

Topic A: Building a Nuclear Free World to Avoid Disaster and Risk

TOPIC A: BUILDING A NUCLEAR FREE WORLD TO AVOID DISASTER AND RISK

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INTRODUCTION

Nuclear energy is an energy form created using nuclear reactions to generate heat, which is then converted into electrical power despite a heavy risk to human and natural environment. In addressing disaster and potential risk for the environment, early warning systems help us to manage predicted extreme crisis. Accelerating energy transformation from hazardous and contingent energy to clean and renewable alternatives is required to tackle disaster to human and natural life.

Nuclear technology was first developed in the 1940s, with emphasis on developing bombs that could cause the greatest possible damage. Nuclear weapons have been used twice in war, both times by the United States of America (USA) against Japan, during World War II. The birth of the nuclear age therefore coincides with the birth of the United Nations itself, following the end of the Second World War in 1945. Following the horrors of the Second World War and the disastrous implications of the nuclear bombs on the environment and on humanity, the focus started to shift towards a more peaceful purpose for nuclear technology. Such a shift marked the beginning of the use of nuclear energy for power generation. Today, over 440 nuclear power reactors provide 11% of the world's electricity¹.

The main advantage of nuclear power is the lack of emissions of carbon dioxide and other pollutants. It is therefore part of the sustainable energy strategy for rapidly industrialising countries, especially as it presents an alternative to traditional sources of energy. However, a great deal of concerns accompanies the use of such power. First and foremost, nuclear plants pose a significant environmental challenge, as there is no way to dispose of radioactive nuclear waste in a safe and economically sound manner to date. Nuclear plants also use a very large amount of water, having important implications on fish and larvae, which cannot survive in waters that nuclear plants draw on. Also, nuclear plants are highly vulnerable to hazards and accidents, in addition to them being dangerous targets for terrorist attacks. It is therefore imperative to remember the safety anxieties around the use of nuclear power. An important concern to mention revolves around the cost of nuclear power, which is already too high for developed countries to work with. Nuclear plants are in fact very large and expensive, and take too long to build. In addition

¹ <http://www.world-nuclear.org/information-library/current-and-future-generation/nuclear-power-in-the-world-today.aspx>

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to that, they are often incompatible with power grids in developing countries. Finally, nuclear technology poses the unavoidable concern of weapons proliferation risk².

Global economy pushes profitable and quick return in investments despite the long-term challenges society could face. Nuclear Energy Industry until today presents impact on social and economic effect on society. In order to move forward and contribute to promoting compassion, peace and sustainable living, sustainable and hazard free or less hazardous energy alternatives should be a way to go.

Ever since its establishment, the United Nations (UN) has sought to eliminate the proliferation of nuclear weapons. Numerous treaties and initiatives have been established on the topic, with aim of preventing nuclear proliferation and testing. In addition to multiple multilateral and bilateral treaties, the 1968 Treaty on Non-Proliferation of Nuclear Weapons (NPT) has been considered a landmark for the prevention of the spread of nuclear weapons³. In May 2017, a disarmament panel at the UN has presented a draft treaty on the complete ban of nuclear weapons, considering the increased threats posed by various countries' nuclear arsenal.

In addressing the issue of a nuclear free world, it is highly important to mention and emphasize, in this committee particularly, the complex debate around the nuclear energy plants and nuclear the global industry with heavy investments already in place by governments and business whilst other clean energy development alternatives in progress.

In the United Nations Environment Program (UNEP), delegates will be encouraged to present their respective country's position on the topic of nuclear energy and weapons, and their implications on the environment. Discussions will centre on the different ways the international community and the UN can build a nuclear free, less hazardous future.

Delegates are encouraged to touch on the following UN Sustainable Development Goals:

- SDG 7: Affordable and Clean Energy
- SDG 11: Sustainable Cities and Communities
- SDG 12: Responsible Consumption and Production
- SDG 13: Climate Action

² <https://wedocs.unep.org/bitstream/handle/20.500.11822/9932/UN-Environment-Guide.pdf?sequence=1&isAllowed=y>
<http://www.greenpeace.org/international/Global/international/planet-2/report/2009/11/nuclear-power-an-obstacle-to.pdf>

³ <https://www.un.org/disarmament/wmd/nuclear/>
<https://www.un.org/disarmament/wmd/nuclear/npt/text>

ALTERNATIVE SOURCES OF ENERGY

The current globalized world, driven by economic integrity and technological advancement, poses various challenges entertained in several complex regions of the world. **Energy security** is one of the core elements in a process of building a strong economy and a stable state. However, in the quest to energy security some planners face challenges for their practical solutions. Given the fact that planners who are working in utilizing alternative energy sources decide to choose from several alternative options such as: Nuclear, Geothermal, Hydro, Wind, Solar, Gas, Coal (Steamed & combined cycle), Oil (steam turbine). Nevertheless, some energy alternatives remain complicated and sophisticated. To this end, avoiding nuclear energy alternative is to deal with the negative impacts of nuclear reactions during construction and post construction.

