

Forum: Economy and Society Council

Issue: Promoting the implementation of clean energy to ensure sustainable development

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Introduction

The emission of greenhouse gasses has increased since the Industrial Revolution and caused tremendous effects on the global environment. Countries around the world are facing extreme weather changes and the rise of temperature. Nowadays, the main contributor to the emission of greenhouse gasses is the burning of fossil fuels, especially coal, which generates carbon dioxide that traps the sun's heat in the atmosphere. With the establishment of the Sustainable Development Goals which set an agenda to meet 16 goals that increase development in 2015, Goal 7 looks to "ensure access to affordable, reliable, sustainable and modern energy for all" (UN), and goal 12 looks to "ensure sustainable consumption and production patterns" urging countries to make changes to their current use of energy. Clean energies, such as solar, geothermal, hydro, and wind, which do not emit greenhouse gasses, have been used more and more to solve the climate change crisis.

Definition of Key Terms

Clean Energy

Clean energy is energy that produces zero greenhouse gas emissions and therefore does not contribute to global warming. Examples of clean energy include: photovoltaic (solar), wind, hydro, geothermal, and nuclear energy. While nuclear energy is classified as clean energy, it is not renewable nor does it have zero environmental impacts. Nuclear energy still produces toxic radioactive waste and through the nuclear reactor cooling process, uses large amounts of sea water, returning warmed water back to oceans which can be detrimental to organisms who have very narrow survival niches.¹

¹ "What Is Clean Energy? How Does It Work? Why Is It so Important?" TWI, <https://www.twi-global.com/technical-knowledge/faqs/clean-energy>.

Sustainable Development Goal (SDGs)

The 17 sustainable development goals are a set of goals that were created by member states of the United Nations in 2015 in order to recognize some of the urgent problems around the globe that need to be fixed. The sustainable development goals aim to “end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity” (UN).²

Among the 17 goals, goal 7 focuses on sustainable energy. Goal 7 aims to “ensure access to affordable, reliable, sustainable and modern energy for all” (UN), which supports the idea that the implementation of renewable energies is a essential to promoting sustainable development because energy garnered from natural sources such as the sun, water, wind, underground-heat is more persistent in supplying energy compared to fossil fuels or nuclear energy, which will eventually run out. They will never run out and can be used as long as the Earth continues its natural cycles. Since the establishment of the SDGs, countries are gradually working towards each goal. For goal 7, the current leading region for renewable energy in proportion to their net energy consumption is Sub-Saharan African with 67.7 percent renewable energy consumption; whereas the lowest regions for renewable energy is West Asia and North Africa with only 5.2% of consumption rate.³

Sustainable Development

Sustainable development is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (UNESCO). Renewable energy is an exemplary way to promote sustainable development since it will not create greenhouse gasses that will affect the future generations.⁴ On the contrary, unrennewable energies, such as fossil fuels, coal, oil, and natural gas can generate harmful chemicals and pollute the environment, causing harm to the livings and ecosystem of the globe. Renewable energy can help achieve sustainable development because the energy these sources generate are unlimited—they will not run out in the future. Nonrenewable energy, however, will run out in the future because they are being extracted at rates faster than they are being created.

Fossil Fuel Energy

² “Sustainable Development Goals: United Nations Development Programme.” UNDP, <https://www.undp.org/sustainable-development-goals>.

³ Tracking SDG 7, The Energy Progress Report, https://trackingsdg7.esmap.org/results?p=Renewable_Energy&i=Renewable_Energy_share_in_Totals_Final_Energy_Consumption_%28%25%29.

⁴ “Sustainable Development.” UNESCO, 20 Aug. 2015, <https://en.unesco.org/themes/education-sustainable-development/what-is-esd/sd>.

Fossil fuels are “fuels such as coal or gas, formed in the geological past from the remains of living organisms” (OCEAN). Despite the fact that governments around the world are setting policies which move away from the use of fossil fuels, they are still the dominant source of energy in the world. The process of generating energies using fossil fuels is time-consuming, heavily resource-reliant, and detrimental to the physical and chemical environment.

