



Finding measures to provide energy access for the global population

Committee: ECOSOC

Student Officer: Yuhan (Charles) Lin



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Name: Yuhan (Charles) Lin

Position: Deputy President

Introduction

Access to reliable and clean energy is a critical issue the global population is facing today. One of the major uses of energy is for electricity, and according to the International Energy Agency (IEA), an estimated number of 775 million people do not have access to electricity which has risen by 20 million compared to 2021. Much of this number originates from the 47 Least Developed Countries (LDCs), especially from the Sub-Saharan Africa region, with examples such as South Sudan, where the electricity access rate reaches as low as 7.2%. Countries in the Sub-Saharan region are not the only countries greatly affected, but regions such as Africa, Asia, the Pacific and Latin America also become members in question when discussing the issue of the deprivation of energy.

The agenda created in 2015 by the United Nations (UN) known as the 2030 Agenda for Sustainable Development, better known as the Sustainable Development Goals (SDGs), strive to 'provide a blueprint for peace and prosperity for people and the planet, now and into the future.' With increasing global energy access being in this agenda, as the 7th goal states to 'ensure access to affordable, reliable, sustainable and modern energy for all', global efforts should be utilised to tackle this issue to reach this target by 2030, especially stimulated by the significant role that energy consumption plays in individuals' daily life. Having a lack of access to reliable energy could potentially lead to major devastating effects and impacts on local communities and on the lives of individuals; and this could include the reduction of the possibility of education, reduction of quality of healthcare, limitation to economic opportunities and reduction to the overall quality of life. With climate change also becoming a serious issue, these negative impacts towards individuals' well-being may even be exacerbated, further reducing the equality of opportunity for citizens.

To prevent these negative impacts on the personal scale, national scale and global scale, renewable solutions for this issue of energy production and distribution towards all countries, especially for the LDCs, must be explored and analysed, while also striving towards a sustainable future, counteracting against the significant effects of climate change.

Definition of Key Terms

Energy access

Energy access is when households have an available, reliable and safe energy source; this includes electricity access or better known as electrification, heating and cooking. The possession or deprivation of energy access could affect many broader factors such as public services, economic opportunities and local industries.

Solid fuel

Solid fuels are a type of energy source that is burned to produce heat. They are often used for cooking or heating and four very common types of solid fuel include wood, charcoal, coal and dung. When used in cooking, it can cause health and environmental issues and is not a clean cooking fuel.

Clean cooking

Clean cooking is the utilisation of cleaner fuels and more energy-efficient stoves for cooking and can be seen as an important energy use. This contrasts with the traditional manner of cooking, i.e., using traditional solid fuels, kerosene and biomass, which emits more household pollution and causes more health risks for citizens.

Sustainability

As defined by the UN, sustainability is 'meeting the needs of the present generation without compromising the ability of future generations to meet their own needs.' Being one of the main goals of the Model United Nations (MUN) and the 17 SDGs, this factor must be considered when analysing the issue of energy access for long-term solutions.

Renewable energy

Renewable energy is energy generated from natural sources and energy that can be 'replenished at a higher rate than they are consumed', according to the UN, and includes solar, wind, geothermal, hydropower and bioenergy. This category of energy is vital in creating a sustainable future as it produces fewer carbon emissions than that of non-renewable energy.

Total Final Energy Consumption (TFEC)

Total Final Energy Consumption is the measure of the total amount of energy used by the end users through purposes such as heating, cooking, lighting etc. TFEC is an important indicator to

track and recognise trends in global energy consumption, as it could be used to gain insights and assess the effects of different policies, allowing people to take steps in the right direction of becoming more sustainable.

Less Economically Developed Countries (LEDCs)/Least Developed Countries (LDCs)

Less Economically Developed Countries or Least Developed Countries include a group of 47 countries: 33 countries in Africa, 14 in Asia and the Pacific and 1 in Latin America as stated by the United Nations. These countries can be characterised 'by their low socio-economic development and vulnerability to external shocks [having] largely agrarian economies, suffering from low investment levels and low productivity.' These countries have the highest population with the least access to energy.

