



IEA
COMMITTEE GUIDE

HORIZONS V

Director's Letter

Dear Delegates,

My name is Daniel Zhang, and it is my utmost pleasure to serve as the Director of the International Energy Agency (IEA) for Horizons 2024. Serving on the Dais team alongside me are Tyler Sun and Annalise Politis, your Chairs. Together, we would like to welcome you with warm regards to Horizons 2023.

Going into my Senior year at Mount Douglas Secondary School, I have been enthralled in Model UN for the past 3 years. Although, like many others, I walked into my first conference filled with scepticism, I soon found myself mesmerised by the eloquent speeches and laughing alongside the delegates at the bizarre crisis scenarios. To new delegates, I can only imagine that you may be feeling how I had, and I urge you to immerse yourself in the fruitful debate and step out of your comfort zone into the world of Model UN. To veteran delegates, continue exploring your passions and dive further into this practice of diplomacy.

The importance and relevance of the topic being explored—Expanding Clean Energy Investment—cannot be understated. With the ever persistent issue of climate change, alongside the recent reminder of the precarious nature of our energy market, the transition to clean energy is a multifaceted and evolving issue. I encourage you to approach this topic with an open view and conduct fruitful debate and diplomacy during the conference.

I, along with the rest of the Dais team wishes you luck in preparation for Horizons 2023 and look forward to meeting you. If you have any questions or concerns, please do not hesitate to contact me at horizons-iaa@cahsmun.org.

Sincerely,

Daniel Zhang
Director of International Energy Agency
CAHSMUN Horizons 2023

Committee Description

The International Energy Agency (IEA) was founded on November 18, 1974, as a response to the 1973 Oil Crisis. This crisis resulted from the oil embargo imposed on the United States (US) by Arab members of the Organization of Petroleum Exporting Countries (OPEC) in response to US support for Israel during the Yom Kippur War.¹ At the time, oil reigned as the primary source of energy generation, and the widespread economic distress that followed highlighted the importance of a stable source of petroleum and the political leverage wielded by oil-rich nations.² Therefore, the IEA's original mandate was on “energy security and other questions of energy policy cooperation among member countries” (IEA) with a particular focus on preventing disruptions to oil supplies.³ However, as the IEA developed, it eventually expanded into an organization that aimed for “energy security, economic development, environmental awareness, and engagement worldwide” (IEA).⁴

The IEA is an autonomous organ under the framework of the Organization for Economic Cooperation and Development (OECD) and is not directly associated with the United Nations (UN).⁵ Its primary functions revolve around offering policy recommendations and providing pertinent statistics on the energy sector for its member states.⁶ Moreover, the IEA serves as a platform for nations to collaborate on future energy and environmental objectives, a role that has seen it significantly influence humanity's energy consumption patterns.⁷ The Agency is made up of a collection of member and associate countries, where member nations are held to several requirements such as reductions in oil consumption and providing of transparent reports.⁸ Internally, decisions on the agency's goals and direction are made through the IEA's Governing Board.⁹ Within Governing Board meetings, passing a vote generally calls for a unanimous decision unless otherwise specified, as the decisions are legally binding to all IEA member countries.¹⁰

Originally, the IEA was composed of 17 countries, namely Austria, Belgium, Canada, Denmark, Germany, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States.¹¹ However, the

¹ <https://www.google.com/search?client=firefox-b-d&q=what+happened+1973+oil+crisis>

² <https://www.eia.gov/energyexplained/oil-and-petroleum-products/use-of-oil.php>

³ <https://www.iea.org/media/about/1ieahistory.pdf>

⁴ <https://www.iea.org/about/>

⁵ https://en.wikipedia.org/wiki/International_Energy_Agency

⁶ <https://www.investopedia.com/terms/i/international-energy-agency.asp>

⁷ <https://www.iea.org/energy-system/electricity#tracking>

⁸ <https://www.iea.org/about/membership>

⁹ <https://www.iea.org/about/structure>

¹⁰ Ibid.

¹¹ <https://www.iea.org/about/history>

IEA has expanded to 31 members today.¹² All IEA member states must meet a criteria on energy conduct which includes possessing sufficient oil reserves and pledging to decrease national oil consumption.¹³ In addition to its member states, the IEA also works with 13 “Association Nations” that do not fully meet the criteria, comprising Brazil, China, India, Indonesia, Morocco, Singapore, and Thailand.¹⁴ The IEA frequently collaborates with these association nations on joint programmes and policy recommendations. Furthermore, the IEA cooperates with entities such as the EU and many other countries that do not have member status.¹⁵ This network within the international community enables the IEA to effectively conduct its duties on ensuring future energy stability and sustainability.

Topic Overview

In recent years, the international community has acknowledged global warming – the rise in global temperature due to greenhouse gases – as a major threat to human prosperity, and various goals have been set to limit global warming.¹⁶ Yet, an overwhelming majority of the world’s energy demands are still being fulfilled by fossil fuels, energy sources known for producing greenhouse gases.¹⁷ In 2020, only 29% of the world’s total energy consumption came from renewable sources, with developing nations notably lacking in renewable energy sources.¹⁸ Therefore, expanding renewable energy investments in developing countries is crucial to fulfilling global climate goals.

In its 2017 “World Energy Outlook,” the International Energy Agency (IEA) predicted a 30% percent increase in energy demand by 2040.¹⁹ This increase in demand mainly comes from developing countries, due to a combination of rapid urbanization and dramatic population growth.²⁰ Urbanisation specifically has given rise to widespread consumer culture and encouraged industrial growth, thus resulting in the rapid growth of the industrial and transportation sector’s energy demand.²¹ Countries such as China, India, and other countries in Southeast Asia are projected to account for over two-thirds of this increased energy demand, and the remaining third will come from developing countries in the Middle East and Africa.²² To fulfil this demand, trillions of dollars will need to be

¹² Ibid.

¹³ <https://www.iea.org/countries/membercountries/>

¹⁴ <https://www.iea.org/countries>

¹⁵ <https://www.iea.org/>

¹⁶ <https://unfccc.int/process-and-meetings/the-paris-agreement>

¹⁷ <https://data.worldbank.org/indicator/EG.FEC.RNEW.ZS>

¹⁸ Ibid.

¹⁹ <https://www.iea.org/weo2017/>

²⁰ <https://impakter.com/energy-consumption-in-the-developing-world-by-2040-implications-and-goals/>

²¹ Ibid.

²² <https://www.iea.org/reports/world-energy-outlook-2022/executive-summary>

invested into global energy infrastructure projects to ensure a safe and sustainable energy system for the globe.²³ However, aside from unique examples such as China, many developing nations lack the funds and infrastructure to meet their energy demands. In these cases, foreign investors will play a pivotal role.²⁴

The growth of renewable energy capacity in developing nations also constitutes a key part of energy security. The IEA defines energy security as “the uninterrupted availability of energy sources at an affordable price.”²⁵ Traditionally, energy resources such as oil, coal, and natural gas rely on international supply chains, making them susceptible to supply disruptions and geopolitical exploitation.²⁶ Oftentimes, dependency on fossil fuels leads to an overreliance on foreign nations for energy rather than focusing on developing domestic energy infrastructure.²⁷ Currently, many developing countries already suffer from this as they rely on oil-rich countries to provide the fossil fuel necessary for their power generation.²⁸ Such overdependence will cause nations to lose the ability to maintain their national energy infrastructure should conflict erupt with their suppliers.²⁹ Furthermore, the issue of not having jurisdiction over their own energy sources may cause an unfavourable power dynamic.³⁰ Comparatively, with the introduction of renewable energy sources such as wind and solar, developing nations will no longer be bound by their energy constraints, due to the versatile nature of renewable infrastructure and its independence from local geological sources.³¹ These factors will allow nations to achieve greater energy security and national sovereignty.³² However, despite these benefits, renewable energy sources are not without flaws, as the considerable price jump in initial cost and the relatively low efficiency have been points of major concern.³³ Therefore, delegates must thoroughly evaluate and weigh the advantages and disadvantages of renewable energy and the complex factors involved in the process.

