

**Forum:** Special Conference  
**Issue:** Promoting hydroelectric energy as an alternative to fossil fuels  
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**Position:** President

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## Introduction

Global warming is affecting the world more than ever with the developments in technology and humans' increasing dependence on energy sources to complete their daily tasks. From transportation to using household items, energy usage is evident and inevitable in a rapidly developing world and its maintenance and extraction is crucial to maintain global development. Energy can be extracted from a wide range of resources and with uncountable methods, but those resources can be classified under two titles as **fossil fuels** and **renewable energy resources**. Fossil fuels are known by their easy access and extreme damage to the environment, and the issue at hand investigates whether hydroelectric energy as a renewable energy resource can be used to replace fossil fuels for the sake of environment. This issue has paramount importance because hydroelectric energy is a rewarding energy source for most nations in the world, and its promotion could make a difference towards eliminating the use of fossil fuels in the future. Currently, various technology hubs and think tanks all over the world are thinking innovatively to incorporate the use of renewable energy resources in life. From windmills working with river flow to enhanced contemporary dams, hydroelectric energy has been a part of human history even if it is based on simplistic technologies. For a source that required little maintenance, simple technologies for maximization and long history, hydroelectric energy is not receiving neither the credit nor the attention it deserves, and there from the necessary legal frameworks to economic support and public awareness, actions should be taken to exploit this potential dominating energy source.

This issue is worthy of debate not only for its relevance to topical issues about environment nowadays, but also because it directly relates with the theme of RCIMUN 2017. "*Water: The Fundamental Source of Life, Wealth and Conflict*" is a theme that directly concerns the management of water related issues to ensure the sustainability of the world both in terms of material and intellectual matters. The special conference is responsible for a thorough discussion of the issues related to the conference theme to allow links between different disciplines, and promoting hydroelectric energy as an alternative to fossil fuels allows an environmental, political, economic and even a humanitarian approach. Due to the flexible frame of the special conference, more social aspects of the theme such as conflict and life can be well connected an issue with environmental roots, and resolutions incorporating the United Nations (UN) organs can be written with ease.

## Definition of Key Terms

**Hydroelectric Energy:** Hydroelectric energy is the energy that flowing water captivates which can be transformed into electricity. Dams store water in their reservoir to release the water later in order to make a generator generate electricity and there are different systems that allow the generation of electricity according to the technology available and the geographical features of the region. In addition to dams that produce electricity for masses and contribute to the mainstream electricity storage system, smaller systems to generate hydroelectric power such as micro-hydroelectric water systems utilizing narrow water pathways and streams can also be used for households and small communities. Regardless of the method and the size, hydroelectric energy is a renewable source of energy and while being cost effective, it also has environmental and practical benefits (Renewable Energy World).

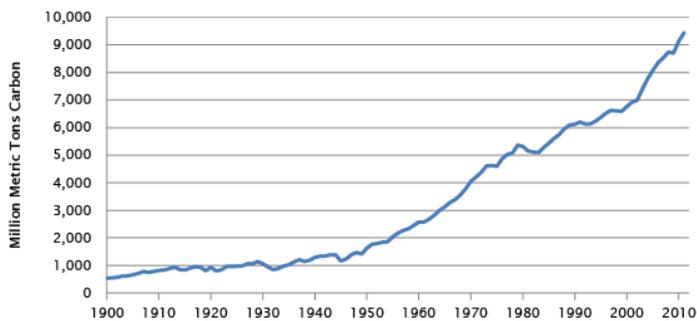


Figure 1: Global Carbon Emissions from Fossil Fuels

**Fossil Fuels:** Fossil fuels are the primary energy sources in the world and they include a variety of sources such as natural gas, oil and coal, Fossil fuels are not renewable because they are formed when organic material is buried in a place for millions of years and changes its form over the course of time. Fossil fuels are not sustainable because they are finite

resources, and they present environmental hazards because the burning of the to extract energy generates the majority of CO<sub>2</sub> emissions in the world and result in extreme amounts of waste materials (Environmental and Energy Study Institute). Fossil fuels are known to contribute to the global warming and even though they have been replaced with more renewable energy sources day by day, the combustion of fossil fuels still dominates the energy industry as the energy source (Science Daily). As also seen in Figure 1, global carbon emissions from fossil fuels have increased with the rise of industrialization (Carbon Dioxide Information Analysis Center).