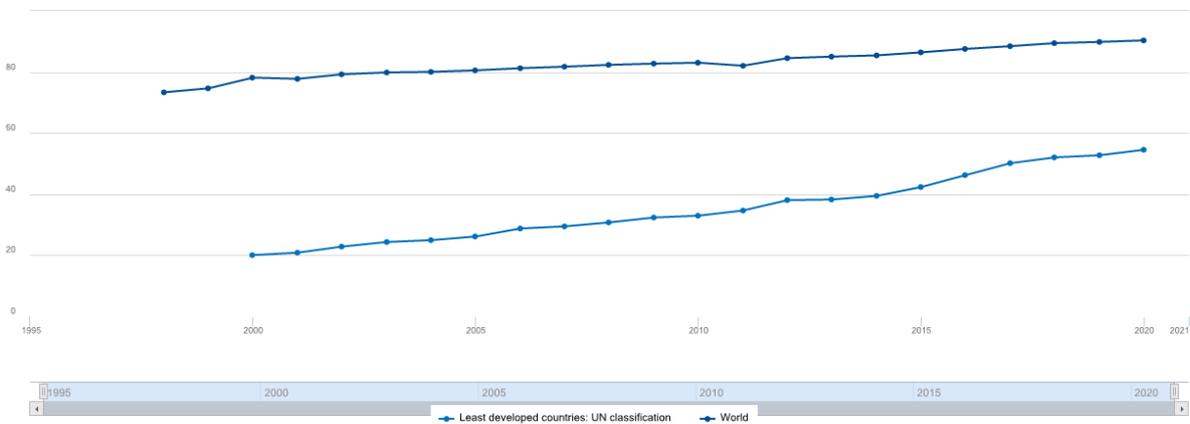
General Overview

Energy is crucial in everyone's daily life. However, at the core of energy generation and distribution, the different types of non-renewable and renewable energy sources play the most important role in their production. Only with access to these sources could there be further access to the necessities that individuals and local communities require to live healthily; and this includes access to electricity, heating and clean cooking etc. Even for governments and larger industries, these energy sources are required to power different types of machinery, infrastructures and transportation etc. As mentioned previously, electricity may be recognised as one of the most important uses of energy, if not the most important because of the plethora of further usages such as for communication, lighting, healthcare, industrial processes etc. Without access to any of the types of energy sources or subsequent usages, citizens' or communities' well-being may become heavily damaged, and this effect is demonstrated by the experience of the majority of the LDCs, especially in the region of Sub-Saharan Africa. Despite the necessary improvements which are required to be made in reaching equal energy generation and distribution across the world, significant progress has already been made in the past decade, which will be outlined below, however, delegates should consider how this process of distribution could be optimised and thus sped up.

Due to the diversity in each energy source and their usage, it is also vital to differentiate these various categories, as some energy sources may not apply to certain situations. Furthermore, which energy sources and their uses such as the different types of accesses are to be emphasised and prioritised, should be a decision later considered by the delegates.

Access to electricity

Electricity is one of the most important uses of energy in the world today. However, the lack of electrification in LDCs is still a major issue today, an issue which requires the utmost attention.



Series : Access to electricity (% of population)

Figure 1: World Development Indicator, "Access to electricity (% of population)", World Bank, DataBank,

The above chart shows the percentage of population which have access to electricity, globally (top line) and in specifically LDCs (bottom line). From the chart above, we can see that improvements to the global electrification rate have overall increased from 1996, when the data was first recorded. It has increased from 73.4% in 1996 to 90.4% in 2020. However, comparing the global electrification rate to the electrification rate of LDCs, there is a drastic difference. LDCs have approximately 60% of the electrification rate of that of all the countries around the world in 2020, with LDCs' rate standing at around 55%. Despite the progress achieved with the increase in LDCs' electrification rate from 20.1% in 2000, there are still more than 500 million people living without electricity, in LDCs only. As of 2020 according to the World Bank, the countries with the least electricity access, in order, includes South Sudan (7.2%), Chad (11.1%), Burundi (11.7%), Malawi (14.9%) and Central African Republic (15.5%). Data on electricity access for all countries can be found in the appendix. Fortunately, concerning the Istanbul Programme of Action (IPoA), a programme created on 'reducing LDC's vulnerabilities and addresses new challenges to development', focusing on the decade of 2011-2020, these mentioned countries and especially LDCs with a lower electrification rate contributed hugely towards an overall growth rate of 66% between the targeted period.

However, to make matters worse, this graph merely shows the overall change in global and LDCs electricity access from 2000 to 2020, but inside each country itself, the disparity between urban and rural areas is even more extreme. According to the UN, 'In 2018, on average, 78% of the urban population in LDCs had electricity access, compared with only 39% of rural populations.'