²³ <https://www.iea.org/reports/world-energy-investment-2022/overview-and-key-findings>

²⁴ Ibid.

²⁵ <https://www.iea.org/topics/energysecurity/>

²⁶ www.forbes.com/sites/rpapier/2020/07/19/global-coal-consumption-is-being-driven-by-developing-countries/?sh=5aa6d53d1c4f.

²⁷ Ibid.

²⁸ Ibid.

²⁹ Ibid.

³⁰ Ibid.

³¹ <https://www.nrdc.org/bio/john-bowman/clean-energy-key-real-energy-independence>

³² Ibid.

³³ <https://www.conserve-energy-future.com/advantages-and-disadvantages-of-renewable-energy.php>

Timeline

June 27, 1954 – The first nuclear reactor for commercial use is established in the Soviet Union, providing an alternate energy source for the future.³⁴

September 10, 1960 – The Baghdad Conference takes place during a period of change in the international economic landscape that resulted in the formation of OPEC, an intergovernmental organization made up of key players in the global oil market, including Iran, Iraq, Kuwait, Saudi Arabia and Venezuela.³⁵

October, 1973 – In response to the United States and its allies supporting Israel during the Yom Kippur War, OPEC imposes an oil embargo against pro-Israel states.³⁶ The embargo quadrupled oil prices in affected countries and brought energy security into the spotlight of international politics.³⁷

November 18, 1974 – The IEA is created in the wake of the 1973 oil crisis.³⁸

January 7, 1978 – Iranian oil production is disrupted due to the Iranian Revolution. Fearing insufficient oil supplies, global panic ensues, and oil prices skyrocket.³⁹ This event convinces governments to invest enormous funds into developing energy alternatives.⁴⁰

1980 – The first commercial wind farm is constructed in New Hampshire, United States.⁴¹

May 9, 1992 – The United Nations Framework Convention on Climate Change (UNFCCC) is adopted.⁴² The treaty focuses on stabilising greenhouse gas levels in the Earth's atmosphere.⁴³

³⁴ https://www.energy.gov/sites/prod/files/The%20History%20of%20Nuclear%20Energy_0.pdf

³⁵ https://www.opec.org/opec_web/en/about_us/24.htm

³⁶ <https://history.state.gov/milestones/1969-1976/oil-embargo>

³⁷ <https://history.state.gov/milestones/1969-1976/oil-embargo>

³⁸ <https://www.iea.org/about/history>

³⁹ <https://www.brookings.edu/articles/what-irans-1979-revolution-meant-for-us-and-global-oil-markets/>

⁴⁰ <https://www.brookings.edu/articles/what-irans-1979-revolution-meant-for-us-and-global-oil-markets/>

⁴¹ <https://www.energy.gov/eere/wind/history-us-wind-energy>

⁴² <https://unfccc.int/process-and-meetings/what-is-the-united-nations-framework-convention-on-climate-change>

⁴³ Ibid.

December 11, 1997 – As a continuation of UNFCCC, the Kyoto Protocol is adopted by the United Nations.⁴⁴ The protocol recognizes that global warming is linked to human activity and is a likely cause of climate change. In addition, the protocol calls for sustainable development and recognizes fossil fuels as the central issue.⁴⁵

December, 2010 – The Green Climate Fund (GCF) is created within the framework of UNFCCC in order to provide financial support for sustainable developments in developing countries through grants or loans.⁴⁶

2015 – The growth of renewable energy sources exceeds that of fossil fuels for the first time.⁴⁷

September 25, 2015 – The United Nations implements Sustainable Development Goals (SDGs) under resolution 70/1 (A/RES/70/1) and aims to achieve them by 2030.⁴⁸ Goal 7 focuses on global “access to affordable, reliable, sustainable, and modern energy.”⁴⁹

November 4, 2016 – The Paris Climate Agreement comes into effect.⁵⁰ The agreement focuses on the reduction of greenhouse emissions in order to curb global warming.

September 23, 2019 – The Climate Action Summit takes place in New York, where nations discuss necessary commitments to increasing clean energy and climate awareness in order to reduce global warming.⁵¹

September 24, 2021 – In the High-level Energy Dialogue, over 130 world leaders meet to discuss clean energy alternatives and technological innovations within the energy sector.⁵² The summit results in the creation of the first global roadmap to transition into clean energy and increase energy accessibility.⁵³

⁴⁴ https://unfccc.int/kyoto_protocol

⁴⁵ Ibid.

⁴⁶ <https://www.greenclimate.fund/>

⁴⁷ <https://www.iea.org/news/renewable-electricity-growth-is-accelerating-faster-than-ever-worldwide-supporting-the-emergence-of-the-new-global-energy-economy>

⁴⁸ <https://sdgs.un.org/goals>

⁴⁹ Ibid.

⁵⁰ <https://unfccc.int/process-and-meetings/the-paris-agreement>

⁵¹ <https://www.un.org/en/climatechange/2019-climate-action-summit>

⁵² <https://www.un.org/en/conferences/energy2021>

⁵³ Ibid.

February 24, 2022 – Russia begins the Russo-Ukrainian War through an invasion of Ukraine, resulting in rising energy prices and highlighting the volatility of fossil fuel dependence.⁵⁴

August 18, 2022 – An updated annual study shows that global warming has resulted in Antarctic sea ice reaching its lowest extent since records began.⁵⁵

May 25, 2023 – An article released by the IEA demonstrates that global investment in clean energy is set to reach 2.3 trillion CAD by the end of 2023.⁵⁶

Historical Analysis

During the rapid industrialization and consumer culture that followed the end of World War II, nations relied primarily on fossil fuels in order to fulfil their energy demands. These fossil fuels include coal, natural gas, and oil, with oil in particular being the primary fuel source entering into the 20th century. With the growth of oil demand, many countries found that their domestic petroleum production could not meet their needs and began importing oil from oil-rich countries, notably those in the Middle East and the Soviet Union.⁵⁷ As a result, certain nations, such as those in the Middle East, gained control of the global oil supply and the Organization of the Petroleum Exporting Countries (OPEC) was formed by oil-producing nations to bolster their influence on oil prices.⁵⁸

During the mid-1900s, fossil fuels were viewed to be an endless source of cheap and reliable energy.⁵⁹ This perception caused a lack of attention on energy conservation and security, with fossil fuels often being wasted and unregulated.⁶⁰ A majority of countries “permitted [the] excessive and even wasteful and inefficient use of energy,” (IEA) looking little into alternative energy sources.⁶¹ Global warming was not yet considered a valid issue by many until the late 1980s, meaning the world did not feel required to reconsider fossil

⁵⁴ <https://www.iea.org/topics/russias-war-on-ukraine>

⁵⁵ <https://www.un.org/en/climatechange/reports>

⁵⁶ <https://www.iea.org/news/clean-energy-investment-is-extending-its-lead-over-fossil-fuels-boosted-by-energy-security-strengths>

⁵⁷ <https://www.cfr.org/timeline/oil-dependence-and-us-foreign-policy>

⁵⁸ https://www.opec.org/opec_web/en/about_us/24.htm

⁵⁹ <https://www.iea.org/about/history/>

⁶⁰ https://link.springer.com/referenceworkentry/10.1007/978-3-319-95864-4_88

⁶¹ <https://www.iea.org/about/history/>

fuels. This over dependence on fossil fuels made the ensuing oil crises of the 1970s devastating to oil importing nations across the globe.^{62 63}

October 6th, 1973 marked the outbreak of the Yom Kippur War. The war was started by a coalition of Arab nations, which marched into Israeli territory with the objective to reclaim lost territory from the Six Day War in 1967. As Israel was an important ally to the United States in the Middle East, Richard Nixon authorised supply airlifts for Israel on October 12, 1973 in order to support their war effort. This action angered Saudi Arabia and its allies, leading to economic retaliation through oil.⁶⁴ Arab members of OPEC, including Saudi Arabia, Egypt and Syria, imposed an embargo on many Western powers. This act of economic aggression marked the first instance of oil being wielded as a political weapon.⁶⁵

The oil embargo shattered the belief that fossil fuels can be a constant, reliable, and cheap energy source, causing many of those affected to begin looking into alternative domestic energy sources that are more stable.⁶⁶ Nations affected by the embargo, including Canada, Japan, the Netherlands, the United Kingdom, and the United States, observed that oil prices per barrel “first doubled, then quadrupled,” (U.S. Department of State) jumping from 4 CAD per barrel to over 16 CAD per barrel by the end of the embargo in March 1974.⁶⁷ This abrupt disruption to oil supplies plunged the global economy into a recession, signifying the conclusion of the post-World War 2 economic boom.⁶⁸ For the first time, nations realized the importance of energy security and how over-reliance on fossil fuels can jeopardize their political freedom and prosperity.