On the other hand, projects to eliminate nuclear energy will require government's high determination to infrastructure spending which will fundamentally change the livelihood of the people and dictates economic and political strategy to exploit one's vast energy potential.

Some of the energy alternatives that the world could use to opt from Nuclear plant and nuclear use is to shift their energy options by assessing their available natural resources; to this date a few 'clean' energy alternatives have been scaled up and utilized in full scale use.

Hydro Power

One of the oldest methods of producing electric power is believed to be using hydro power generation method. The method being simple for people to use moving water to help them in their work throughout history, latest improvements and technological advancement has resulted in great use of the technique, using moving water to produce enormous amount of electric power. To harness energy from flowing water, the water must be controlled from its natural flow. This is often done by creating a dam to make a larger reservoir to guide the water through a tunnel of pipes in the dam and allowing the water to pass through and rotate a turbine which in turn will drive a generator that produces Electricity.

Hydro dams can have combined purposes, serving as power storage facilities and generation. During periods of peak electricity demand, the facilities operate for power generation in certain areas where demand is high and their generation is essential. On other periods where electricity demand is lower and use is limited, electricity from the grids can be used to spin the turbines backward that are meant to generate, which causes the turbines to pump water from a river or lower waters sources to be used again.

Hydroelectric plants have the advantages of being long term use, some even up to 135 years (<https://www.hydropower.org/a-brief-history-of-hydropower>) Also, hydroelectric plants are clean and have few emissions. Criticisms directed at large-scale hydroelectric plants include: dislocation of people living where the reservoirs are planned, and release of significant amounts of carbon dioxide during construction and flooding of the reservoir.

Solar Energy

The Sun being our ultimate source of the solar energy on earth, it is also a contributor for renewable energy resources by converting its light and heat into electrical and heat energy through a range of harnessing technologies such as photovoltaic, solar heating, concentrated solar heating etc. Through the sun's heat and light, we can transform this into electrical energy.

Bio Fuel

Bio fuel is a renewable forms of energy generation, despite its sustainability is in question. Biofuels have been around for as long as cars have. At the start of the 20th century, Henry Ford planned to fuel his Model Ts with ethanol, and early diesel engines were designed to run on peanut oil (National Geographic) <http://www.nationalgeographic.com/environment/global-warming/biofuel/>

But discoveries of huge petroleum deposits kept gasoline and diesel cheap for decades, and biofuels were largely forgotten. However, with the recent rise in oil prices, along with growing concern about global warming caused by carbon dioxide emissions, biofuels have been regaining popularity.

Unfortunately, this form of energy production is not simple. The process of growing the crops, making fertilizers and pesticides, and processing the plants into fuel consumes a lot of energy. It's so much energy that there is debate about whether ethanol from corn provides more energy than is required to grow and process it.

Wind Energy

Wind Energy is tapped using air flow through wind turbines, which in turn a rotation torque to mechanically power generators for electric power. Wind power, as an alternative to burning fossil fuels, is plentiful, renewable, widely distributed, clean, produces no greenhouse gas emissions during operation, consumes no water, and uses little land (wiki) http://en.openei.org/wiki/Wind_energy.

The solar energy that could be used by humans differs from the amount of solar energy present near the surface of the planet because factors such as geography, time variation, cloud cover, and the land available to humans limit the amount of solar energy that we can acquire.

Thermal Energy

This energy alternative refers to the internal energy on earth and its usage through heat and to create energy. Various Thermal energy alternatives are in use today, for instance geo-thermal energy is an example of Thermal Energy.

Like some other renewable energy alternatives, thermal energy is heavily dependent on geography of the thermal (heat) abundance. Often the thermal energy is extracted in gas form.

Wave Energy

Wave energy is an energy generated through wind and movement of water as waves. The mechanical energy is converted into electrical energy using Wave Energy Converting machines.

Wave has the potential to provide a completely sustainable source of energy.

Tidal Energy

Tidal power or tidal energy is a form of hydropower that converts the energy obtained from ocean tides into useful forms of power, mainly electricity.

Although not yet widely used, tidal energy has potential for future electricity generation. Many argue that the energy to be harnessed from Tides is easily predictable based on the season of the tidal flow. It is also a technology that is still in its infancy for full scale utilization.

DISASTER MANAGEMENT

Disaster is defined as something when an emergency or risky situation is prevalent and this possess a significant challenge or consequences to human and natural life. Disaster management is the ability to manage resources and responsibilities with available resources and technologies. When we raise the issue of nuclear energy use, one of its ample challenge is the hazard and risk involved with its generation.