As mentioned previously, the deprivation of electricity can negatively affect both the personal and societal scale. While individuals' well-being and overall quality of life may be greatly reduced, public services such as schools, hospitals and any communal facilities may also become incompetent, and its effect diminished. On a broader scale, in local and global industries, the lack of electrification could cause huge shortages in supply lines, such as hindering the ability to process machineries, lighting, transportation and communication. Damaging the ability of especially larger companies to continuously supply the global market could further lead to market failures in the global economy, possibly encouraging the development of a commencing recession. Likewise, for local industries, the shortage of electricity could mean the little number of local industries available for citizens to be employed in, therefore increasing the unemployment rate, increasing the inequality in economic opportunity and thus decreasing the country's overall gross domestic product (GDP).

In LDCs, it may be especially difficult to rapidly invest money into electrification due to their social circumstances such as extreme poverty or governmental corruption. Therefore, without foreign aid in electricity distribution, or sufficient funding, LDCs would only progress tremendously slowly, being forced to allow its immense population to suffer from the deprivation of electricity. Similarly, with its industries, only when funding is directly provided by private companies from elsewhere around the globe, could there be a rapid increase in GDP for the country itself.

Access to clean cooking

The possibility of the possession of clean cooking facilities is another major usage of energy sources. The specific emphasis on the word 'clean' portions out a major part of the population with their cooking facilities, as clean facilities require pricier types of energy sources and in turn, provides numerous advantages compared to that of the ordinary utilisation of normal cooking.

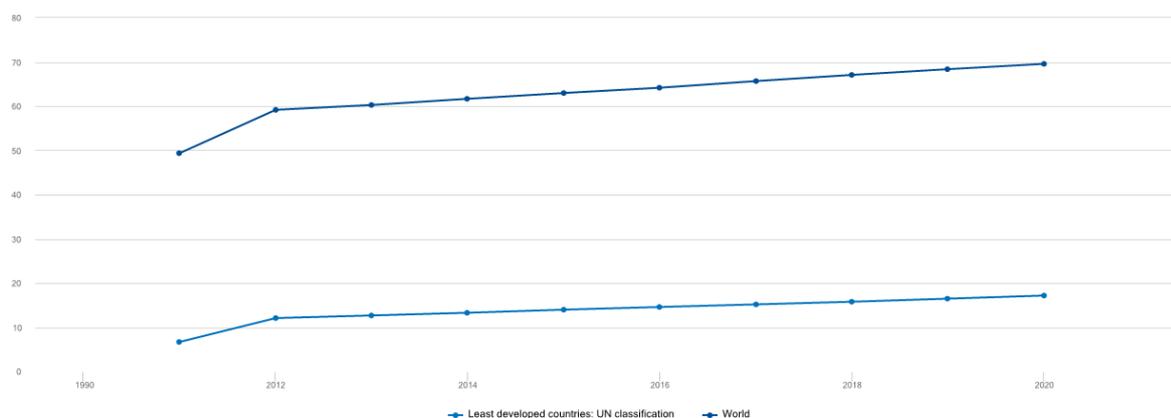


Figure 2: World Development Indicator, "Access to clean fuels and technologies for cooking (% of population)", World

The above chart shows the percentage of population which have access to clean fuels and technologies for cooking, globally (top line) and in LDCs (bottom line). From the chart, we can recognise that the percentage of the population with access to clean cooking has a positive trend with time. It increased from 49.4% in 2000 to 69.6% in 2020 and similarly with LDCs, a similar trend can be seen as it increased from 6.7% in 2000 to 17.2% in 2020. However, despite the percentage of the population with access to clean cooking in LDCs being on the rise, the absolute number of populations without clean cooking in LDCs is also increasing due to population increase. According to the International Energy Organisation (IEA), globally a third of the world population, 2.4 billion people do not have access to clean cooking, and in Sub-Saharan Africa only, around 940 million people do not have access, 'making sub-Saharan Africa the only region where the number of those without access continues to rise significantly.' In Asia, a brighter development can be seen during the IPoA targeted years, as around 776 million people have gained access to clean cooking facilities, 'with China and India accounting for 570 million of the totals, thanks to the liquified petroleum gas (LPG) programme and clean air policies.' However, to worsen this situation, approximately 50 million people have reverted to harmful cooking methods due to the Covid-19 pandemic, threatening to reverse the progress made especially in Asia and Africa.