In the aftermath of the embargo, the IEA was created to prevent and act as a safeguard against future supply disruptions. The period also saw some of the first instances of nations looking seriously into renewable energy.⁶⁹ For example, President Nixon launched Project Independence in 1973, which aimed to achieve American energy independence through “science, technology, and industry.” Although it included measures to conserve energy, it mainly focused on nuclear power as a method to achieve energy independence and led to government policies that greatly expedited the development of nuclear power. Alongside increased investments in nuclear energy, in the 1970s, the United States reorganized the structure of the energy sector with the Energy Reorganisation Act of 1974. One of the

⁶² <https://www.iea.org/news/world-energy-outlook-2022-shows-the-global-energy-crisis-can-be-a-historic-turning-point-towards-a-cleaner-and-more-secure-future>

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⁶⁴ <https://www.npr.org/2022/10/13/1128523146/saudi-arabia-russia-opec-oil-cut-biden-congress-washington>

⁶⁵ <https://www.britannica.com/event/Arab-oil-embargo>

⁶⁶ <https://history.state.gov/milestones/1969-1976/oil-embargo>

⁶⁷ <https://history.state.gov/milestones/1969-1976/oil-embargo>

⁶⁸ <https://www.imf.org/en/Blogs/Articles/2022/07/26/blog-weo-update-july-2022>

⁶⁹ <https://www.iea.org/about/history>

agencies that eventually resulted from this reorganization was the Solar Energy Research Institute, now known as the National Renewable Energy Laboratory (NREL).

The NREL played a major role in the development and proliferation of renewable technologies through its focus on its research and development aspects. Although the NREL is federally owned and funded, it is operated by private entities which provide additional support. This relationship between the government and the private sector helped facilitate the transition of experimental technologies into the private sector for practical application.⁷⁰ It is likely that the unique structure and abundant resources dedicated to the NREL led to or expedited the creation of many modern-day wind and solar technologies.⁷¹

Climate Change

Despite the NREL being at the forefront of solar and wind energy advancement, many of these technologies in the 1980s were still not economically viable. However, during that time, rising levels of greenhouse gases and global warming caused climate movements, which brought renewed interest in renewable energy.⁷² In 1992, the United Nations Framework Convention on Climate Change (UNFCCC) held an “earth summit,” summoning over 100 heads of state to address “urgent problems of environmental protection and socio-economic development” (UN).⁷³ This conference led to the creation of Agenda 21, a non-binding agreement for countries to work towards sustainable development.⁷⁴ The conversation and contents of Agenda 21 began a series of dialogues on the climate issue that eventually culminated in the Kyoto Protocols and the Paris Agreement.⁷⁵

In accordance with Agenda 21, in 1997, nations convened again in Kyoto, Japan, to discuss and decide on international climate goals.⁷⁶ This congregation of countries led to the signing of the Kyoto Protocols, a monumental treaty that allowed for the rapid growth of renewable energy. The treaty officially recognized global warming and identified human activity to be the cause of climate change.⁷⁷ The treaty also outlined several goals and resulted in numerous programs put forth to reach said goals. Furthermore, the treaty imposed “internationally binding emission reduction targets.” (UN)⁷⁸ These emissions targets, coupled with the gradual reduction of renewable technology costs since the 1980s,

⁷⁰ <https://www.nrel.gov/wind/>

⁷¹ Ibid.

⁷² <https://www.iea.org/news/renewable-electricity-growth-is-accelerating-faster-than-ever-worldwide-supporting-the-emergence-of-the-new-global-energy-economy>

⁷³ <http://www.un.org/geninfo/bp/enviro.html>

⁷⁴ <https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>

⁷⁵ <https://www.iisd.org/mission-and-goals/sustainable-development>

⁷⁶ <https://sustainabledevelopment.un.org/outcomedocuments/agenda21>

⁷⁷ <https://unfccc.int/process-and-meetings/the-paris-agreement>

⁷⁸ <https://unfccc.int/process/the-kyoto-protocol>

allowed sustainable energy to take on the meteoric rise still witnessed today.⁷⁹ However, the Kyoto Protocols did not incentivize nations to follow the emission targets and lacked the necessary enforcement measures to ensure international compliance.⁸⁰ This caused the protocol to largely fail in achieving a reduction in emissions as developing nations, in particular, viewed the emission reductions as unfair given the unlikely economical alternatives.⁸¹

In 2015, the international community met again in Paris, France, to review and restructure emission reduction targets.⁸² The agreement became known as the Paris Agreement, the first legally binding international treaty on climate change, which set global emission targets and established clear responsibilities for each member state.⁸³ Compared to the Kyoto Protocols, the Paris Agreement provides an international framework for nations to receive economic and social support to achieve these goals.⁸⁴ Since the agreement came into effect in 2016, nations have submitted their national climate action plans to ensure compliance.⁸⁵

Nuclear Energy

Unlike other forms of renewable energy that continued to grow at incredible rates into the 21st century, nuclear power progress seems to have plateaued since the 1990s and has since even begun to decline.⁸⁶ ⁸⁷ Nevertheless, nuclear power remains a valuable energy source, generating large amounts of energy and being relatively accessible.⁸⁸ Furthermore, nuclear power plants produce almost zero carbon dioxide, making them an excellent renewable energy source.⁸⁹ Coupled with the fact that nuclear technology has been used since 1951 when an experimental nuclear reactor succeeded in powering consumer electronics, nuclear energy was one of the oldest renewable energy sources.⁹⁰ Therefore, nuclear energy became commercially viable at a time when other sources of renewable energy, such as wind and solar, were still in their infancy.

⁷⁹ <https://www.iaea.org/news/renewable-electricity-growth-is-accelerating-faster-than-ever-worldwide-supporting-the-emergence-of-the-new-global-energy-economy>

⁸⁰ <https://www.dw.com/en/kyoto-protocol-climate-treaty/a-52375473>

⁸¹ Ibid.

⁸² Ibid.

⁸³ <https://unfccc.int/process-and-meetings/the-paris-agreement>

⁸⁴ Ibid.

⁸⁵ Ibid.

