Forum	General Assembly I
Issue	Ensuring Affordable and Clean Energy Access in Developing Regions
Student Officer	Dehao Zhao
Position	Deputy President

Introduction

Energy is one of the most vital components of human civilization, with far reaching impacts across all of society, such as health, education, and the development of infrastructure. Access to energy is therefore crucial to ensure continuous development, particularly for countries in less developed regions. Despite over 91% of the population having access to energy, such energy is often too costly or unreliable to make meaningful impact. Around 1.18 billion of the population are unable to use provided energy, a figure 60% higher than the reported number of those with no electricity access in 2020. A further 447 million do not use energy, despite having adequate access according to official records. This alludes to inequality within the system, possibly due to power outages, equipment malfunctioning, or gaps in the distribution network.

Another issue raised is the sustainability of energy. Many developing areas rely upon polluting or unsustainable energy sources, such as coal, natural gas, or oil. In 2023, fossil fuels produced 140,231 terawatt-hours of electricity, or around 76.5% of total energy consumption around the globe in that year. Such energy sources contribute to global warming, hindering the progress of SDG 13, and Climate action. These SDGs are tightly interlinked, as energy production is one of the major producers of greenhouse gases worldwide.

The importance of this issue was so great that it was implemented by the UN as SDG 7 during the August 2015 meeting of the Open Working Group, attended by around 70 representatives from various countries. SDG7 is further divided into 5 sub-goals, each focusing upon a specific section of SDG7., such as increasing renewable energy consumption (SDG 7.2), improving energy efficiency (SDG 7.3), and ensuring universal energy access (SDG 7.1)

Definition of Key Terms

Clean Energy

Energy sources that do not directly produce climate-warming greenhouse gases, such as Carbon Dioxide or Methane. It is important to note that this does not mean such energy sources have zero environmental impact, but rather that they are low-carbon or carbon-free/neutral. Examples include Solar power, Nuclear Energy, and Hydroelectricity

Energy Inequality

A similar term to energy poverty, which refers to the difference in energy consumption within a country/region or between countries/regions. Areas with greater amounts of poverty often also experience higher rates of energy inequality.

Energy Poverty

The lack of access to sustainable, reliable, and modern energy services or products. This encompasses not only sustainability but also scenarios where there is a lack of access to adequate, affordable, reliable, quality, or safe energy access. It should be noted that a clear line that differentiates poverty from non-poverty cannot be drawn as energy needs vary according to country's development and structure.

Energy Security

The goal of a country, or international community, to support an adequate energy supply, through taking various measures such as safeguarding access to energy resources, furthering the development of associated technologies, creating infrastructure to generate or store energy, and setting affordable prices. It is generally used to refer to countries or regions but can also be used to describe an individual's access to such energy.

Fossil Fuels

Fuels that are composed of organic matter over millions of years. They cannot be replenished on a human scale and release copious amounts of CO2 and pollutants, which negatively affects health and the environment, whilst contributing to global warming. They currently represent the majority of the world's energy generation fuel, with many international organizations urging for a movement towards renewable sources.

Less Economically Developed Countries (LEDCs)

Countries that have lower levels of industrialization, income per capita, and standards of living. These countries face various socio-economic challenges compared to More Economically Developed Countries (MEDCs). They often experience greater energy poverty due to lack of facilities and are oftentimes unable to adopt renewable or more modern sources of energy due to a lack of funds.

Renewable Energy

Renewable energy is defined as energy that is replenished after its use and considered inexhaustible on a human scale. Examples include Wind, Solar, Tidal, Geothermal, Hydroelectric, and Wave power. Such energy is often carbon-free or neutral and releases less pollutants than fossil fuels, making it a better alternative to traditional power sources. However, they are generally more location-dependent or have some form of drawback.

Sustainable Development Goals (SDGs)

The SDGs are a set of 17 goals adopted by all member nations during 2015, which aim to ensure lasting peace and prosperity for both people and the planet. All goals are to be carried out by 2030; each interconnected to another. These goals are widespread, ranging from eradicating poverty to protecting life underwater. Each SDG is further split into more specific goals, but all aim to bolster economic growth, prosperity, and secure humanity's future.