The practice of unclean cooking methods and facilities poses many harmful effects on the human body and the environment. According to the World Health Organisation (WHO), around 2.4 billion people use solid fuels and kerosene for cooking. The use of solid fuels creates household air pollution, filling the housing environment with damaging pollutants, such as particulate matter (PM_{2.5}), which have the ability to 'penetrate deep into the lungs and enter the bloodstream' and harm the immune and the respiratory system, further increasing the chance of premature death. Illnesses such as lung cancer, chronic obstructive pulmonary disease (COPD), coronary heart disease (CHD) and strokes can be caused by extreme and frequent exposure to household air pollution, with all diseases directly contributing to the estimated 3.2 million premature death annually. In addition, the inhaling of air pollutants could further cause other illnesses such as tuberculosis and other types of cancers. Moreover, especially women and children experience the health risk formed by the traditional way of cooking, as they are the ones who are typically completing household labour such as collecting wood and cooking in many countries and thus would expose themselves to household air pollutants. Not only the air pollutants but other risks and dangers are also prevalent, as WHO further states that the 'ingestion of kerosene by accident is the leading cause of childhood poisoning, and a large fraction of the severe burns and injuries occurring in low- and middle-income countries are linked to household energy use for cooking, heating and lighting.'

The use of solid fuels in traditional cooking methods also contributes to several environmental effects. The continuous incomplete combustion of solid fuels and kerosene causes the release of pollutants such as carbon particulates or better known as soot, which further enhances air pollution and global warming. Also, the use of wood as a solid fuel encourages the process of deforestation, which contributes towards damage and destruction of ecosystems, and also towards climate change. The practice of unclean cooking also is energy inefficient, as the electrical appliances may be poorly designed or old. This increase in energy consumption may become a problem for especially countries with limited access to energy due to the shortage of fuels.

Renewable energy sources

To strive towards reaching the sustainable 7th SDG created in 2015 and 2016, the universal usage of renewable energy sources and improving energy efficiency has become a crucial topic of discussion, as high energy consumption from burning non-renewable energy becomes and maintains to be one of the main contributors towards greenhouse gas emissions and global warming.

During the 1990s and the 2010s, international agreements have been made to aim to mitigate the effects and reduce the damage of the growing concern on global warming. The United Nations Framework Convention on Climate Change (UNFCCC), created and signed by many parties in 1992, has an objective ‘to stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system, in a time frame which will allow ecosystems to adapt naturally and enables sustainable development.’ The UNFCCC thus created a framework to attempt and reduce the development of global warming, which is later in 1997 and 2015 operationalised in the Kyoto Protocol and Paris Agreement (COP21), respectively. Both agreements sought to ensure a sustainable future for the global population, by first, limiting global temperature rise from 2 degrees Celsius to 1.5 degrees Celsius; and, reducing greenhouse gas emissions, particularly from the burning of fossil fuels and non-renewable energy sources, and further promoting the use of renewable energy sources.

Globally, the total final energy consumption (TFEC) of renewable energy is on the rise. According to the IEA, with around a 3% increase in TFEC from renewable energy in 2020 and an 8% increase in 2021, China, the USA, the European Union (EU) and India contributed to most of this increase – approximately 80% of this increase. This percentage increase is estimated to grow exponentially, by 60%, for the next 4 years.

However, for LDCs, this increase in renewable energy usage is much lower. Even though there is an absolute increase in the TFEC in LDCs, there is a percentage decrease in the TFEC from 76.02% in 2010 to 72.95% in 2015 according to the World Bank. This decrease is due to the increase

in the usage of traditional fuels such as biomass, which are much cheaper compared to renewable sources. In 2017, the Least Developed Countries Renewable Energy and Energy Efficiency Initiative for Sustainable Development (LDC REEEI) is created by LDCs to encourage and strive towards reaching the 7th SDG in 2030 for especially LDCs, and reach '100% electricity from renewable energy sources in all LDCs by 2050 that caters to all needs of their citizens, social services and industries.' One of the major problems that LDCs face in energy access from especially renewable sources, is the lack of funding received from foreign nations, normally More Economically Developed Countries (MEDCs). Thanks to the International Renewable Energy Agency (IRENA) and Organisation for Economic Co-Operation and Development (OECD), greater multilateral economic cooperation between countries has already been recognised especially on the topic of energy distribution towards LDCs in the past decade, however, this funding would be continuously required to aid the process of transitioning to renewable energy sources to extend sustainability.

Timeline of Key Events

Date	Event
November 18 th , 1974	The International Energy Agency (IEA) founded by 17 countries
June 4 th -14 th , 1992	The United Nations Framework Convention on Climate Change (UNFCCC) signed by 165 parties, currently with 192 parties
December 11 th , 1997	The signing of the Kyoto Protocol to operationalise the UNFCCC by 84 parties
January 26 th , 2009	The International Renewable Energy Agency (IRENA) founded by 75 countries
December 12 th , 2015	The signing of the Paris Agreement (COP21) to limit global warming signed by 196 parties
January 1 st , 2016	The creation of the 17 Sustainable Development Goals (SDGs), which are aimed to be reached by 2030