⁸⁶ <https://www.worldfinance.com/markets/nuclear-power-continues-its-decline-as-renewable-alternatives-steam-ahead>

⁸⁷ <https://www.iaea.org/news/renewable-power-s-growth-is-being-turbocharged-as-countries-look-to-strengthen-energy-security>

⁸⁸ <https://newlaborforum.cuny.edu/2020/10/21/the-importance-of-nuclear-power-in-our-energy-mix/>

⁸⁹ <https://www.energy.gov/ne/articles/3-reasons-why-nuclear-clean-and-sustainable>

⁹⁰ https://www.energy.gov/sites/prod/files/The%20History%20of%20Nuclear%20Energy_0.pdf

After the 1973 oil crisis, the United States accelerated its nuclear generation capacity, an action also conducted by other nations.⁹¹ For example, most of France's electricity before the crisis relied on foreign imports of fossil fuels.⁹² Recognizing the threat to its energy security, French Prime Minister Pierre Messmer announced "The Messmer Plan" in 1974, aiming to generate most of France's energy needs through nuclear power.⁹³ Originally, the plan envisioned 80 nuclear plants to be built by 1985, and an additional 90 built by 2000.⁹⁴ However, this ambitious plan was never achieved due to unforeseen issues and complications with resources, funds, and political opposition.⁹⁵ Today, France operates 56 nuclear reactors, accounting for around 76.3 percent of the country's power generation and approximately 40 percent of its energy demands.⁹⁶

However, despite the apparent benefits of nuclear energy, there are many concerns and dangers associated with the technology. The risk of meltdown and issues with nuclear waste have been demonstrated throughout history.⁹⁷ The most prominent example is the Chernobyl nuclear meltdown in 1986. Due to a combination of human error, poor reactor design, and non-compliance with safety regulations, reactor number four of the Chernobyl power plant had a meltdown, which released "between 50 and 185 million curies of radionuclides," (Britannica) meaning its radioactivity was more than that created by the atomic bombs dropped on Hiroshima and Nagasaki.⁹⁸ The radioactive material reached areas as far as France and Italy, and it is estimated to have caused thousands of cancer-related deaths in the long term.⁹⁹ Other long-term effects include environmental damage such as increased levels of cataracts and lower rates of beneficial bacteria within wildlife in the area.¹⁰⁰ This result was mainly due to the poor pre-disaster and post-disaster management at the time, and, following the disaster, international regulation on nuclear power was strengthened.¹⁰¹ A more modern example was the Fukushima nuclear reactor meltdown on March 11, 2011, the most catastrophic nuclear-related accident since Chernobyl.¹⁰² As a result of the most powerful earthquake and tsunami ever recorded in Japan, the diesel generators of the Fukushima reactor were damaged, resulting in the loss

⁹¹ <https://world-nuclear.org/information-library/country-profiles/countries-t-z/usa-nuclear-power.aspx>

⁹² <https://www.iea.org/countries/france>

⁹³ <https://academic.oup.com/book/40983/chapter-abstract/349206275?redirectedFrom=fulltext>

⁹⁴ <https://world-nuclear.org/information-library/current-and-future-generation/outline-history-of-nuclear-energy.aspx>

⁹⁵ <https://hbr.org/2005/10/the-hard-side-of-change-management>

⁹⁶ <https://www.eia.gov/todayinenergy/detail.php?id=55259>

⁹⁷ <https://world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-wastes/radioactive-wastes-myths-and-realities.aspx>

⁹⁸ <https://www.britannica.com/event/Chernobyl-disaster>

⁹⁹ <https://www.britannica.com/event/Chernobyl-disaster>

¹⁰⁰ <https://www.nationalgeographic.co.uk/environment/2019/05/chernobyl-disaster-what-happened-and-long-term-impact>

¹⁰¹ <https://www.preventionweb.net/understanding-disaster-risk/risk-drivers/poverty-inequality>

¹⁰² <https://world-nuclear.org/nuclear-essentials/what-are-the-effects-of-nuclear-accidents.aspx>

of reactor core cooling and three nuclear meltdowns.¹⁰³ The incident's location near the sea caused much of the nuclear material to be swept into the ocean, leading to environmental damage such as the loss of habitable land and spikes in cesium levels within ocean life that would scar the globe for years.¹⁰⁴ Fortunately, due to safety protocols and prompt response, little to no health defects were seen among the population.¹⁰⁵

Despite these catastrophes, much of the global population is still firm in their support of nuclear power, with recent polling showing that support for nuclear power is growing within the EU.¹⁰⁶ This is a pattern mirrored across much of the international community, including China, the United States, and Canada. Past accidents have also aided in advancing the development of multi-factor safety protocols, reactor designs and operation procedures, ensuring that such mistakes are not repeated: providing comfort and security to the residents and making civilians more accepting of nuclear energy.¹⁰⁷

However, since 2015, the amount of power generated by nuclear power has been in decline, especially within the Western market.¹⁰⁸ There are many factors that could cause this decline in nuclear energy's role in the global energy market, with concerns over cost and maintenance being especially significant. Constructing nuclear infrastructure often entails high costs as the volatile market comes without long-term market regulation.¹⁰⁹ These issues have caused investors to avoid making further nuclear energy investments in favour of more stable energy markets.¹¹⁰ Alongside skepticism around the safety of nuclear reactors, a decline in nuclear energy has been seen —especially in the United States.¹¹¹ Despite this, nuclear energy remains a valuable solution for a clean energy source due to its much higher efficiency and relative stability. With time and market stability, the nuclear market will show its value to investors.¹¹²

¹⁰³ <https://world-nuclear.org/information-library/safety-and-security/safety-of-plants/fukushima-daiichi-accident.aspx>

¹⁰⁴ <https://ohiostate.pressbooks.pub/sciencebites/chapter/dispersion-of-radioactive-material-from-the-fukushima-daiichi-disaster/>

¹⁰⁵ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7577680/>

¹⁰⁶ <https://world-nuclear.org/information-library/current-and-future-generation/nuclear-power-in-the-world-today.aspx>

¹⁰⁷ <https://world-nuclear.org/information-library/safety-and-security/safety-of-plants/safety-of-nuclear-power-reactors.aspx>

¹⁰⁸ <https://world-nuclear.org/information-library/current-and-future-generation/nuclear-power-in-the-world-today.aspx>

¹⁰⁹ <https://www.brinknews.com/nuclear-power-is-declining-in-the-west-and-growing-in-developing-countries/>

¹¹⁰ <https://www.iea.org/reports/nuclear-power-in-a-clean-energy-system>

¹¹¹ <https://world-nuclear.org/information-library/safety-and-security/safety-of-plants/safety-of-nuclear-power-reactors.aspx>

¹¹² <https://world-nuclear.org/information-library/economic-aspects/economics-of-nuclear-power.aspx>

Current Situation

Currently, renewable energy is the fastest-growing energy source in the world.¹¹³ In 2023 alone, the global capacity of renewable energy is projected to grow by 440 gigawatts and is set to amount to 50% growth by 2026, far surpassing the growth of the fossil fuel industry.¹¹⁴ However, despite this growth, fossil fuels still make up a majority of the world's energy consumption, as 80% of the world's current energy still relies on fossil fuels.¹¹⁵ This progress in renewable energy sources has been primarily concentrated in major economic powers, which have the necessary resources to invest in modern technologies. For example, in pursuit of its emissions targets, China experienced the largest increase in renewable energy, encompassing over 40% of all renewable energy growth.¹¹⁶ Furthermore, India has also heavily invested in renewable energy; it is estimated that wind and solar power represent 90% of power capacity growth in India.¹¹⁷ This growth is further propelled by increasing economic incentives to use renewable energy sources. The increasing costs of operating fossil fuel power plants due to carbon taxation and the decreasing costs of producing renewable power systems, such as Solar Photovoltaic (PV) systems, have helped make renewable energy sources more appealing to investors. Additionally, increased funding for research and development has seen the price of renewable energy sources drop rapidly, making them more accessible and convenient. However, despite the optimistic indicators, there continue to be concerning trends in renewable energy investments.

Declining Investment

Although renewable energy is growing at an unprecedented rate, data shows that the amount of money invested in 2017 was 13% lower than its peak in 2015. There are many factors which account for this decrease. The first and most comforting factor is the decreasing infrastructure costs, allowing companies to construct bigger or more powerful renewable energy projects for the same or less money. For example, in 2009, PV systems cost around \$314 per megawatt-hour; however, in 2017, the cost of PV systems dropped to a mere \$86 per megawatt-hour, a 72% decrease in cost. Similarly, the cost of land-based wind power dropped by 27% in the same period.¹¹⁸ This decrease in capital costs plays a role in why less money is being invested in renewables.