Background

Historical Roots

The concept of Energy Security, and its implications upon society, was born out of the 1970's oil crisis, causing oil-dependent nations to experience energy shortages. This ignited global awareness upon this issue, leading to the creation of various international organizations, such as the IEA (International Energy Agency), and UNEP (United Nations Environmental Program). Whilst these organizations first aimed to secure energy supply, particularly of oil and other fossil fuels, after the revelation of human-induced global warming in 1988, these organizations have shifted towards pushing for renewable energy and carbon-free/neutral energy sources.

This issue was thrust into the limelight even further through its inclusion as SDG 7, Affordable and Clean Energy. In particular, it was mentioned as SDG 7.1, which aims to ensure universal access to modern, reliable, and affordable energy by 2030. Currently, SDG 7 is not on track to being solved, with 675 million people lacking basic energy access. If this issue is to be solved, the growth rate of energy access must double over the next years.

Current Efforts

International organizations and NGOs have made significant contributions towards the realization of this goal. An example of this is the IEA's Electrification in Africa project, a joint effort with Power Africa, an NGO. The project aims to support African governments to ensure the completion of SDG 7.1. Since 2000, The project has gathered immense amounts of data to improve policies and programs of African Governments to accelerate electricity access within the region.

More recently, the 2025 rendition of the Sustainable Energy for All (SEforALL) Global Forum has mobilized USD 900 million towards clean energy access and transitioning from fossil fuels to renewable sources. Many NGOs, such as the ISA (International Solar Alliance), UNOPS (UN Office for Project Services), and SEforAll itself have contributed towards the electrification of LEDCs, mainly towards Nigeria and Sierra Leone. Some other nations, such as Barbados, unveiled plans to reach net zero emissions, keeping on track with the SDGs.

Key Issues

Fossil Fuels Limitations

Fossil Fuels release vast amounts of carbon dioxide into the atmosphere when burned, leading to climate change, and worsening the greenhouse effect. In turn, this causes temperatures to rise over time, leading to more erratic weather, increased wildfires, prolonged droughts, extreme rainfall, ocean acidification, etc. This poses an issue as most energy production relies upon such fossil fuels, meaning the continued rise in temperature. To combat this, international organizations are shifting away from such fuels and promoting investment into renewable and/or carbon free sources, which would reduce emissions of CO_2.

Fossil fuels also directly harm human lives. People often die during the drilling and mining of fossil fuels, mainly oil and coal. The pollution emitted from the burning of fuels also

negatively impacts lives, with 8 million people dying from fossil fuel pollution in 2018 alone. This was caused by particulates in emitted gas, such as traces of heavy metals, mercury emissions, sulphates, and nitrates in the emitted gases. Water contamination from oil spills and leaks also destroys marine life, and harm humans through the removal of safe sources of drinking water.

Economic Cost of Renewable Energy

As it stands, LEDCs are often heavily reliant upon fossil fuels for energy generation and power services. These countries often experience energy poverty and energy insecurity, as they often have poor generation facilities and limited grid service. There is much international pressure for LEDCs to shift towards renewable energy generation, meaning that they may be unable to use up to 95% of their fossil fuel reserves, which is to remain untouched. This foreshadows huge economic losses for these nations, which are unable to effectively diversify their economies. Renewable energy also has high upfront costs. A single industrial wind turbine can cost up to 4 million dollars to install, with a single turbine generating 2 megawatts of energy. Large scale wind farms, with hundreds of wind turbines, can easily cost up to 1 billion. This amount is difficult for LEDCs to finance, meaning aid from other nations or NGOs will be necessary.

Requirements for Renewable Sources

Renewable energy sources often have many requirements for their placement and to ensure efficiency. One such example of this would be hydroelectric dams, which often disrupt many local communities and have detrimental effects on the environment. One such example is China's Three Gorges Dam, which needed the relocation of 1.3 million residents, a technically challenging feat. Dams also disrupt natural ecosystems, destroying natural habitats of fish and other aquatic creatures, whilst animals trapped behind the dam may cause damage to the power plant. Broadly speaking, renewable energy also requires copious amounts of land to be effective, with a 10MW solar farm requiring around 60 acres (242811 square meters) of land. This land cost is unattainable for small island nations, or countries that need land for other purposes, such as agriculture.