Firstly, the process of extracting fossil fuels completely removes or significantly displaces topsoil which leads to erosion, loss of habitat through deforestation, and other environmental impacts. The process of mining fossil fuels also contaminates water with toxins and chemicals, which can be detrimental to aquatic ecosystems as well as to people if reservoirs are contaminated. In addition, the process and combustion of coal and other fossil fuels releases harmful chemicals in the air like “sulfur dioxide, nitrogen oxides, carbon dioxide, volatile organic compounds”⁵ which affects public health through the increase of lung, cardiovascular, and kidney diseases.

The process of transporting fossil fuels also contributes to environmental degradation. The machinery which transports the materials from mines to power plants is rarely electric, and it emits harmful gasses into the air only increasing the carbon footprint that fossil fuels leave. Another important thing to note is that when these fossil fuels are being transported, a lot of dust or excess materials percolate in air which results in serious cardiovascular and respiratory risks for communities near coal transportation routes.⁶

Greenhouse Gasses

Greenhouse gasses are the gasses that “have the property of absorbing infrared radiation (net heat energy) emitted from Earth's surface and reradiating it back to Earth's surface”⁷. Examples of greenhouse gasses include CO₂, methane, and nitrous oxide.⁸

⁵ “Coal Combustion.” ScienceDirect, 2017

<https://www.sciencedirect.com/topics/engineering/coal-combustion>

⁶ “The Hidden Costs of Fossil Fuels.” Union of Concerned Scientists, <https://www.ucsusa.org/resources/hidden-costs-fossil-fuels>.

⁷ “Greenhouse Gas.” Encyclopædia Britannica, Encyclopædia Britannica, Inc., www.britannica.com/science/greenhouse-gas.

⁸ “Greenhouse Effect 101.” NRDC, 23 July 2019, <https://www.nrdc.org/stories/greenhouse-effect-101>.

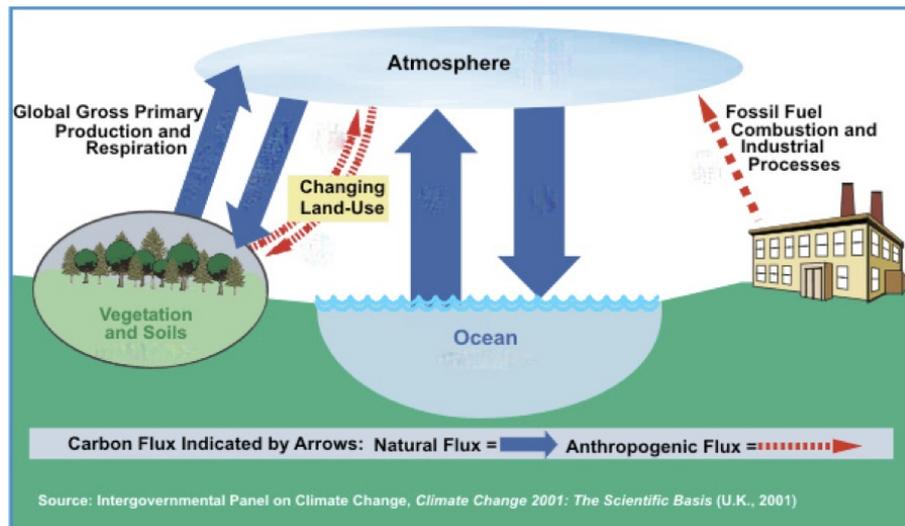


Figure 1. The greenhouse gas emission cycle

History

Industrial Revolution

Before the industrial revolution, the society was based on agriculture and handicraft economy, but the change soon came in the 18th century. Starting in Britain and spreading to the rest of the world, the industrial revolution shifted people's working environment to a machinery-based one. Among the new technologies that the industrial revolution brought, another important development that affected society was the incorporation of electricity and new energy sources into daily lives. Energy sources such as coal, the steam via the steam engine, petroleum, and the internal-combustion engine came into the public and were used to increase industrial efficiency. The implementation of electricity and energies ultimately led people to moving out of rural areas and into cities where populations increased significantly. While industrialization progressed society economically and socially, the sources of which energy was being created were producing emissions and polluting the earth.

