Sustainable Energy

Energy is central to nearly every major challenge and opportunity the world faces today. Be it for jobs, security, climate change, food production or increasing incomes, access to energy for all is essential.

Sustainable energy is opportunity – it transforms lives, economies and the planet.

UN Secretary-General Ban Ki-moon is leading a Sustainable Energy for All initiative to ensure universal access to modern energy services, improve efficiency and increase use of renewable sources.

Facts and figures

- ¥ One in five people still lacks access to modern electricity.
- ¥ 3 billion people rely on wood, coal, charcoal or animal waster for cooking and heating.
- ¥ Energy is the dominant contributor to climate change, accounting for around 60 percent of total global greenhouse gas emissions.
- ¥ Reducing the carbon intensity of energy is a key objective in long-term climate goals.

Background

Development is the process of expanding human potential. It involves alleviating poverty and preventable disease as well as providing educational and economic opportunities. **Sustainable development means meeting people's current needs without compromising the ability of future generations to meet their own needs**. In other words, sustainable development requires people to **protect the environment so that development can continue in the future.**

Energy is vital to achieving sustainable development. People need energy to satisfy their basic needs for clean water, food, sanitation and housing. But two billion people have no access to energy services, such as electricity in their homes. The challenge is to find a way to provide energy for these people, as well as for businesses, without depleting too many natural resources or adversely affecting the environment.

Energy production, distribution and consumption all have negative effects on environment. Some effects are felt locally, while others affect the whole region, or even the global environment. During energy production, fuels like coal are often burned to produce electricity. This process creates air pollution, which is damaging to people's heath and the environment. Coal and other fuels must be mined, or extracted from the ground. These extractive industries, such as oil and coal mining, can be very damaging to the environment. There is a limited supply of coal and oil on earth, so this fuel cannot be renewed after it is used. In addition, pollution caused by energy production and consumption can reduce soil quality and cause acid build-up in the water supply.

The burning of fossil fuels, such as oil and coal, also causes a phenomenon called global warming, or global climate change. When fossil fuels are burned, they release chemicals called greenhouse gases. These chemicals, including carbon dioxide, hold heat inside the earth's atmosphere. Scientists believe that the greenhouse effect will cause the Earth's temperature to rise significantly. They believe an increase in the amount of greenhouse gases will destabilize weather patterns on Earth. Recently scientists have been pointing out warning signs that suggest such a trend is already occurring.

Even though producing and consuming energy has serious environmental costs, it is vital to sustainable development. Energy, in the form of electricity, is used for lighting, refrigeration, machines, manufacturing and telecommunications. But there are still many regions on earth without adequate access to electricity. In

the last 25 years, more than one billion people gained access to electricity. However, another 1.6 billion people around the world still lack access to electricity.

Electricity is needed in order to encourage investment and economic growth, which are important components of development. Economic growth can help provide higher wages and new employment opportunities, which can help to alleviate poverty. But companies and individuals need energy in order to produce goods and services. Imagine trying to run afactory in a location where electricity was unavailable or unreliable. Most companies probably would not build a factory in such a location. Consequently, there may be too few job opportunities for the people who live there.

When people do not have access to energy in the form of electricity, they must use traditional alternatives like fuel wood or charcoal. These forms of energy are harmful to people and to the environment. People must cut down trees in order to gather fuel wood, which can cause erosion. In addition, the burning of fuel wood creates indoor air pollution that can be very harmful to the health of the inhabitants, especially small children. The use of fuel wood also has far-reaching social effects. Because people must spend many hours out of each day colleting fuel wood, they are not able to use that time to work or go to school. Many girls in particular are not able to go to school because they are traditionally responsible for collecting fuel wood.

Access to energy is a problem that affects primarily the poor, usually in developing regions. But environmental damage also tends to disproportionately affect the poor in society. In industrialized urban areas, the poor tend to live closest to pollution-producing factories and highways. In rural areas, the poor are most likely to be exposed to indoor air pollution from traditional fuels such as fuel wood. They are also more vulnerable to soil and water pollution because they often depend on agriculture.