Other, less land-using options require many other requirements, or have other drawbacks. For example, geothermal energy requires volcanic land conditions that are uncommon throughout the world, making it difficult to implement on an international scale. Tidal and wave power are inaccessible for landlocked countries, hindering energy access, as most regions experiencing energy poverty are in the sub-Saharan region, where many countries have no access to the sea.

Major Parties Involved

International Energy Agency (IEA)

The IEA was established as a response to the 1970s oil crisis, which caused oil-reliant countries to experience energy insecurity. Whilst it was created to ensure adequate oil supplies, it now addresses a wider range of energy issues, such as energy security, fossil fuel induced climate change, investment into renewable energy, and ensuring energy efficiency. Being the world's leading energy authority, it provides reliable and accurate statistics, data, and research on a varied and wide range of energy topics. It monitors the progress of SDG 7.2 and 7.3.

Whilst the IEA has made multiple contributions towards the realization of SDG7, one of its major methods of contribution is through its Clean Energy Transitions Program (CETP), which has been running since 2017. CETP functions through 3 key methods, strengthening multi-lateral coordination, directly supporting national transitions, and delivering global analysis to aid policy dialogue. As of 2024, it has supported 320 high level meetings with policymakers, conducted 735 workshops and technical exchanges with over 12000 participants, produced or enhanced around 200 reports, delivered 42 training events to over 1200 policy professionals, and secure USD 2.2 billion in funding to help communities access clean cooking methods.

United Nations Development Programme (UNDP)

Born out of the merging between the United Nations Special Fund, and the United Nations Expanded Programme of Technical Existence, it aims to support countries in sustainable development through bolstering their policies, leadership skills, partnerships, and institutional capabilities. It has multiple initiatives and programs to improve energy access in off-grid areas, particularly those in developing areas. Currently, it has 5 main goals for SDG 7, it aims to substantially increase the amount of renewable energy used to generate power, double the annual rate of improvement in primary energy intensity, ensure universal energy access, enhance global cooperation in clean energy research and technology, and expand infrastructure/technology in developing countries, small island nations, and landlocked nations.

World Resources Institute (WRI)

The World Resources Institute, established in 1982, is a global research organization that focuses on tackling issues of environmental and sustainable development. Working across more than 60 countries, it focuses on 7 key areas: energy, climate, food, forests, water, cities, and the ocean. To expedite advancements, the WRI's energy program collaborates with governments, financial institutions, and civil society to further a transition towards clean and accessible energy for all individuals. The WRI provides aid through in-depth insight and analysis aimed at accelerating initiatives that further energy efficiency and develop energy access, with emphasis on India and Eastern Africa. Their renewable energy efforts mainly focus upon aligning and driving investment in electricity markets to meet the growing consumer demand for affordable clean energy.

Sub-Saharan Region

The Sub-Saharan region, particularly the eastern and central areas, has an extremely low electricity generation capacity, while residents experience some of the most extreme cases of energy poverty. Spanning 24 million square kilometers, approximately 600 million people live without reliable electricity whilst 790 million people rely upon solid biomass (animal dung, firewood, charcoal, etc.) to cook and heat their homes. This region represents over 88% of people without energy access, with electrification rates as low as 7% in some areas. Due to this reason, sub-Saharan Africa is one of the most important regions of focus for electrification efforts.

Whilst sub-Saharan Africa currently has poor electrification, the region holds potential for the employment of renewable energy sources. For example, the East African Rift Valley fault makes it possible for Geothermal energy to be implemented in certain sub-Saharan nations, such as Kenya, Ethiopia, and the Democratic Republic of Congo. Furthermore, significant solar energy potential exists within the region, although solutions for energy

storage would need to be developed. Northern sub-Saharan nations with large desert areas are a good example, as they lie within the Sahel region, with much exposure to sunlight. Geographically, such solutions are the most practical, as other energy generation methods, such as tidal, wave and hydroelectric resources are scarce, considering most Sub-Saharan countries are landlocked and hydroelectric dams are quite location specific.

Previous Attempts to Solve the Issue

Mission 300 (Sub-Saharan Africa)

Mission 300 is an initiative led by the World Bank Group (WBG), which aims to connect 300 million people to clean, affordable, and secure electricity by 2030, in line with the SDGs. The combined project is a collaboration between multiple organizations, such as the Ethiopia Electrification Program (ELEAP), the Rockefeller Foundation, and the Accelerating Sustainable and Clean Energy Transformation (ASCENT) Program. As of February 28th, 2025, the combined effort has connected over 21 million people and has pledged a total of USD 50 billion towards this goal.