¹¹³ <https://www.iea.org/news/renewable-power-on-course-to-shatter-more-records-as-countries-around-the-world-speed-up-deployment>

¹¹⁴ Ibid.

¹¹⁵ <https://www.eesi.org/topics/fossil-fuels/description>

¹¹⁶ <https://www.sciencedirect.com/science/article/pii/S2589004223003401>

¹¹⁷ <https://www.iea.org/reports/india-energy-outlook-2021>

¹¹⁸ <https://www.irena.org/publications/2018/jan/renewable-power-generation-costs-in-2017>

Many governments today are also shifting away from Feed-In Tariffs (FITs), which is another cause of the declining investment.¹¹⁹ FITs are government cash-backs for producers that generate renewable energy and return unused electricity back to the grid.¹²⁰ FITs were originally implemented by governments in order to encourage investors, and they were extremely effective.¹²¹ However, in recent years, FITs have been criticized for not incentivizing companies to cut costs, resulting in higher costs for consumers. As a result, many governments have begun to use “auction systems” instead, where the developer who offers to build a project for the lowest cost wins and gets awarded the contract. This system results in narrower profit margins for investors due to the loss of government support and the comparably harsher and more competitive nature of the system. Together, these elements expose the investor to further risks and diminish the incentives that once drove such projects, ultimately causing less investment in renewable energy.

Finally, interest rates around the globe are also rising.¹²² This rise in interest is for a variety of reasons including inflation and global economic instability due to events such as COVID-19. Higher interest rates discourage developers from taking out loans as the higher debt will inevitably increase risk and damage profit margins. Through a combination of these factors, the Frankfurt School of Finance summarises that we may be entering a new era where “solar and wind costs are lower, but financing is more difficult to get and more expensive” (Lucas Sendagorta).¹²³

Solar & Wind Power

Solar and wind power installations are considered two of the most promising forms of renewable energy. Modern developments for solar and wind power have made their costs to be equivalent to or lower than similarly productive coal and gas power plants. On average coal-fired plants cost 2.47 million CAD to operate per megawatt yield whereas solar farms cost just 1.2 million CAD.¹²⁴ ¹²⁵ In fact, in countries such as the United Arab Emirates (UAE), Mexico, and Chile, prices have dropped to as low as 3 cents per kilowatt-hour.¹²⁶ Therefore, solar and wind are some of the fastest-growing renewable energy sources. Moreover, most of the costs for solar and wind power plants mainly come from the

¹¹⁹ <https://www.investopedia.com/terms/f/feed-in-tariff.asp>

¹²⁰ Ibid.

¹²¹ Ibid.

¹²² <https://www.nytimes.com/interactive/2022/06/16/business/economy/global-interest-rate-increases.html>

¹²³ <https://repositorio.comillas.edu/rest/bitstreams/332126/retrieve>

¹²⁴ <https://esfccompany.com/en/articles/thermal-energy/coal-fired-power-plant-construction-costs/>

¹²⁵ <https://www.solarreviews.com/blog/what-is-a-solar-farm-do-i-need-one>

¹²⁶ <https://solarlove.org/latest-energy-auction-chile-sees-price-solar-fall-3-cents-per-kilowatt/>

initial purchase and construction of these installations, which can be cut down by streamlining the manufacturing and transportation processes. Solar and wind power plants are fairly cheap and easy to maintain compared to other sources of renewable energy, making them suitable for many developing nations that do not have the necessary resources for expensive maintenance operations.

One of the most prominent success stories of solar and wind power flourishing in developing nations is China –currently the world’s biggest carbon emitter.¹²⁷ Through aggressive policies and government-backed programs, China’s fossil fuel consumption peaked in 2013 and has been on a steady decline since.¹²⁸ This would not have been possible without the rise of cheap solar and wind plants which accounted for over 70 percent of its renewable energy.¹²⁹ Solar energy in particular was heavily encouraged by the government, resulting in its commercialization and installation in civilian housing. It demonstrates the viability of these technologies on a nationwide scale. However, solar and wind power are also severely limited by a nation’s climate and geography, with its effectiveness varying widely between nations. Therefore, this source of renewable energy has been mostly present in regions with the necessary climate to maximize its effectiveness.

Hydroelectric Power

Hydroelectric power is another renewable energy option and remains one of the most consistent energy sources that many nations rely on, with Canada being a prime example.¹³⁰ Hydroelectric power harnesses the kinetic energy of flowing water to generate electricity, a concept that has been harnessed for thousands of years in recorded history on a much smaller scale relative to modern standards.¹³¹ However, it wasn’t until the early 20th century that hydroelectric became a major player in global energy.¹³² Major accomplishments such as the Hoover Dam in the United States and the Three Gorges Dam in China have legitimized hydroelectric as a stable power source and provided confidence to investors, allowing hydroelectric to become much more widespread and mainstream across the world, making up almost 20% of the world's electricity generation.^{133, 134}

¹²⁷ <https://climateactiontracker.org/countries/china/>

¹²⁸ Ibid.

¹²⁹ Ibid.

¹³⁰ <https://www.energy.gov/eere/water/articles/study-finds-hydropower-provides-reliable-electricity-even-during-historic>

¹³¹ <https://www.energy.gov/eere/water/history-hydropower>

¹³² Ibid.

¹³³ Ibid.

¹³⁴ <https://www.iea.org/energy-system/renewables/hydroelectricity>

The benefits of hydroelectric power have been shown through its reliability, being consistent despite droughts while producing minimal greenhouse gases. Although its versatility is limited by geographical requirements, hydroelectricity produces an immense amount of energy, which can be stored as surplus, a benefit that makes it much more lucrative than other renewable energy sources.¹³⁵ However, often such hydroelectric projects can result in large-scale habitat disruption, biodiversity loss and displacement of communities.¹³⁶ Despite this, modern development and more environmentally conscious projects will allow hydroelectricity to transition towards a more sustainable and reliable source for nations around the globe.

UN/International Involvement

In recent years, the United Nations has developed a rhetoric of overwhelming support for expanding clean energy investments in developing countries. UN resolutions 62/197 (A/RES/62/197) and 60/1 (A/RES/60/1) have both called for the expansion of clean energy. In addition, international declarations including the Johannesburg Declaration on Sustainable Development, which drew international focus on worldwide development issues, demonstrated the dedication of the international community to develop renewable energy.¹³⁷

However, calls for expanding renewable energy investments have been a relatively recent event. The importance of renewable energy was not realized until the 1990s and the United Nations did not take significant action until the 2000s due to the lack of international consensus on issues such as global warming.¹³⁸ Because of this, past expansion of renewable investments in developing countries has been scarce. While plans have been put in place with the aim of attracting investments to developing countries, these plans often suffer from inefficiencies or have fallen short of their intended goals.¹³⁹ Despite this, the diplomatic nature of and the discussions that arise from these systems hold great potential and can serve as the foundation for future action.¹⁴⁰

¹³⁵ <https://www.iea.org/energy-system/renewables/hydroelectricity>

¹³⁶ Ibid.

¹³⁷ <https://press.un.org/en/2002/envdev704.doc.htm>

¹³⁸ <https://www.un.org/en/chronicle/article/stockholm-kyoto-brief-history-climate-change>

¹³⁹ <https://www.oecd.org/investment/investmentfordevelopment/1959815.pdf>

¹⁴⁰ Ibid.