Some of the most commonly used fuels today are fossil fuels—oil, coal and natural gas. Fossil fuels are popular because they are relatively inexpensive and the technology needed to use them is widely available. Most automobiles run on gasoline, which is made from oil, and fossil fuels are often burned to produce electricity. But these fuels pollute the air and water, contribute to global warming, and they are non-renewable. In contrast, renewable resources are those that do not deplete, or run out, such as sunlight, wind and water. The committee may wish to consider the benefits and drawbacks of a variety of renewable energy resources, including solar power, hydropower, tidal power, wind power and biomass.

Tidal power is a way of generating electricity that uses the power of tides—the cycle of rising and falling water levels caused by the gravitational pull of the sun and the moon. The energy of these water flows can be captured by building a dam, usually close to where a river and the ocean meet. The flowing water goes through a turbine—a spinning machine that consists of a wheel with blades. The water passing through the turbine turns the blades, which powers a generator that creates electricity.
Wind Power has been used as a source of energy for over 4,000 years. Today, wind towers collect energy to be used in homes and businesses. A wind tower is made up of a long pole with a propeller at the top. The propeller is blown by the wind, which then starts a generator that collects the energy. Usually the wind towers are built very closely together creating what is known as a “wind farm.” Wind farms are usually built in areas that have very strong and heavy winds. Wind generators can also be found on boats – they help to regenerate the boat’s batteries.

Solar Energy makes use of the sun’s radiation. Solar cells, also called photovoltaic and photoelectric cells, are one way to harness the power of the sun. Solar cells convert sunlight directly into energy by trapping the light in solar panels. This form of energy is used to power everything from satellites to pocket calculators. Some people use solar
panels on the roofs of their homes or businesses to supply their electricity. There are also power stations that have been built to convert solar energy to usable electricity.

Hydropower, like tidal power, uses the flow of water to create energy. To create hydroelectricity, a dam is built in a lake or large river, with tunnels running through the dam. There are turbines inside of each tunnel. As the water travels through the tunnel, the water forces the blades of the turbine to spin which starts the generator inside of the turbine. The generator collects the energy from the movement of water within the tunnel.

Biomass refers to plants and biodegradable wastes that can be burned for fuel. Plants like switchgrass, corn and sugarcane can all be used for fuel. Although current use of biomass is limited, interest in this form of

energy is growing as countries look for renewable sources of energy.

Nuclear energy is a controversial form of energy generation that uses radioactive uranium as fuel. The uranium is broken down in a process called fission that releases huge amounts of energy in the form of heat. This heat is used to produce steam, which in turn is used to power a turbine, creating electricity. Nuclear energy is not a renewable source of energy, but it does have the benefit of not releasing carbon emissions. The radioactive material that is used to create the chemical reaction that produces nuclear power can be extremely dangerous. Although nuclear power plants insist that nuclear power is safe if properly monitored, there have been accidents that result in a release of radiation, such as in Chernobyl, Ukraine and Three Mile Island in Pennsylvania. In addition, the waste created by nuclear power remains radioactive and must be securely contained.

Past Actions

In November 2009, the United Nations Development Program and the World Health Organization published a joint report titled "The Energy Access Situation in Developing Countries: A Review Focusing on the Least Developed Countries and Sub-Saharan Africa (SSA)". This report contains several shocking facts that demonstrate how far behind we are in providing safe energy access to the world's population such as:

Three billion people – almost half of humanity – still rely on solid fuels, traditional biomass and coal. In LDCs and SSA, more than 80 percent of people primarily rely on solid fuels for cooking, compared to 56 percent of people in developing countries as a whole.
Two million deaths annually are associated with the indoor burning of solid fuels in unventilated kitchens. Some 44 percent of these deaths are in children; and among adult deaths, 60 percent are women. In LDCs and SSA, more than 50 percent of all deaths from pneumonia in children under 5 years and chronic lung disease and lung cancer in adults over 30 years can be attributed to solid fuel use.