According to United Nations Office for Disaster Risk Reduction (UNISDR) emergencies key points: radiation emergencies are a health risk to those directly affected; the people can be exposed to a radiation source with or without necessarily becoming contaminated with radioactive materials; effective risk communication is essential to both the public and emergency responders.

UNISDR also states key climate risk management points: Climate risk has a significant effect on public health in terms of malnutrition, diarrhea, trauma and air pollution. A combination of increasing vulnerability and risk of weather-related hazards are expected to result in more extreme events and disasters. Measures to reduce the health impacts from climate risks and associated climate change, include: strengthening public

The Chernobyl Disaster

The Chernobyl disaster was a nuclear accident that occurred on April 26, 1986, in Ukraine, in the former Soviet Union. The accident, which was caused by an unexpected power surge during a systems test, had catastrophic consequences, as it resulted in massive radioactive waste being released in the environment.

Following the disaster, 30 kilometres around the area around the nuclear plant had to be closed off.

In addition to the hundreds of workers that were killed due to the accident, as well as to those who got acute radiation sickness, the accident contaminated nearby areas inhabited by millions. The consequences of the accident are still relevant today.

<https://www.nrc.gov/reading-rm/doc-collections/fact-sheets/chernobyl-bg.html>

health systems based on partnerships with multi-sectoral actors; enhancing capacity of health systems to reduce risks and respond to public health emergencies; protecting hospitals and other health infrastructure from climate risks and effects of climate change; strengthening surveillance and control of infectious disease against climate risk; improving the use of early warning systems by the health sector; building public health interventions at local level to increase community resilience.

ENVIRONMENTAL ASPECTS OF NUCLEAR HAZARDS

Nuclear hazards relate to the dangerous risks to both the environment and human health,

related to nuclear energy, testing or power. Those are usually caused by radiations, or by uncontrolled explosions. When it comes to the environment specifically, both nuclear weapons and nuclear power reactors constitute big sources of concern. In fact, the potential risks associated with nuclear power may outnumber the benefits. Potential spills or radioactive waste must be contained from the environment for long periods of time and be maintained in complete isolation. However, if the containment of nuclear waste isn't successful, this may have catastrophic consequences on the environment and on human health⁴.

There are different incidents that can lead to nuclear hazards. Uncontrollable events, such as natural disasters, are a significant concern in relation to the risks associated with seismic activity. This in fact; opens the potential for radioactive release into the environment.

In addition to that, nuclear accidents and explosions are a high probability.

⁴ <http://fissilematerials.org/library/rr09.pdf>

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A third and equally dangerous type of risk relates to the vulnerability of nuclear power plants to terrorist or other planned attacks – which can have even bigger consequences on both the environment and human life.

Given the significant risks and hazards that attach to nuclear power, it is important for the international community to weigh the benefits and consider possible alternatives. Despite some environmental benefits in comparison to traditional sources of energy, nuclear power may lead to accidents and hazards with massive impacts on the environment and on human health. For this reason, it is necessary to keep on looking for alternative sources of energy, which need to be environmentally friendly, but also pose the least risks possible.

QUESTIONS TO REFLECT ON

When exploring their respective country's position on the topic, and debating possible resolutions, delegates are encouraged to answer the following questions. Those questions could also serve to guide delegates in drafting their position papers.

Background and Context

1. What is the status of the world in relation to nuclear energy?
2. What is your country's history concerning nuclear energy, power and/or weapons?
3. What is your country's status in relation to the topic?

Actions Taken

1. What measures has the international community taken when it comes to nuclear energy?
2. What actions has your country taken at the national level in relation to that? What about the international level?
3. What treaties, agreements or resolutions has your country signed or ratified?

Country's Current Position

1. What is your country's current position on the topic of nuclear energy? What about nuclear weapons?
2. Where does your country stand at the national, regional and international levels regarding those issues?
3. Has your country undertaken research or specific measures to counter or to promote nuclear energy?
4. What is your country's position and status on alternative sources of energy?

Possible Solutions

1. What research initiatives have been started or can be started on the topic?

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2. What further measures can be taken to counter the risks or the development of nuclear energy?
3. What are possible solutions to mitigate nuclear hazards?
4. How can your country contribute to building a nuclear free world?
5. What is the role of the international community in that regard?
6. What aspects should a resolution focus on?
7. Why is this important?

RECOMMENDED READINGS

International Hydropower Association, "A brief History of Hydropower", Hydropower.org, 2017, <https://www.hydropower.org/a-brief-history-of-hydropower>

Nuclear Energy Institute, Nei.org, 2017, <https://www.nei.org/Knowledge-Center/FAQ-About-Nuclear-Energy>

United Nations Office for Disaster Risk Reduction, unisdr.org, 2017, <https://www.unisdr.org/we/inform/publications/19985>

Open EI, wiki, 2017, http://en.openei.org/wiki/Main_Page

National Geographic: <http://www.nationalgeographic.com/environment/global-warming/biofuel/>