Mission 300 currently works within multiple Sub-Saharan countries, such as Chad, Côte d'Ivoire, Democratic Republic of Congo, Liberia, Madagascar, Malawi, Mauritania, Niger, Nigeria, Senegal, Tanzania, and Zambia. Currently, it aims to improve power generation to ensure quality, reliable and affordable energy, accelerate the development of Africa's energy sector through the development of renewable energy, and support various governments in enacting policies and reforms to reduce energy poverty and inequality.

Accelerating Clean Energy Access to Reduce Inequality (ACCESS)

A project carried out by the UNDP and the Korean International Cooperation Agency (KOICA), it aimed to provide clean and renewable energy towards areas of high energy poverty and remote areas. Since its start in 2020, it has been implemented in 22 remote Indonesian villages, and 3 municipalities in Timor-Leste. Funding for the project was provided by KOICA, which provided 18,082,509 USD towards the goal. In Indonesia, ACCESS installed solar panels in remote, off-grid areas, helping 3,449 households, and over 14,000 people. With around 3000 solar panels provided, the UNDP has provided 1.1 MW of power towards these isolated communities, leading to the 100% electrification of Indonesia. This marked the conclusion of the project on December 4th, 2024.

ACCESS has also had positive impacts upon the electrified area's economic development and social advancement. The monitoring and development of these electrical systems have created job opportunities, whilst the newfound electrical systems provide ample opportunities for others. Many community members now have newfound jobs as photocopy service providers, cargo transporters, and excavator service providers. These jobs take advantage of the newfound energy access and earn an average of between IDR 1.5-11.6 million a month. Gender equality is also a priority, with 46% of the local technical operators being women.

Possible Solutions

Off-Grid Renewable Energy

Small-scale renewable energy, such as solar panels on roofs, small onshore wind turbines, or generators powered by river currents, can be implemented within rural areas that would otherwise be unserviceable by grid power. These solutions avoid the large land use generally associated with renewable energy and can be implemented in most areas without electricity access. However, this can only work upon the scale of an individual or household, as these methods cannot generate enough power to sustain communities without significant environmental impact, which may in turn destabilize the generation of electricity. Furthermore, effective energy storage systems must be synonymously implemented to ensure a steady supply of electricity even during times when energy cannot be generated (e.g. Solar panels at night). This proves difficult in certain climates, such as cold regions, when energy storage systems become less efficient.

Exporting power towards developing regions

Long-distance power cables can connect LEDCs that are unable to adopt renewable solutions to large scale farms in areas that can effectively harness renewable energy (e.g. solar farms in deserts, wind farms in high-wind areas, geothermal energy in volcanic regions, etc.). This would provide a steady supply of clean energy, whilst reducing dependence on fossil fuels in such LEDCs. Such a project also creates jobs and economic growth, both of which are important for LEDCs to further their development.

This plan, however, is not without its demerits. International trade, like this, can only function effectively in countries that are politically stable and open towards international trade. Many LEDCs, particularly those within the Sub-Saharan region, lack the political stability to facilitate such projects, with corruption and civil wars hindering the viability of such projects. LEDCs may also not have the technological development necessary to build or maintain the power lines, requiring external aid through other governments or NGOs.

International Funding

Donations or loans can help LEDCs overcome the high initial cost of building renewable energy infrastructure, leading to more job opportunities in construction, engineering, and maintenance. Low interest loans and monetary grants have already been used by many international organizations, such as the World Bank, International Finance Cooperation, and various governments. Public-Private partnerships are also crucial in developing the renewable energy sector in LEDCs.

Corruption can pose a major threat towards this operation, and funds would need to be carefully tracked to ensure their correct use and to disincentivize fraud and embezzlement. As many LEDCs are high in corruption, this poses a significant challenge. An over-dependence on donors may also be dangerous, and countries would need to ensure that they are able to support the project even after the funding ends.

Bibliography

14 Disadvantages of Using Fossil Fuels. 29 Mar. 2022,
https://www.1energysystems.com/disadvantages-of-using-fossil-fuels/.

Beyond Access: 1.18 Billion in Energy Poverty despite Rising Electricity Access.
https://data.undp.org/blog/1-18-billion-around-the-world-in-energy-poverty.