The discovery of global warming

Before issues such as climate change and global warming occurred, people have long suspected that human activities can result in changes of environment. In 1896 the Swedish scientist Svante Arrhenius published his idea that by burning fossil fuels such as coal, the planet's average temperature will rise due to the CO₂ to Earth's atmosphere. During that time, however, the majority of scientists didn't accept Arrhenius' findings; it was not until the 1950s where more accurate scientific study techniques

and calculations were developed, that people believed that burning coal and other fossil fuels might indeed lead to the buildup of CO₂ in the atmosphere and bring warming.⁹

Developments in clean energy

The development of clean energy can date back to 200 BC, where waterwheels that used to raise water, full cloth, and grind grain were developed.¹⁰ As time progressed, the first windmill was developed in the 1590s in the Netherlands, and followed by the world's first solar energy system invented by French investor Augustin Mouchot in the 1860s. Technologies that supported the development of renewable energy improved throughout centuries, resulting in the accomplishment of more efficient but less popular ways to generate power.¹¹

Key Issues

Climate change

Climate change is the long-term change in weather and temperature of the environment. Climate change occurs naturally; however, since the industrial revolution began, climate change has been occurring at an abnormal rate because of human activities that interrupt the natural carbon cycle by emitting excess carbon dioxide CO₂ through practices such as burning fossil fuels. According to the report by NASA, in 2020, the globe reached its hottest year ever, in which the global temperature has risen more than two degrees Fahrenheit compared to the 1880s. While degrees doesn't sound like much, it is very significant especially in regards to the impacts that rise in temperature can have on icecaps and organisms with a slim niche. Nowadays, countries around the world are trying to emit less greenhouse gasses into the atmosphere by substituting their energy sources to sustainable energies; several countries planned to meet zero emissions in 2050. However other nations, especially underdeveloped ones or ones whose economy relies on fossil fuels, are reluctant to make the switch.

⁹ "The Discovery of Global Warming." Introduction – Summary, <https://history.aip.org/climate/summary.htm>.

¹⁰ "Waterwheel." Encyclopædia Britannica, Encyclopædia Britannica, Inc., www.britannica.com/technology/waterwheel-engineering.

¹¹ "The History of Renewable Energy: Where It All Began: Project Solar UK." Project Solar UK | The UK's No.1 Solar Company, 18 June 2018, <https://www.projectsolaruk.com/blog/history-renewable-energy-began/#:~:text=Renewable%20energy%20%E2%80%93%20defined%20as%20energy,mimic%20the%20workings%20behind%20hydropower>.

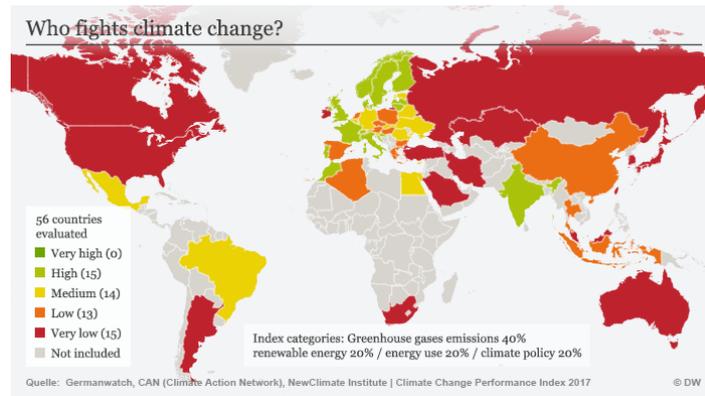


Figure 2. Countries that contributes to fight climate change in 2021

The unsustainability of Fossil Fuels

Fossil fuels are the remains of living organisms from millions of years ago which through time and pressure have formed into materials such as coal, crude oil, and natural gas. These materials are extracted from deep underground (the deeper and older they are, the more efficiently they create energy) and are burned. The heat they produce heats water which turns into steam that turns turbines connected to a generator that generates electricity. Humans are extracting fossil fuels faster than they are being created, and it is estimated that oil will run out by 2052, natural gas by 2060 and coal by 2090 (Octopus Energy Group). Renewable energies are the only alternative energy sources that will ensure sustainable development since it will not run out in the future.

Lack of Resources and Technologies

Nowadays, the renewable energies that are most commonly used in countries are solar energy, hydro energy, wind energy, and geothermal energy. However, in some countries, especially less developed countries (LDCs), renewable energies are hard to access and implement. The first reason is that the implementation of renewable energies is difficult for LDCs is that they require knowledgeable engineers to construct, which in some LDCs, lack of education is a big issue. The second reason is that their environment does not allow the implementation of renewable technologies. For example, in certain African countries, where there are few large water resources like rivers or lakes, hydro energy cannot be implemented. The third reason LDCs struggle to implement renewable energy is because renewables are expensive to install, and LDCs lack funding. The last reason is that some countries have several other humanitarian issues like war and tensions with neighboring countries which make implementing renewable technologies the least of their concerns.