Kyoto Protocol

As previously mentioned, the Kyoto Protocol was a monumental step towards the recognition of climate change and the importance of renewable technologies. The protocol implemented several mechanisms intended to expand investments in renewable energy to developing nations.¹⁴¹ One such mechanism was the Clean Development Mechanism (CDM). The CDM was a credit system that linked investments in renewable projects in developing countries to a specific emission reduction target for the investing nation. As the majority of historical emissions come from developed nations, they can amend it by assisting developing nations and investing in renewable energy infrastructure.¹⁴² For every renewable project implemented, the investor nation will receive a certain amount of Certified Emission Reduction (CER) credits. One CER is equivalent to one ton of carbon dioxide gas, and these credits can be used towards meeting the emissions targets set for each nation.¹⁴³ As of 2020, the impact of these credits amounted to 2.4 billion tonnes of CO₂ reduced from the air.¹⁴⁴ Despite this progress, however, it still falls short of the goals set out.¹⁴⁵

Although CER credits have the potential to spark renewable development, its biggest challenge is the lack of involvement and incentive from economically dominant nations. Despite being the second largest carbon dioxide producer in the world, the U.S., for example, did not ratify the Kyoto Accord and has no quota to fulfil; hence, the U.S. does not invest in CER projects.¹⁴⁶ Other major carbon dioxide producers such as China and India are classified as developing nations; therefore, they have no emission quotas placed upon them.¹⁴⁷ Because of this, China and India are recipients of funds used to purchase CER credits, yet do not act to obtain the credits themselves due to the lack of incentive without an implemented emissions quota.¹⁴⁸ Therefore, the supply of CER credits vastly overshadows its demand and, in combination with the lack of incentive, reduces the overall effectiveness of the program.¹⁴⁹ If CERs are to be reformed for the future, increased participation and more aggressive emissions targets need to be set to create a stable market for the credits.¹⁵⁰

¹⁴¹ https://unfccc.int/kyoto_protocol

¹⁴² Ibid.

¹⁴³ <https://www.cer-rec.gc.ca/en/data-analysis/canada-energy-future/2023/scenarios-and-assumptions/>

¹⁴⁴ <https://journals.plos.org/climate/article?id=10.1371/journal.pclm.0000046>

¹⁴⁵ https://unfccc.int/kyoto_protocol

¹⁴⁶ https://en.wikipedia.org/wiki/Kyoto_Protocol

¹⁴⁷ <https://unfccc.int/process-and-meetings/the-kyoto-protocol/mechanisms-under-the-kyoto-protocol/the-clean-development-mechanism>

¹⁴⁸ Ibid

¹⁴⁹ Ibid

¹⁵⁰ <https://www.energy.gov.au/related-sites/clean-energy-regulator-cer>

Green Climate Fund

In 2010, the Green Climate Fund (GCF) was established by the UNFCCC as a financial organization to “support the efforts of developing countries to respond to the challenge of climate change” (GCF).¹⁵¹ The GCF receives contributions from developed nations and utilizes them to fund the development of clean energy infrastructure in developing nations. This process of collecting contributions began in 2014, and has since gathered 14.1 billion CAD in donations to cover start-up costs. By 2020, the fund has raised a total of 13.71 billion CAD, excluding GCF start-up costs, for its project portfolio, and aims to expand further by 2030. The significance of the GCF in global renewable energy investments has been immense by redistributing international resources. Furthermore, their importance was emphasized in 2016 when the Paris Climate Agreement designated the GCF as its “financial mechanism” and called for an increase in funding to the GCF.

Despite the GCF’s importance in fulfilling the Paris Climate Agreement and expanding renewable investments, it is currently plagued by mismanagement and structural problems. Part of these challenges arise from the regulations governing the distribution of funds. In order for a country to gain direct access to funding from the GCF, it is necessary for that country to designate a National Designated Authority. This National Designated Authority must be reviewed and approved by the GCF, an approval process that is difficult and requires an organization to fulfil many structural and organizational requirements.¹⁵² Although this arduous process was originally designed to combat corruption, it often results in developing nations being unable to gain funding in an independent way. Furthermore, funding projects submitted to the GCF must be approved by its board of directors, making the approval process inefficient and more bureaucratic. Due to these issues, in order for GCF to serve its intended function, steps must be taken to resolve these challenges.

Climate Action Summit 2019

Recently, in the 2019 Climate Action Summit, a series of commitments were made with the joint goal of preventing global temperature from rising more than 1.5 °C relative to preindustrial levels.¹⁵³ A result of a worsening of the climate crisis and the disparity of the lack of focus, global leaders met to discuss the steps necessary to reach the goals set out in the aforementioned Paris Climate Agreement. However, the actions which the summit agreed upon have been deemed insufficient by many critics, commenting that it fell short of

¹⁵¹ <https://un-rok.org/about-un/offices/gcf/>

¹⁵² <https://climatefundupdate.org/the-funds/green-climate-fund/>

¹⁵³ <https://www.un.org/en/climatechange/2019-climate-action-summit>

what was needed to address the issues.¹⁵⁴ Despite this, important commitments were still made in many areas, with one of them being the Net Zero Coalition where 77 nations pledged to cut their greenhouse gas emissions to 0 by 2050.¹⁵⁵ Other actions include numerous countries' striving to close coal-fuelled power plants by 2030 and the European Union's promise to commit a quarter of their 2020 budget to climate action.¹⁵⁶

The commitments made during the summit also include a series of ecological actions, where nations such as El Salvador, Guatemala, Pakistan and Costa Rica have committed to restoring and protecting important forests and other ecological areas.¹⁵⁷ Furthermore, groups such as the Central African Forest Initiative, stood alongside the aforementioned nations in their goals to protect ecological areas.¹⁵⁸

Climate Change Education for Sustainable Development

The Climate Change Education for Sustainable Development program was founded by UNESCO with the purpose of increasing access to climate change education for the global population and to promote sustainable development. The program achieves its goals by providing support to member states in the form of guidance when creating curriculum on the climate.¹⁵⁹ It also provides a network of climate related education resources that are accessible to its members and encourages "innovative approaches and non-formal education programs through media." (UNESCO)¹⁶⁰ Within the past years, we have seen successful educational initiatives result from this program, as seen with youth leading many iterations of the United Nations Conference on Climate Change.¹⁶¹ Education is an often overlooked factor in encouraging clean energy investments; however, through programs such as this, the population's mindset around clean energy can shift to a more sustainable lens.¹⁶²

¹⁵⁴ <https://www.ecowatch.com/un-climate-action-summit-2640575796.html>

¹⁵⁵ <https://www.un.org/en/climatechange/net-zero-coalition>

¹⁵⁶ https://en.wikipedia.org/wiki/2019_UN_Climate_Action_Summit

¹⁵⁷ Ibid

¹⁵⁸ Ibid.

¹⁵⁹ <https://www.unesco.org/en/education-sustainable-development>

¹⁶⁰ Ibid

¹⁶¹ <https://www.un.org/en/climatechange/youth-in-action>

¹⁶² <https://www.sciencedirect.com/science/article/pii/S2666049022000639>

Possible Solutions

With the current state of clean energy investments, it is clear that the international community must take a multifaceted approach in order to attract more investments. With a specific emphasis on developing nations, green energy investments allow the world to actuate a transition to clean energy. Developing nations have an important role to play in ensuring market stability for investors, while at the same time, nations must seek to make renewable energy more competitive against fossil fuels by incentivizing both private and national investors.

Government Policies

In past success stories of renewable energy investment, a set of government policies that facilitates its growth has always been present.¹⁶³ Through government policies such as providing subsidies and carbon taxation, renewable energy can become extremely lucrative to investors. Furthermore, passing regulations that disincentivize the expansion of fossil-fuel-based power plants can be influential in compelling companies to explore renewable alternatives. For example, the New Source Performance Standards and Permitting Requirements, passed by the US Environmental Protection Agency (EPA) in 2016, placed tremendous limits on greenhouse gas emissions, rendering the construction of new coal-fired power plants impractical and facilitating a switch towards renewables.

