Committee: Environment
Question Of: Implementing Renewable Energies
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Introduction:

In order to meet growing demands of energy around the world, countries and individuals alike are faced with choosing between two types of energy: non-renewable and renewable energy resources. On one hand, non-renewable energy resources such as coal and oil are utilized faster that they can be replenished, rendering them finite, meaning that their availability is limited. On the other hand, renewable energy sources such as solar and geothermal are replenished by nature at the same time that they are utilized, rendering them infinite, meaning that their availability is unlimited. Even though most entities resort to the use of non-renewable energy sources due to their perceived economic advantage, their extraction and resulting employment has significant environmental repercussions, thereby leading to critics arguing that they are unsustainable long term and should instead be replaced with environmentally-friendly renewable energy sources. Along those lines, renewable energy sources present themselves as a viable alternative to their non-renewable counterpart and a growing number of entities are resorting to them as means of energy sources because of their long-term and environmental benefits. That being said, a pressing question arises regarding the feasible implementation of currently-developed renewable energy technologies in the context of reducing environmental impact long term as well as ensuring economic sustainability.

The Issue:

Current Implementation of Non-Renewable Energy

Non-renewable, and more specifically, fossil fuels, were the traditional energy sources for the better part of human history due to their relatively easier and cheaper extraction. As a result, many components of modern-day society are dependant on them whether it be vehicles or power plants. To a certain extent, even local and global economies rely on them as the main source of energy. The presence of non-renewable energy sources in various forms around the world leads to them being continuously extracted by almost all countries around the world through different methods as means of providing energy for the functioning of the countries.

Advantages of Non-Renewable Energy

Non-renewable energy sources tend to be more reliable when compared to renewable energy sources because they do not depend on whether conditions. In other words, regardless of the weather, they provide a continuous and reliable source of energy. Furthermore, the development of new technologies by governments and organizations alike are helping make those resources more sustainable in the long term. A prime example of that would be Carbon Capture

and Storage (CCS) that captures carbon dioxide that has been emitted into the air and stores it underground.

Disadvantages of Non-Renewable Energy

The main concern of many countries regarding non-renewable energy sources is their environmental impact. Whether it be underground mining of Earth's resources, accidental oil spills or even nuclear power plant disasters, non-renewable energy sources have a significant environmental damage. For instance, the burning of fossil fuels by power plants and vehicules leads to the release of carbon dioxide, more commonly referred to as CO2, which contributes to the greenhouse effect. This aforementioned phenomenon traps energy and temperature on Earth, thereby leading to global warming, which in turn, has a plethora of negative environmental consequences. Furthermore, non-renewable energy sources have a limited supply, meaning that that they will eventually be depleted.

Current Implementation of Renewable Energy

According to the United States Energy Information Administration, five main types of renewable energy resources can be identified: biomass, hydropower, geothermal, wind and solar. Biomass energy consists of burning organic material that comes from dead plants and animals, hydropower energy consists of producing energy from naturally-moving water through mechanisms such as dams, geothermal energy consists of using Earth's natural heat through steam or hot water, wind consists of using earth's wind cycle to produce energy such as electricity through mechanisms such as turbines and finally, solar energy consists of producing energy, whether directly or indirectly from the sun's light through mechanisms such as solar panels. A growing number of entities and countries are resorting to renewable energy sources. In fact, their share of total global energy supply is ever increasing and slowly overtaking the share of non-renewable energy sources. This is a result of consumers becoming more and more aware of the adverse environmental repercussions of non-renewable energy sources as well as the increase of renewable energy mechanisms that are becoming cheaper and more available due to government-led as well as private research and development initiatives.

Advantages of Renewable Energy Resources

Renewable energy sources are much more eco-friendly when compared to non-renewable energy sources. This is a result of renewable energy sources not being burned like their fossil fuels counterpart that release release greenhouse gases as well as pollutants into the environment. In other words, the use of renewable energy sources does not leads to an increase in global temperatures. Furthermore, renewable energy sources are found everywhere around the world sand are available to all countries. They also can not be depleted and therefore are sustainable long term. Finally, upfront costs of utilizing renewable energy resources is decreasing due to advancement in technology and maintenance costs tend to be generally lower.

Disadvantages of Renewable Energy

The upfront cost of utilizing renewable energy tends to be relatively high. The initial implementation and subsequent upkeeping also requires careful large-scale planning and high capital. In addition to that, renewable energy sources tend to be unreliable as they are affected by external factors such as weather conditions. For instance, a solar farm is expensive, requires a

large amount of land, can not operate at night and is less efficient when weather conditions are not optimal such as during cloudy or rainy days.

Key Parties:

China

According to the World Economic Forum, at the beginning of the year 2017, China announced that it was planning on investing more than 360 billion dollars in renewable energy by 2020, and scrapping plans to construct 85 different coal-powered plants. In fact, according to the World Economic Forum, China invests more than the United States and the European Union combined in domestic renewable energy every year. China invests Even though China's economy is highly dependant on non-renewable energy resources such as coal, China's continued investment in cutting-edge technology as well as committed government-lead shift to reliance on renewable energy sources place China at the center and as a leader of this energy transformation.