**Renewable Energy:** This source of energy is generated from natural resources and as the name suggests, they are not finite resources and are naturally replenished without effort. Examples include hydroelectric, geothermal, wind, solar, rain and tidal energy and there has been substantial progress about the ways to exploit the infinite resources the nature offers the humankind to use. Renewable energy is environmentally friendly because while there are no combustion processes, the only carbon emissions are resulted by subsidiary technologies aiding renewable energy that overweighs the environmental benefit it creates. The use of the correct renewable energy source depends on the resources that a country has, but it can be said that every country has the potential to benefit from renewable energy due to its natural existence (Ciolkosz).

**Sustainability:** This is a term that has different meaning according to its context, and applicable to the context of energy sources and development, it means "a process of change in which the exploitation of

*resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations* (The World Commission on Environment and Development)." Sustainability is important for energy revolution because a sustainable transition from fossil fuels to renewable energy sources requires a controlled usage of the natural resources, financial management, and other factors so that a change that is supposed to help humans does not create problems, represents the public opinion, becomes efficient and does not interfere with the existing positive system. For a sustainable transition, a time frame should be established to allow adjustments and the opinions of different stakeholders should be taken into consideration to protect liberties.

## **General Overview**

To be able to promote hydroelectricity as an alternative to fossil fuels, one should firstly understand the specific benefits of utilizing hydroelectricity. Such benefits can be used to extend the discussion of the topic to other fields of study such as environmental benefits, daily life effects and legal implications. Resolutions aiming for a holistic approach on solutions should aim to incorporate different implications as stated below to be as realistic as possible.

To begin with, hydroelectricity is a renewable energy source and since it uses the energy coming from the flowing water, it does not consume any water but instead benefit from a physical energy that is otherwise lost. In hydroelectric sources as dams, water is stored in order to release them when energy is needed, meaning that hydroelectricity is open to use even if the water is not running because the storage of water later allows the stimulation of the flow. This is substantially an advantage because other renewable energy sources such as wind energy and solar energy can be produced only when the natural events of wind and sunlight happens, meaning that they are not accessible to humans indefinitely. On the other hand, hydroelectricity is storing the source of energy to utilize later on, so it provides access to energy even when other fossil and renewable energy sources are in short quantities. Moreover, hydroelectric power plants allow the usage of other renewable energy resources, meaning that they create a nature-friendly energy surplus. Hydroelectric power plants often have solar panels that turn solar energy into electricity, and in addition to that, the existence of hydroelectric powers in a region increase energy security among residents who want to benefit from in-house energy systems such as solar panels and wind turbines. This sense of security is created because citizens can use solar panels and wind turbines in their residential areas, knowing that if their renewable energy source is in short supply, they can always rely on the electricity generated by hydroelectric power facilities.

Although different governments have different approaches on the privatization of energy sources, whether hydroelectric power plants are owned by the governments or private corporations, there is always government regulation on such resources because water bodies and rivers are domestic resources that government is responsible for overseeing. This in return ensures the citizens and the government that no price fluctuations would happen and the cost of such a crucial energy source as electricity can be

maintained in reasonable levels for the consumers' sake. While fossil fuels such as oil and natural gas are extremely dependent on market fluctuations and they operate in global markets that reduce the protectionist measures that can be implied in foreign resources, hydroelectric energy is exempt from such a global trade effect because it is mostly a domestic resource (although some bilateral agreements have been observed in the history as explained in the *"Timeline of Events"* section).

Regarding the physical structure of dams, hydroelectricity is also beneficial because it is storage for drinking water. Since dams are open structures and they collect rainwater and river flow, they produce storage for farmers' irrigation and public water usage at residences. This is very important in the sense that in the eye of global warming, water is becoming a resource that should be overseen carefully for the future generation and building structures for hydroelectricity also helps the humans to use water to a greater extent without creating and waste materials. Speaking in technical terms, hydroelectricity is also a flexible resource when different voltages of electric is needed for different purposes. Energy produced from hydroelectric power can easily be inserted into electricity web in regards to any other fossil fuel or renewable energy sources. And since it can be manipulated to create electricity in times of need, it is a facilitated way for the government to respond to fluctuating levels of demand and supply for electricity without addressing other energy sources or playing with the prices.