Of 140 developing countries, 68 countries have established targets for access to electricity, but only 17 countries have targets for access to modern fuels and 5 countries for access to mechanical power.

There have been several attempts in the past two decades to prevent further damage to the environment caused by energy production and consumption. Most efforts focus on reducing dependence on fossil fuels and increasing the use of alternative sources of energy, particularly those that are renewable.

The United Nations Framework Convention on Climate Change (UNFCCC) recognizes that the climate system is a shared resource among all nations. It was introduced in 1992 and entered into force on March 21, 1994. It was ratified by nearly all of the member states. It stated that governments should gather and share information on global warming and strategies for minimizing its harmful impacts. It also pressured developed nations to reduce their emissions, since they emit the largest percentage of greenhouse gases. Several years later, as the evidence supporting global warming continued to grow, many nations realized that countries' commitment to reducing greenhouse gas emissions needed to be strengthened. On December 11, 1997 the international community produced the Kyoto Protocol, an amendment to UNFCCC, which introduced legally binding targets for countries to meet during the commitment period 2008-2012. By then, the reductions made by individual countries will add up to a 5 percent cut in greenhouse gas emissions from the 1990 levels.

The Kyoto Protocol also introduced emissions trading, which allows countries that exceed their emission quotas to purchase emission credit from countries that are able to stay below their limits. This provides developed countries, which emit large quantities of greenhouse gases, with greater flexibility and gives developing countries an economic incentive to reduce emissions. The agreement entered into force on February 16, 2005 after being ratified by 163 countries.

The 2002 World Summit on Sustainable Development (WSSD), also called Earth Summit 2002 or Rio+10, was held in Johannesburg, South Africa. The first earth summit had been held ten years earlier in Rio de Janeiro, Brazil. At Rio+10, representatives from UN bodies, countries and nongovernmental organizations discussed a wide variety of environmental and sustainable development issues. The Johannesburg Declaration was the main international agreement to come out of the Summit. This declaration asked for the creation of a UN body devoted to sustainable energy.

As a result of the Johannesburg Declaration, the UN-Energy is the principal agency of the UN that focuses on energy-related issues. It was created after the WSSD to help encourage collaboration between UN agencies and other institutions working in the field of sustainable energy. UN-Energy helps to coordinate and support the efforts of a number of other UN agencies such as UNDP, UNESCO, and the IAEA in improving the access to energy services and in creating renewable energy programs in countries around the world.

Agencies such as the UNDP and UNEP see energy as an important aspect of sustainable development and the battle against poverty. Also, the UNDP and UNEP believe that improving the availability and quality of energy around the world is a crucial first step toward achieving the Millennium Development Goals. The UNDP and UNEP does not only help countries by giving money to energy installation projects, it also works to change government policy to favor renewable energy methods and to develop community services that have the knowledge and resources to help poor people gain access to energy.

Issues to Consider

1. What percentage of your MUN country's population lacks access to electricity?

2. What different types of energy does your MUN country use, and in what amounts?

3. Does your MUN country have ideas for increasing the use of renewable energy? What percentage of your MUN country's energy comes from these sources?

4. Did your country ratify the Kyoto Protocol? Have you changed your position since the Copenhagen conference?

5. Is your MUN country an exporter of fossil fuels or any other energy source? Does your MUN country import these products?

6. What are the best and most feasible forms of renewable energy for your MUN country, your region, and the world?

7. What can be done to increase access to basic energy in developing countries?

8. What can be done to transition usage of traditional energy sources to renewable energy sources in developed countries?

9. Who will be responsible? Who will pay for or make sure these solutions occur?

Task

Your task is to research and gather information on this topic and your country's relationship to this topic so you can help resolve the issues related to this topic from your country's perspective. You will be a diplomat representing your country and negotiating solutions that your country can support.

Go to the following link to begin your research:
http://www.un.org/en/sustainablefuture/energy.shtml You can also search online using your MUN ***country's name*** and ***energy*** as key words.