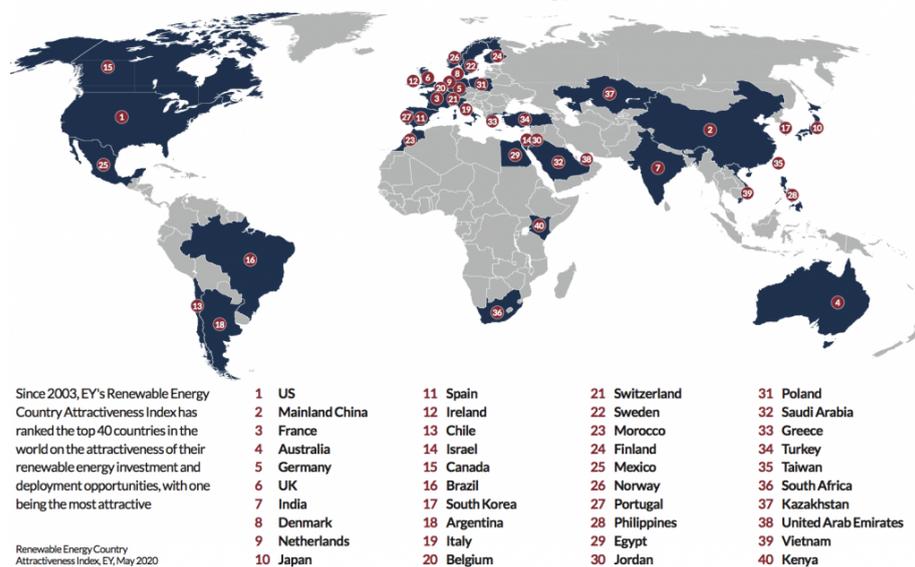


Figure 2. Countries' rank of investment in renewable energy

Harm of unsustainable energy

The use of fossil fuels to create energy has played a major role in the development of human society, however, it also causes detrimental effects on the environment. At the beginning of the industrial revolution, the effect of the fossil fuel industry on global temperatures was minimal, but their use has been harming the environment since the revolution.

First of all, fossil fuels have harmed the environment through land degradation which has damaged the balance of ecosystems, destroying mountains and forests. Secondly, water pollution is not only harming the ecosystem but also damaging people's health. Last but not least, emissions of carbon dioxide and harmful gasses are destroying the purity of the air, causing the increase of allergies and respiratory syndrome among human civilizations.

Profit for Economies

Fossil fuels are the natural resources hidden underground, and some countries are richer in fossil fuels than others. One of the main reasons why some countries refuse to transition towards the use of renewable energy is because they have structured their economy to mainly profit from their fossil fuel resources. The implementation of renewable energy and the removal of fossil fuel energies threatens the main source of income for many nations' economies.

The Limitations of and Controversy Around Nuclear Energy

While it is not considered renewable energy, it is important to note that nuclear energy is actually considered clean energy. In regards to sustainable development, nuclear energy is not a viable solution

as eventually, uranium reserves can run out. However since it is clean energy, it could serve as a temporary solution to climate change, and could be used in combination with renewables to a limited extent.

Major Parties Involved and Their Views

United Nations Development Programme (UNDP)

The UNDP is the UN's developmental agency that works in approximately 170 countries. Its purpose is to “eradicate poverty, reduce inequalities and exclusion, and build resilience so countries can sustain progress” (UN). One of the main missions of the UNDP is to help countries to achieve the 17 SDGs by 2030.

United Nations Sustainable Development Group (UNSDG)

UNSDG is a group that guides, supports, tracks and oversees the coordination of development operations in 162 countries and territories (UNSDG). Furthermore, 132 UN Country Teams implement the UNSDG strategic priorities, and have established 34 UN agencies, funds, and programmes to help achieve sustainable development.

United States of America (USA)

As one of the leading nations in the world, the USA consumed as much as 100 quadrillion British thermal units of electricity per year (EIA). However, the majority of energy consumed in the USA is non-renewable energy. Being one of the most developed countries in the world, the USA does have the technological capability and the estate necessary to construct and implement renewable energy, however their economy relies significantly on fossil fuels, and a majority of their energy source comes from nonrenewables.