2017	The creation of the LDC REEEI to accelerate renewable energy abilities in LDCs by 2030 and 2050
2011-2020	The period of focus for the Istanbul Programme of Action (IPoA) towards LDCs

Major Parties Involved

The United States of America (USA)

With around 21% of its electricity generated from renewable sources in 2020, the United States is one of the countries with the largest amount of energy production (60,300 GWh) from renewable energy sources, standing 2nd globally according to IRENA (All other countries' energy production from renewable energy sources can be found in the appendix). The USA also has an agency, The United States Agency for International Development (USAID), which provides foreign nations with support and assistance, technologically and financially. Through USAID's Scaling Up Renewable Energy (SURE) programme, the US strives towards partnering up with countries and helping them to transition towards 'more widely accessible, affordable, reliable and sustainable energy', aiding especially developing countries towards a more sustainable future through energy access.

The People's Republic of China

Being the highest energy producing country (99,000 GWh) through renewable sources in 2020 according to IRENA, China has made significant progress in increasing the utilisation of these sources. With China's 14th Five-Year Plan (2021-2025), China aims to reach 33% of its energy to be generated by renewables, and is currently on track for this target. China has also aided developing countries with financial aid. Although the aid is unsustainable, China 'has provided more than \$40 billion US dollars in overseas financing for coal-fired power stations since 2000.' However, more recently China has commenced the provision of low-carbon energy generation facilities in specifically South-East Asia, in order to follow the Paris Agreements (COP21), with renewable sources such as wind, solar, geothermal and hydropower.

Less Economically Developed Countries (LEDCs)

As previously stated, LEDCs are countries that can be recognised to have little socioeconomic development, including countries from Asia, Africa and South America. These countries are the most deprived of energy and require the most foreign assistance in order to



develop their energy distribution, access and usage. LEDCs have also created the LDC REEEI in 2017, which is specifically aimed at all LEDCs, using an initiative and framework to improve its renewable energy development and implementation. According to The World Bank, countries with the least amount of energy access include: South Sudan, Chad, Burundi, Malawi, Central Africa Republic (CAR) and Burkina Faso.

International Energy Agency (IEA)

Established as a result of an energy crisis which occurred in 1973, the IEA is an intergovernmental organisation which records and analyses data of the TREC on the global scale and explores global greenhouse gas emission with its effect towards global warming. It then provides policies and recommendations, working towards reaching the 7th SDG by 2030.

International Renewable Energy Agency (IRENA)

The IRENA is an intergovernmental organisation that, similar to the IEA, analyses data and completes research but towards renewable energy sources specifically. IRENA aids countries in the process of transforming to the implementation of renewable energy and through global multilateral cooperation, striving towards a sustainable future.

Possible solutions

To tackle this issue of global energy access, delegates may consider confronting the issue of the causation of lack of energy supply and its effects of it separately, i.e., separating the issue of renewable energy sources, from the issue of electricity and clean cooking. However, it may also be viable to consider short-term and long-term solutions with caution.

With this issue, a majority of the challenge of the deprivation of energy lies on many LDCs, thus the emphasis could be placed on these member-states. As aforementioned, many MEDCs already have complete access to energy, and thus delegates may consider the different manners of distribution of excess generated energy from inside the MEDCs to neighbouring LDCs. Most LDCs' problem correlates with a lack of funding or a corrupt government, and therefore solutions may be the direct economic support towards these LDCs. Even though the fact that MUN has unlimited funding, an important factor to study may be where this funding will be originated from.

Another significant factor to consider while coming up with solutions is the idea of sustainable development. To combat the aforementioned increase in greenhouse gas emissions, renewable long-term solutions should be considered by delegates, and this could include solutions such as the encouragement of the installation of newer sustainable technology etc. Improving

energy efficiency such as through multilateral research may be another solution for this issue, as making the usage of energy more effective would require less TFEF overall. However, generally, delegates should consider which solutions are to be emphasised and which solutions are more realistic than others.

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Appendix

Appendix I

All countries’ access to electricity data: <https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS>

All countries’ access to clean cooking data: <https://data.worldbank.org/indicator/EG.CFT.ACCS.ZS>

Appendix II

The IPoA report:

<https://documents-dds-ny.un.org/doc/UNDOC/GEN/N11/376/42/PDF/N1137642.pdf?OpenElement>

Appendix III

The LDC REEEI Framework:

http://ldcreeei.org/wp-content/uploads/Core_publications/LDC_REEEI_Framework_English.pdf

Appendix IV



All countries' energy production from renewable energy sources:

<https://www.irena.org/Data/View-data-by-topic/Capacity-and-Generation/Country-Rankings>