However, that is not to say that increasing regulations is strictly positive. Consumer costs and political resistance are two important factors to evaluate. By restricting fossil fuels, the government creates an environment that can make certain energy sources unsustainable, forcing a transition of energy systems and infrastructure. This will inevitably induce an increase in operating costs as an increase in costs in sectors such as shipping and manufacturing adds up for both the consumer and the corporation. Ultimately, this cost will be passed down onto the consumers, which has been the main source of backlash against the aforementioned policies. In addition, any action that reduces the demands of fossil fuels will be met with political resistance from the fossil fuel industry.¹⁶⁴ Lobbying and protests by fossil fuel companies will make these regulations difficult to implement.¹⁶⁵

¹⁶³ <https://www.iea.org/energy-system/renewables>

¹⁶⁴ <https://www.un.org/en/chronicle/article/role-fossil-fuels-sustainable-energy-system>

¹⁶⁵ Ibid.

Government subsidies are also a viable tool that can drive investors towards renewables. Unlike regulations which force companies to use renewables in spite of market conditions, subsidies alter market conditions in favour of renewables.¹⁶⁶ This gives companies legitimate economic incentives to generate profit through investing in renewable installations and reduces consumer costs.¹⁶⁷ However, it's pivotal to recognize that these subsidies require a budget to be allocated that could otherwise be used for other needs, such as social economic issues, healthcare, or infrastructure.¹⁶⁸ This becomes particularly taxing for financially constrained economies. In order for developing nations to offer subsidies, the international community has to first establish systems, such as the GCF, that can help provide funding, education, and resources for the aforementioned projects in these nations.

These methods are all tools that governments can utilize in order to encourage spending on renewable energies. However, it must be noted that energy industries are natural monopolies, meaning that they are intrinsically anti-competitive and tend to create monopolies, as entry into the market requires enormous expenses compared to the operation costs required to stay in the market, discouraging competition.¹⁶⁹ These monopolies are detrimental to the consumer as a lack of competition allows for price gouging and the lack of a market standard can lead to companies cutting corners within production. To protect the consumer, a possible solution is for governments to take ownership of utility companies instead of allowing for a privatized and, inevitably, monopolized market.¹⁷⁰ Ultimately, it can be seen that government policies greatly influence the direction and development of these utility companies.

Carbon Taxation and Redistribution of Funding

A carbon tax is another proven method to reduce carbon emissions and to incentivize investments in renewables.¹⁷¹ Carbon taxes are taxes that are levied on fossil fuel producers, which are redirected to fund the development of clean energy technologies.¹⁷² Furthermore, carbon taxes generate more tax revenue for the government. This extra budget can then be invested into renewable energies. At its core, carbon taxes encourage change and the transition into a more sustainable future through financial incentives against environmentally harmful practices. Within the context of the IEA, the committee

¹⁶⁶ <https://www.iea.org/news/renewable-electricity-growth-is-accelerating-faster-than-ever-worldwide-supporting-the-emergence-of-the-new-global-energy-economy>

¹⁶⁷ <https://www.whitehouse.gov/wp-content/uploads/2022/12/Inflation-Reduction-Act-Guidebook.pdf>

¹⁶⁸ Ibid.

¹⁶⁹ https://cs.stanford.edu/people/eroberts/cs181/projects/corporate-monopolies/benefits_natural.html

¹⁷⁰ https://www.investopedia.com/terms/u/utilities_sector.asp

¹⁷¹ <https://www.imf.org/en/Publications/fandd/issues/2019/06/what-is-carbon-taxation-basics>

¹⁷² Ibid.

could consider creating a standardized tax and encourage heavy emitters, such as China, India, and the United States, to abide by this regulation.

However, carbon taxes have been met with heavy backlash.¹⁷³ Many people have expressed their distaste for carbon taxes due to concerns about potential economic burdens such as transportation costs and rising costs of living, especially for lower-income households.¹⁷⁴ Critics have also highlighted the negative impact that it has on certain industries, leading to unemployment and economic instability.¹⁷⁵ However, despite these drawbacks, many argue that it is a necessary step in transitioning to clean energy and encouraging further clean energy investments.¹⁷⁶ Overall, carbon taxations increase the cost of fossil fuels, thereby encouraging consumers and producers to seek out more energy-efficient lifestyles and causing companies to turn to clean energy alternatives.

Nuclear Energy

Despite past concerns and issues associated with nuclear energy, the technology is still very promising. It is one of the most efficient energy sources available to the world while emitting little to no emissions. However, there still exists a multitude of problems to address.

In order for nuclear energy to continue advancing, government support is critical. The substantial financial investment required for new nuclear plants is a deterrent for many investors, limiting their willingness to undertake such ventures.¹⁷⁷ Instead, many companies have redirected their funding to explore alternative renewable sources, like wind and solar power. In addition, although the risk of a serious accident is minimal, the public continues to perceive it as dangerous, which deters most utility companies. Without government backing, it is unlikely that companies will ever be enticed towards nuclear power.¹⁷⁸ In many developing nations, the government simply does not have the resources to provide this support.

However, international cooperation has allowed for nuclear energy to grow throughout the world's energy market. As an example, international support in the form of funding and trade agreements has developed India's nuclear energy capacity with nuclear energy now making up 2.6% of their entire power grid; however, the country has still experienced more success with other renewable energy sources as solar and wind make up 92% of its

¹⁷³ <https://elawtalk.com/pros-and-cons-of-a-carbon-tax/>

¹⁷⁴ Ibid.

¹⁷⁵ Ibid.

¹⁷⁶ Ibid.

¹⁷⁷ <https://www.iea.org/energy-system/electricity/nuclear-power>

¹⁷⁸ Ibid.

energy production. This highlights the aforementioned issues and emphasizes the work needed to develop nuclear energy. Another example is China, which has achieved remarkable progress in its adoption of nuclear energy by quadrupling its nuclear reactors within the past four years through the use of substantial government investments. These examples not only demonstrate the effectiveness of governmental backing but also underline the potential for nuclear energy to play a significant role in the future.

Education Initiatives

Education is an often overlooked factor when considering methods to increase clean energy investment. However, it has been recognized by UNESCO as one of the most effective ways to progress towards a clean energy future.¹⁷⁹ Currently, climate change education has been embraced by much of the world, including the European Union, the United States, and China.¹⁸⁰

The current policy changes towards clean and renewable energy are often met with backlash from both politicians and populations around the world. This can be largely attributed to preconceived misconceptions and misinformation being circulated and has been harmful to the clean energy transition by slowing down progress and legislation.¹⁸¹ It has also been abused to push political agendas, inciting further misinformation and concern within the global population. This mass skepticism and frustration is usually directed at government initiatives such as carbon taxes. However, through further climate education, individuals will be capable of making informed decisions and opinions on environmental sustainability, which often leads to more support for scientific suggestions on clean energy. Due to the inaccessibility of education in developing countries, this is another area that should be prioritized as education can not only raise more informed citizens but also lead to more innovative and unique technologies to aid the clean energy transition.¹⁸² Such educational programs have been seen to be effective within the European Union specifically, where climate sciences are taught at all levels of education, resulting in a population-wide acceptance of cleaner energy innovations.¹⁸³

¹⁷⁹ <https://www.unesco.org/en/climate-change/education>

¹⁸⁰ Ibid

¹⁸¹ <https://blogs.worldbank.org/developmenttalk/untapped-potential-education-battle-against-climate-change>

¹⁸² Ibid

¹⁸³ Ibid

Bloc Positions

European Union

The European Union is the world's largest provider of developmental aid to developing countries.¹⁸⁴ Many EU member states are home to major companies, most notably Contour Global that produce renewable technologies such as wind turbines.¹⁸⁵ In addition to being involved in global efforts to expand renewable energy sources, the EU also has its own "External Investment Plan," which is designed to funnel more investments from businesses and private investors into developing nations surrounding the EU and in Africa.¹⁸⁶ The EU is also the most reliant on nuclear energy, with France having 70% of its energy based on nuclear energy. This reliance on nuclear energy has proven that clean energy can be financially sustainable. Nations within the EU are incentivized to support policies that shift the world's energy into renewables and to make sure EU companies play a leading role in this transition.