European Union

According to the European Commision, the European Union's own renewable energy directive dictates that 20% of the total energy consumption should be generated by renewable energy sources by the year 2020. In fact, each European Union country has adopted its own renewable energy action plan highlighting different actions being undertaken in order to reach the country's goal, whether it be 10% in Malta or 49% in Sweden. ALong those lines, each European Union country also publishes a report every two year showing progress made towards reaching their renewable energy goals. Those legislative documents along with public support schemes by the European Union to renewable energy technologies make the European Union as a whole a leader when it comes to renewable energy resources.

United States

Even though most of the United State's energy is produced using fossil fuels, according to the U.S. Energy Information Administration, 15% of the total energy of the country is provided by renewable energy sources. Along those lines, many initiatives are being conducted in the United States in order to limit the environmental impact of energy extraction and use. For instance, the United States Department of Energy is currently testing out the Carbon Capture and Storage (CCS) technology and its efficiency. Furthermore, most hydropower energy production, which accounts for 7% of the United State's total energy output, is occuring at government-constructed facilities such as the Grand Coulee Dam.

Key Events:

Date	Event	Explanation
1838	Photovoltaic effect	French scientists Henry Becquerel discovers the photovoltaic effect which is the production of renewable energy from the sun

1882	First hydroelectric plant	Energy is getting harnessed through the use of water for the first time in the United States
1888	First windmill	Energy is getting harnessed through the use of wind for the first time in the United States
1938	Nuclear fission	German scientist Otto Hahn discovers the process of nuclear fission to produce energy
1980	First wind farm	The world's first wind farm is build in the United States
1981	First solar plant	The world's first solar farm is build in the United States
1986	Chernobyl	The world's worst nuclear meltdown, highlighting the danger of non-renewable energy
1996	Hydrogen Future Act	Law passed aiming at expanding the research and development of hydrogen power as a renewable source of energy
2003	FutureGen	Plans are announced for the world's first ever coal power plant with zero emission
2013	Solar power plant	The world's largest solar power plant goes online in the United States

Previous Attempts to Solve the Issue:

Legislative Attempts

Legislative actions have been taken by many entities in order to implement renewable energy. For instance, the European Union implemented a directive that sets a renewable energy goal of 20% by 2020 and also urged countries to publish reports of their progress towards that goal. Furthermore, fines as well as taxation by many countries on industries and sectors of the economy that rely on fossil fuels and emit carbon dioxide as a result have also helped the shift towards cleaner renewable energy as an eco-friendly alternative. The United Nations has also been at the forefront of attempt to solve the issue through mechanisms such as the United Nations Energy Programme (UNEP). According to their official website, this United Nations agency has provided advice to developing countries as well as raised awareness about successful policies that promote renewable energy and its benefits.

Monetary Attempts

Many regard monetary investments as the best way to approach the issue. In fact, many countries such as China and the United States have invested billions of dollars into renewable energy. Furthermore, many investments are being made by non-governmental organizations as well as private investors into cutting-edge technology that promotes the use of renewable energy. For instance, the Global Energy Efficiency and Renewable Energy Fund (GEEREF) focuses on small and medium scale projects which deploy proven technologies that support renewable energy in emerging markets. This large flow of capital into the research and development of new technology has allowed for leaps that have facilitated the implementation of renewable energy

mechanisms, both in terms of costs and availability. In addition to that, according to their official website, the United Nations Energy Programme (UNEP) has previously provided financial support as well as promoted investment into renewable energy projects around the world as means of promoting the transition into renewable energy.

Technological Attempts

As a consequence of both legislative and monetary actions, technological attempts have been undertaken as a way to ensure the proper and efficient implementation of renewable energy. In fact, the implementation of renewable energy largely relies on advancements in technology that lower initial as well as maintenance costs and make it more efficient as well as available around the world. In fact, according to the Massachusetts Institute of Technology Technology Review, in the year 2016 alone, many advancements have been made in clean energy such as solar thermophotovoltaics, perovskite solar cells and artificial photosynthesis, all of which have helped further the efficiency and limit the environmental impact of the use of renewable energy sources.

Possible Solutions:

Through this research report, a number of issues have been presented in the context of the implementation of renewable energy around the world by different countries. In fact, many possible solutions can be inferred directly or indirectly from the information provided. Needless to say, delegates are urged to further research on the topic in order to build upon the subsequent possible solutions. Please note that the following list of solutions are general in nature, non-exhaustive, and should serve solely as a guideline for further analysis.

- Establish an international directive that urges all countries to prioritize the shift from non-renewable to renewable energy sources within each individual country and sets a list of guidelines as well as action plans to be undertaken
- Promote the cooperation and sharing of technology as well as information between different states in order to holistically approach the issue and find a solution as well as encourage the participation of all countries
- Support grassroot initiatives led by NGOs and small private companies that are researching, developing and implementing renewable energy solutions on a smaller scale as a way to pave the way to innovative and catered solutions to local problems
- Encourage least developed countries (LDCs) to participate in the global implementation of renewable energy sources through monetary donations as as developmental programs within those aforementioned countries
- Compel every nation to release periodic reports on progress being made in regards to the implementation of renewable energy sources and hold nations that fail to make progress accountable

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