus member states should focus on producing possible solutions that will deliver the accurate information and provide incentives for firms to take part in the initial investment.

The waste disposal and safety facilities need to be also improved, most likely through producing new disposal methods and implementing the modern containment method. Both Chernobyl and Fukushima Daiichi power plants did not use this containment method, which could have reduced the extent of meltdown and leakage of coolant. Other negative uses of nuclear energy such as nuclear weapons should be controlled through enforcement of more

forceful proliferation treaties and regulations, possibly consisting of economic sanctions and disadvantages towards nations that possess these weapons.

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