European Union

The European Union is considered to be one of the world's leading unions in terms of the development of renewable energy. Within the union, there are countries like Sweden who aim to achieve 100% renewable energy on all energy sources in the coming years (Climate Council). Furthermore, nations like the rest of the Scandinavian countries, Germany, Holland, and others are working very hard to make clean energy their energy sources. The most important reasons why renewable energy is applicable in the European Union is due to its unique geographical location, as well as its financial capability. Countries in Europe often have large lakes that can provide hydropower, huge landscapes that allow the implementation of wind farms and solar farms, and comfortable temperatures that can

keep the technologies and the renewable energy under control. The EU is also extremely developed, and their economies are fully capable of investing in renewable energy.

China

China is the world's most populated country, and therefore it demands the most amount of energy use per day. In the past, China relied heavily on fossil fuel energy which has led to environmental damage, excess carbon-dioxide emission that pollutes the air, and harm to public health. However, in recent years, China has committed themselves to "move the country toward renewable energy to reduce energy consumption and cut the surging carbon dioxide emissions" (ScienceDirect Topics) by having a very significant percentage of its energy come from renewables.

Arab League

Being one of the greatest exporters and producers of oil, countries in the Arab Leagues often show resistance to the total investment towards 100% renewable energy. However, the attitude towards renewable energy slowly changed for some countries in these years. A recent report showed that the crown prince of Saudi-Arabia -- Mohammed bin Salman -- announced that "Saudi Arabia will generate 50% of its energy from renewables by 2030 and plant 10 billion trees in coming decades" (Climate change news). While this is a great feat, other members of the Arab League lag in taking initiative, primarily because of their heavy economic reliance on fossil fuels.

Russian Federation

The Russian Federation is rich in oil and gas. Approximately 60% of its exports are oil and gas , and 30% of Russia's GDP comes from oil and gas, making it difficult for the country to abandon this industry.

Being one of the largest countries geographically, Russia should have estate necessary to implement renewable energy. However, Russia has harsh environmental conditions such as extreme cold weather, lack of rivers, and tall mountains, which makes implementing facilities for renewable energy challenging. On top of the cruel environmental condition, citizens of Russia do not support the use of nuclear energy and often show reluctance to use them due to the Chernobyl disaster of 1986, when because of human error, the No 4. reactor in the Chernobyl Nuclear Power Plant (located in present-day Ukraine) exploded. This explosion resulted in at least 4,000 deaths, polluted Chernobyl making it uninhabitable, and exposed many to heavy radiation. Despite the fact that currently there are 38 nuclear power plants in Russia, citizens still show reluctance to the widespread use of nuclear energy.

The African Union (AU)

The African region collectively does not use significant renewable energy, especially when compared to Europe or China. Not only is there lack of renewables, but there is a lack of energy in general: there are approximately 500 million people in Africa that are living without electricity. As Africa continues to develop, countries must source electricity from clean sources such as solar power so that they can develop sustainably. However, this can be very difficult since many AU nations lack the capability to do so.

One of the factors that hinders the African Union to develop more renewable energy is their richness in natural resources. In regions like sub-Saharan Africa, where coal is rapidly being mined for exports and powerplants, it is hard to withdraw countries from non-renewable energy since their economies heavily rely on exporting non-renewable energy sources. In order to divert the African Union from non-renewable energy to renewable energy, introduction of other profitable products for the countries that cut back African Union's reliance on non-renewable energy is essential. One innovative way to do this would be to empower local rural communities with their own means of energy rather than relying on (in many cases, corrupt and incapable) governments to provide and maintain large-scale energy-provision operations to a widely dispersed population. While this is ambitious and would require extensive education and training of locals, it can be beneficial to them as the entire region as a whole.

Timeline of Relevant Resolutions, Treaties and Events

Date	Description of Event
1760~1840	The industrial revolution changed the working environment to machinery and technology based. This was the start of the use of non-renewable energy and the start of humans polluting the Earth.
November 22, 1965	The United Nations Development Programme was founded
June 3~14, 1992	The United Nations Conference on Environment and Development, also known as "Earth Summit", is a conference held in Rio de Janeiro, Brazil, from 3-14 June, 1992. The conference had representatives, NGOs, diplomats, leaders, and scientists represented from 179 countries to discuss how the environment is impacted by human activities. The main objective of the conference was to "produce a broad agenda and a new blueprint for international action on environmental and development issues that would help guide international cooperation and development policy in the twenty-first century" (UN). The "Earth Summit" ended with a conclusion that sustainable development is "an attainable goal for all the people of the world, regardless of whether they are at the local, national, regional or international level" (UN).
September, 2000	The United Nations Millennium Declaration commits world leaders to combat poverty, hunger, disease, illiteracy, environmental degradation, and discrimination against women. It was ratified in 2000 by almost 190 countries.