Deaths from Fossil Fuel Emissions Higher than Previously Thought.
https://seas.harvard.edu/news/2021/02/deaths-fossil-fuel-emissions-higher-previously-thought. Accessed 6 Apr. 2025.

Empowered Community through Sustainable Energy: ACCESS Project Closing Event.
6 Apr. 2025, https://www.undp.org/indonesia/press-releases/empowered-community-through-sustainable-energy-access-project-closing-event .

Global Forum Mobilizes USD 900 Million for Energy Access, Energy Transition.
https://sdg.iisd.org/news/global-forum-mobilizes-usd-900-million-for-energy-access-energy-transition/ .

'Goal 13: Climate Action'. *The Global Goals*, https://globalgoals.org/goals/13-climate-action/. Accessed 6 Apr. 2025.

Iceland - Countries & Regions - IEA. "Iceland - Countries & Regions - IEA." IEA, 2023,

www.iea.org/countries/iceland. Accessed 23 May 2025.

Johnston, Marco. 'How Much Does It Cost to Heat a House in Iceland?' *Geographic FAQ Hub: Answers to Your Global Questions*, 24 June 2024,
https://www.ncesc.com/geographic-faq/how-much-does-it-cost-to-heat-a-house-in-iceland/.

Kuhn, Anthony. 'Relocated Three Gorges Residents Face Challenges'. *NPR*, 3 Jan. 2008. *NPR*, https://www.npr.org/2008/01/03/17784497/relocated-three-gorges-residents-face-challenges.

***Least Developed Countries Cannot Afford to Strand Their Assets, given Their Development Challenges | UN Trade and Development (UNCTAD)*. 26 Nov. 2021, https://unctad.org/news/least-developed-countries-cannot-afford-strand-their-assets-given-their-development-challenges*.**

'Mission 300 Is Powering Africa'. *World Bank*,
https://www.worldbank.org/en/programs/energizing-africa/faq2. Accessed 6 Apr. 2025.

**Nations, United. 'Goal 7—Ensure Access to Affordable, Reliable, Sustainable and Modern Energy for All'. *United Nations*,
https://www.un.org/en/chronicle/article/goal-7-ensure-access-affordable-reliable-sustainable-and-modern-energy-all. Accessed 6 Apr. 2025.**

Nations, United. 'Iceland's Sustainable Energy Story: A Model for the World?' *United Nations*, https://www.un.org/en/chronicle/article/icelands-sustainable-energy-story-model-world. Accessed 23 May 2025.

**'SDG7 Progress and Info'. *United Nations*,
https://www.un.org/en/energy/page/sdg7-progress-and-info. Accessed 6 Apr. 2025.**

Sub-Saharan Africa | Countries, Number, Map, Population, & List | Britannica. 22 May 2025, https://www.britannica.com/place/sub-Saharan-Africa.

Ritchie, Hannah, et al. 'Energy Production and Consumption'. *Our World in Data*, July 2020. *ourworldindata.org*, https://ourworldindata.org/energy-production-consumption.

Ritchie, Hannah, and Pablo Rosado. 'Fossil Fuels'. *Our World in Data*, Oct. 2017. *ourworldindata.org*, https://ourworldindata.org/fossil-fuels.

The East African Rift Realising the Regions Geothermal Potential. 17 Nov. 2020,

https://www.irena.org/news/articles/2020/Nov/The-East-African-Rift-Realising-

the-Regions-Geothermal-Potential.

The Energy Challenge in Sub-Saharan Africa. 25 Jan. 2017,

https://www.oxfamamerica.org/explore/research-publications/the-energy-

challenge-in-sub-saharan-africa/.

Thompson, Michael. 'Cost Analysis: How Much Do Commercial Wind Turbines Really Cost?' *Sigma Earth*, 19 May 2024, https://sigmaearth.com/cost-analysis-how-much-do-commercial-wind-turbines-really-cost/.

What Is Energy Poverty: Definition, Statistics & Effects on Society. https://www.habitat.org/emea/about/what-we-do/residential-energy-efficiency-households/energy-poverty. Accessed 6 Apr. 2025.

About Us, https://www.undp.org/about-us.

https://www.undp.org/sdg-accelerator/background-goals

https://www.iea.org/reports/clean-energy-transitions-programme-2024