Hydroelectricity also has a positive effect on the air by not releasing any gas wastes that contribute to acid rains and air pollution. Hydroelectric power stations also aid economic development. When a hydroelectric power station is installed, other infrastructural features such as electricity, roads and commerce opportunities are also introduced to the area to ensure sustainable development. The proliferation of such features in long run improve the quality of life by increasing access to education and health and is an easy way to commence development. Hydroelectricity also creates jobs because it requires management and maintenance and by creating jobs, it not only creates jobs in the places it is establishes but also contributes to lowering unemployment if the country deems it a goal.

Investments in hydroelectricity are long-term because while having low operation and management costs, their upgrades to more contemporary technologies can be easily done. This means that hydroelectric power plants last very long and they stand strong between 50 to 100 years. Last but not the least, hydroelectricity is perfect for sustainable development. For an energy source that has low maintenance costs, environmentally responsible, hydroelectricity is in line with the definition of sustainability and allows healthy economic development.

## **Major Parties Involved and Their Views**

**United States:** The US depended highly on hydroelectric in the past but currently, hydroelectric accounts for approximately 7% of the total electricity produced, being the most used renewable energy resource in the US. With a long history of utilizing water resources for electricity production and a huge portfolio of water-bound resources, the US has high potential to increase its dependence on hydroelectricity; however, hydroelectricity is generated mostly in the Western states and those states face the serious danger of

drought. Because of this problem, the US is trying to change its water resource management to first solve the problem of drought and second to reclaim its status of a powerhouse of using hydroelectricity to its full extent (Energy Department)

**China:** The capacity for hydroelectricity in China accounts for the 16% of the total energy generation in the world and is in constant increase. It is the most used form of electricity in China and China's hydroelectric capacity exceeds any other country, more than Brazil, the USA and Canada as the next three combined. As an economy with rapid economic growth and a country with extreme greenhouse gas emissions, the use of hydroelectricity in China is crucial to not contribute to its current status as a country that massively contributes to global warming and to ensure to healthy economic development (Solidiance).

**SE4ALL:** "Sustainable Energy for All" is a universal energy access initiative established by the UN, which in the past was preoccupied with accomplishing sustainability related Millennium Development Goals. The initiative has three main objectives to accomplish by 2030 and those objectives are (UN General Assembly):

- Ensuring universal access to modern energy services
- Doubling the rate of improvement in energy efficiency
- Doubling the share of renewable energy in the global energy mix

The objectives of SE4ALL are crucial to establish a sustainable energy reform globally and as a renewable energy source, hydroelectricity can benefit immensely from a global initiative prioritizing the use of renewable energy resources.

**European Union (EU):** Members of the union have different approaches to renewable energy and hydroelectric power, but the EU has taken steps towards promoting the use of renewable resources recently. The aim is to have 20% of all energy consumption in the EU from renewable energy resources and this translates to an opportunity to growth and development of energy facilities and upgrading the existing ones in Europe. For the case of hydroelectricity, some countries have made substantial efforts. Norway, United Kingdom, Slovenia, Austria and Switzerland are progressing towards enhancing their facilities and new facilities are being built in countries such as but not limited to Spain, Italy and France (Barnes).

## **Timeline of Events**

This timeline of events mostly focuses on the progress made in North America and the UK because countries in these regions are the pioneers hydroelectric power and the developments happening there are the starting point of the spread of techniques and technologies all over the world. Also, the progress

made in the US is explained specifically to allow the comparison of hydroelectricity usage in different times (Foundation for Water & Energy Education) (Time Toast) (Time Toast) (Crosley).