2015	A list of 17 sustainable development goals were established in the United Nations among member states and hope to achieve each goal in 2030.
April 22 2016	The Paris Agreement adopted by 196 Parties at COP 21, Paris is a legally binding international treaty on climate change.
September 21-23, 2019	The UN Climate Action Summit was held in the headquarter of UN in New York to increase pressure on political and economic actors to achieve the aims of the summit which were to pressure countries take extensive measures towards eliminating the use of fossil fuels.

Relevant UN Treaties and Events

- United Nations Framework Convention on Climate Change, 4–14 June 1992
- Promotion of new and renewable sources of energy, 20 March 2013 (A/RES/67/215)
- Sustainable Development Goals, 2015
- Open-source technologies for sustainable development, 30 July 2021 (E/RES/2021/30)
- Paris Agreement, 2016
- UN Climate Action Summit, 2019

Evaluation of Previous Attempts to Resolve the Issue

United Nations Framework Convention on Climate Change

The United Nations Framework Convention on Climate Change is a convention that aims to prevent human impact on the climate. The convention defines terms associated with climate change, pointing out why clean energy sources are essential for every nation, and countries that signed the convention need to follow the agenda of the convention by aiming to limit activities that cause climate change. However, this convention does not reinforce the implementation of clean energy, or provide any action plan for countries that want to start implementing clean energy.

Sustainable Development Goal

The United Nations Sustainable Development Goals are the 17 global goals set up in 2015 by the General Assembly that are designed to be a “blueprint to achieve a better and more sustainable future for all”. The 17 goals covered poverty, hunger, education, environment, equality, and efficient use of energy. Countries, local governments, and citizens of the world are supposed to make laws, adjustments, and improvements associated with the 17 goals in order to achieve all of these goals in

2030. Currently, we are behind in achieving several of the 17 SDGs, and greater initiative must be made by all nations to help achieve these goals by 2030.

Possible Solutions

1. A collective science exchange center to develop and exchange more cost-effective measures to implement renewable energies.
 - **Pros:** Governments will be able to share technologies and work collaboratively to find more suitable solutions in regards to implementing renewable energies; governments can also help each other so that nations who may not be as capable to experiment with renewables can receive consultation on how they can approach them .
 - **Cons:** Countries might have disagreements when it comes to developing more renewable energies' technology. Also, countries might not want to exchange their work with another as they may develop competitiveness to lead in renewables.
2. Empowering rural communities with private small-scale means of sourcing renewable energy.
 - **Pros:** Empowering local communities with their own small-scale solar panels, wind turbines, hydroelectric power plants, and other means of sourcing renewable energy no longer makes them reliant on their government to provide them a constant source of energy. This would be extremely beneficial in places like Africa and Asia, where the governments of these countries may not be as capable or as willing to provide energy to rural communities. Having communities source their own energy would make them more independent, empowering them to be in charge of their development rather than hindering it because their governments cannot provide them with the basic services necessary to develop.
 - **Cons:** Although a formidable solution in theory, it may not be a feasible or realistic one. In order for rural communities to have their own renewable energy technologies, they would need to loan the tech from companies or governments with the promise to repay them within a certain period of time. In addition, it is not guaranteed that the people of these communities will dedicate themselves to maintaining and operating the technologies. This risks a waste of investment by governments or companies and would not solve anything. In order for this solution to work, both the people of these communities and the companies/governments involved have to be dedicated to making it work as the risk of economic loss is significant, but the potential to succeed is immense.

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Appendix or Appendices

- I. Learn more about sustainable development goals <https://sdgs.un.org/goals>
- II. Learn more about renewable energy
<https://www.nrdc.org/stories/renewable-energy-clean-facts>

To end with a very important note: plagiarism will NOT be tolerated at TAIMUN, and can lead to serious repercussions.