Western Liberal Democracies

Members of this bloc include the United States, Canada, Japan, and other nations aligned with the Global North. These nations have generally been strong supporters of clean energy investment and account for nearly half of the GCF's donations. Furthermore, they hold many key technologies in the renewables sector and have traditionally been key investors in renewable energies abroad.^{187 188}

However, despite the United States' history of supporting renewable energy, the nation took a more conservative stance under the recent Trump Administration. In addition to withdrawing from the Paris Climate Agreement, the administration has also openly expressed its distaste for the GCF.¹⁸⁹ Alongside these views, President Trump has personally spoken about his concerns with clean energy, arguing that its cost and drawbacks outweigh its environmental benefits.¹⁹⁰ However, under the Biden Administration, many of the anti-green energy policies were reversed, as the nation once

¹⁸⁴ <https://www.oecd.org/environment/outreach/EU%20External%20Investment%20Plan.pdf>

¹⁸⁵ https://energy.ec.europa.eu/topics/renewable-energy_en

¹⁸⁶ <https://www.oecd.org/environment/outreach/EU%20External%20Investment%20Plan.pdf>

¹⁸⁷ <https://www.ica.org/news/record-clean-energy-spending-is-set-to-help-global-energy-investment-grow-by-8-in-2022>

¹⁸⁸ Ibid.

¹⁸⁹ <https://www.npr.org/sections/goatsandsoda/2017/06/09/532106567/a-little-known-climate-fund-is-suddenly-in-the-spotlight>

¹⁹⁰ <https://www.forbes.com/sites/brianmurray1/2020/10/25/as-trump-dismisses-renewables-energy-sector-doubles-down/?sh=707066643e13>

again became an advocate for the clean energy transition.¹⁹¹ Given the leading role that the U.S. plays in the bloc, the residues of the Trump Administration's policies could make bloc members unconfident in supporting the U.S. stance. Despite this, the bloc is likely to continue its support for renewable energy alternatives and to promote international cooperation and assistance.

East Asian Clean Energy Investors

Nations in this bloc include China, Korea, and wealthy nations in Southeast Asia that have the necessary resources to invest in renewable energy. In particular, China is the largest investor in renewable energy in the world, far surpassing the rest of the world and involved in half of the world's clean energy investments.¹⁹² In their twelfth Five-Year Plan, China has fully committed itself to the pursuit of clean energy, which involved numerous government subsidies, grants, loans, and other policies to promote the growth of renewables.¹⁹³ ¹⁹⁴ Furthermore, the Chinese government, by enhancing the quality of foreign investments that contribute to the creation of domestic jobs, ensuring equal treatment for domestic and foreign businesses, and providing financial and tax support, actively encourages foreign companies to invest in China.¹⁹⁵ Moreover, China has a significant influence on the renewable energy market. As mentioned before, China produces and develops a large percentage of the world's renewable energy infrastructure. Therefore, there exists both financial and environmental incentives for China to support nations in investing in renewable energy.

Developing Nations

Almost all developing nations in the world, such as Morocco, India, Turkey, etc., support renewable energy and strive to secure the necessary funding to build up their renewable generation capacity.¹⁹⁶ Even though the pursuit of renewable energy helps many developing nations achieve energy security, oftentimes many developed nations place political demands in their funding agreements, which can massively infringe on certain nations' sovereignty.¹⁹⁷ However, due to the volatile economic nature of developing nations, it is not uncommon for these nations to embrace existing fossil fuel resources to

¹⁹¹ <https://www.theguardian.com/us-news/2021/feb/02/biden-trump-environment-climate-crisis>

¹⁹² <https://www.scientificamerican.com/article/china-invests-546-billion-in-clean-energy-far-surpassing-the-u-s/>

¹⁹³ <https://www.c2es.org/document/energy-and-climate-goals-of-chinas-12th-five-year-plan/>

¹⁹⁴ Ibid

¹⁹⁵ <https://www.wilmerhale.com/insights/client-alerts/20230815-china-issues-policy-to-further-boost-foreign-investment>

¹⁹⁶ <https://www.worldbank.org/en/news/press-release/2017/02/15/world-bank-scores-sustainable-energy-policies-in-111-countries>

¹⁹⁷ <https://www.un.org/sustainabledevelopment/energy/>

satisfy their increasing energy demands.¹⁹⁸ Oftentimes, fossil fuels are easy to access for developing nations, along with having pre-existing infrastructure to extract, process and export them.¹⁹⁹ The economic benefits of fossil fuels also incentivize a reliance on them, as, within the foreseeable future, resources such as oil will be valued by much of the world.²⁰⁰ Combined with the expensive initial costs of developing clean energy infrastructure and the relative instability of developing nations, many nations have expressed concerns over embracing clean energy fully. However, due to factors such as abundant investments, lower maintenance costs of operation, and environmental benefits, many developing nations have embraced clean energy.

Alongside the aforementioned issues, many developing nations face budget problems and rampant corruption, all of which erode the confidence of foreign investors. Moreover, developing nations often have a more rural population. Furthermore, their electrical grids are often archaic and inefficient. All of these factors can play a part in the volatility of international organizations in helping developing nations, but further emphasizes the need for it. Therefore, developing nations need to be aware of the specific problems in their government and how it will deter investments.

OPEC

OPEC has recognized the importance of transitioning to clean energy and investing in the clean energy market.²⁰¹ However, as all of its nations are economically dependent on oil exports, a more conservative and oil-centric approach is likely to be taken by this bloc.²⁰² As the OPEC Secretary-General stated, “Fossil fuels remain abundant and are necessary for our future, just as they have been an essential part of our past” (Abdalla Salem El-Badri).²⁰³ Thus, OPEC’s stance relies on expanding pre-existing energy infrastructure and ensuring the stability of fossil fuel products.²⁰⁴

However, OPEC does recognize clean energy as an important sector for the future but primarily focuses on reducing the harmful emissions that are produced by fossil fuels.²⁰⁵ Technologies such as carbon capture and sequestration provide a beneficial alternative and solve many of the existing issues with fossil fuels, allowing for the continued use of fossil

¹⁹⁸ Ibid.

¹⁹⁹ <https://www.bloomberg.com/opinion/articles/2021-03-22/oil-gives-to-developing-nations-but-climate-change-takes-away>

²⁰⁰ Ibid

²⁰¹ https://www.opec.org/opec_web/en/press_room/3467.htm

²⁰² <https://www.investopedia.com/terms/o/opec.asp>

²⁰³ https://www.opec.org/opec_web/en/press_room/3467.htm

²⁰⁴ Ibid

²⁰⁵ Ibid

fuels without damaging the environment.²⁰⁶ However, many are critical of such a stance and state that carbon capture technology is ineffective and unsustainable, accusing OPEC of delaying the progress on climate agreements for self-benefit.²⁰⁷ Thus, nations of OPEC are largely incentivized to prioritize their nation's own interests and economies while balancing progress towards clean energy.

Discussion Questions

1. Does your country have a goal to reduce carbon emissions? If yes, how does it plan on achieving it?
2. What are the pros and cons of having an import based energy economy?
3. What are the pros and cons of government incentives towards renewable energy sources?
4. How much of the world's power generation has shifted to renewables and what are some factors that caused these?
5. How has foreign aid affected the transition into renewable energies?
6. What steps can be taken to enhance investor confidence in the clean energy sector?
7. How does education play a role in the transition to clean energy?
8. How can a government work to support new energy startups?

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²⁰⁶<https://www.reuters.com/business/cop/saudi-minister-says-climate-fight-shouldnt-shun-any-particular-energy-source-2021-11-10>

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DEBATE, DISCUSS, DISCOVER

HORIZONS V