<b>200 BC</b>	The first water wheel was being used for daily tasks such as and irrigation grinding grain.
<b>1600</b>	Water mills became an important resource of energy in England.
<b>1800</b>	The Industrial Revolution started and it used water wheels heavily for industrial activities.
<b>1883</b>	The first hydroelectric plant was opened at Ireland.
<b>1889</b>	In the US, 200 electric companies use only hydropower for energy generation.
<b>1895</b>	A hydroelectric power generator opens at Niagara falls.
<b>1940</b>	Hydroelectric power account for the 75% of the total electricity in Western US and approximately one-thirds for the US in total.
<b>1961</b>	The US and Canada sign the Columbia River Treaty that helps Canada benefit from the power and flood control facilities in the US and helps the US to benefit from the storage dams in Canada.
<b>1995-2011</b>	Federal hydroelectric projects in the US invest to mitigate the negative effects on marine habitats and wildlife.
<b>1997</b>	Hydroelectric energy accounts for the 10% of electricity generated in the US.
<b>2011</b>	In the world, hydroelectric power accounts for 20% of the total energy generated.
<b>2012</b>	7% of the energy generated in the US comes from hydroelectricity and the rest from fossil fuels.

## UN Involvement

UN involvement has happened by organizations such as SE4ALL and different initiatives are also supported to facilitate and speed up the reform. Organizations such as International Energy Agency and United Nations Educational, Scientific and Cultural Organization(UNESCO) are trying to increase share of hydroelectricity, which has been stable since the 1990s (UNESCO). Still, the efforts made are hardly adequate and their focus on renewable energy resources does not regard hydroelectricity as a field with the highest potential, hence the UN should be urged to make more tangible efforts and take actions specifically for hydroelectricity.

## Relevant UN Documents

### Promotion of new and renewable sources of energy, 15 August 2011, A/66/...

The resolution adopted by the General Assembly discusses the promotion of new and renewable sources of energy and it also includes hydropower as an energy source with the highest capacity (UN General Assembly).

## **Social Impacts and Social Risks in Hydropower Programs, 27-29 October 2004**

This is a paper released in the UN Symposium on Hydropower and Sustainable Development in Beijing, China and it provides a holistic and realistic analysis of the implications of using hydroelectricity (Cernea). This is a crucial source for those who want to include a humanitarian aspect in their resolutions and since the paper clearly identifies the planning and risks associated with the promotion of hydroelectricity, this resource can help resolution writing process and result in productive clauses. The link can be found in the bibliography section and delegates are strongly urged to review this document.

## **Treaties and Events**

**UNFCCC:** The UN Framework Convention on Climate Change specifies that governments should be working collaboratively to minimize the damages of using fossil fuels and search renewable energy sources as alternatives. This convention also urges developed countries to decrease their greenhouse gas emissions since developed countries have the highest rates of dangerous gas emissions (UNFCCC).

**Kyoto Protocol:** This is an international agreement linked to the aims of UNFCCC, and it has binding clauses for ratified nations on emission reduction aims. The protocol was adopted in 1997 and it is currently in its second commitment period. A thorough understanding of the protocol can pave the way to make suggestions for alterations of its cases and specific addition of hydroelectricity (UNFCCC).

## **Evaluation of Previous Attempts to Resolve the Issue**

Even though many member states ratified the UNFCCC, it is not taken seriously by the nations as there is not adequate sanctions for the nations who do not take the necessary actions to decrease their greenhouse gas emissions. Air pollution caused by the use of fossil fuels is still increasing and a possible addition for the convention can be to specify the use of hydroelectricity to create an incentive for the nations to focus on the promotion of hydroelectricity.

## **Possible Solutions**

The following guiding questions can be used to devise clauses and find possible solutions:

- What incentives can be created to increase the use of hydroelectricity?
- What are the humanitarian and legal aspects of promoting hydroelectricity and how can it be achieved?
- How can hydroelectric energy be made more affordable and desired for investors/governments?
- What kind of a timeframe can be created for the adoption of hydroelectricity?

While answering these questions, delegates should incorporate the arguments and expectations of different stakeholders, most importantly the governments, and be realistic about the sanctioning powers of

the authorities. While raising awareness is important in this sense, the parties to respond should be regarded as authorities and while including the effects on the public, delegates should aim for more bureaucratic solutions.

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