Montana Model UN
High School Conference

General Assembly Second Committee Topic Background Guide

Topic 1: Promoting New and Renewable Sources of Energy[1]

30 September 2013

The General Assembly Second Committee (GA-2) addresses issues related to "economic growth and development such as macroeconomic policy questions…financing for development, sustainable development…and information and communication technologies for development."[2] One of the primary challenges of economic development is securing the energy needed to produce food, generate heat and light, and fuel transportation and industry.

Today, the fossil fuels of petroleum, coal, and natural gas provide 80% of the world's energy. This is unsustainable, for two reasons. First, fossil fuels are renewable only over millions of years, and reserves have been depleted faster than new ones have formed. Second, when fossil fuels are burned to release energy, they emit carbon dioxide (CO_2), methane, and nitrous oxide. These emissions contribute to environmental degradation, including acid rain and mercury-laden water. In addition, they contribute to climate change or the "greenhouse effect," which is increasing temperatures, making weather patterns more severe, and raising sea levels. According to the 2,000 scientists on the Intergovernmental Panel on Climate Change (IPCC), "fossil fuel combustion (plus a smaller contribution from cement manufacture) is responsible for more than 75% of human-caused CO_2 emissions. Land use change (primarily deforestation) is responsible for the remainder."[3]

Individuals, corporations, and states worldwide are striving to find energy resources that are renewable and have limited environmental impact. How can the GA-2 help them to achieve this goal?

History and Current Events

Energy can be produced renewably and non-renewably. Renewable energy sources include solar, wind, and geothermal power, which are available whenever the sun is out, the wind is blowing, or the earth is releasing heat. Hydropower is also renewable, simply requiring water to turn a wheel on a beach or in a river or dam. Biomass requires material from recently-living organisms such as trees, plants, and animals to compost or burn.[4]

Non-renewable energy sources include fossil fuels such as coal, petroleum, and natural gas. Fossil fuels formed over millions of years from plant and animal remains. They are renewable only in the sense that today's

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[1] This background guide was written by Karen Ruth Adams, Montana Model UN faculty advisor, Kedra Hildebrand (2009), and Nicholas Potratz (2013).

[2] UN General Assembly, "Economic and Financial: Second Committee," available at http://www.un.org/ga/second/index.shtml

[3] Intergovernmental Panel on Climate Change (IPCC), "Frequently Asked Questions," *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, 2007, p. 115, available at http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-faqs.pdf See also US Department of Energy, *International Energy Outlook 2013*, DOE/EIA-0484, July 25, 2013, available at http://www.eia.doe.gov/oiaf/ieo/emissions.html

[4] US Energy Information Administration, "Glossary: Renewable Energy Sources," available at http://www.eia.gov/tools/glossary/index.cfm?id=R, accessed 22 July 2013. US Department of Energy, "Learning About Renewable Energy," September 29, 2008, available at http://www.nrel.gov/learning/re_basics.html. Terry Penney and Desikan Bharathan, "Power from the Sea," *Scientific American* 256:1, January 1987: 86-93.

plant and animal remains may form deposits that could be tapped in hundreds of millions of years. Two energy sources – hydrogen fuel cells and nuclear energy -- are more difficult to categorize. Fuel cells are devices that separate hydrogen, the most abundant element on the earth, from other elements and convert it into electricity. Fuel cells require electricity from some other source to operate. Therefore, whether they are renewable or non-renewable depends on their energy they use to carry out the separation.[5] The same is true of nuclear reactors, devices in which enriched uranium or plutonium undergo controlled chain reactions.[6]

According to physicist David J. C. MacKay, until the industrial revolution of the mid-1700s, "the developed world got most of its energy from windmills, from water mills, from whales and from plants."[7] Today, according to statistics from the US Department of Energy (DOE), coal and natural gas account for more than 60 percent of the global electricity supply. These are projected to remain the largest sources through 2030, when they will create 64-percent of the world's electricity generation. Petroleum and other liquid fuels will likely remain the most important sources of energy for transportation. Transportation will continue to use approximately 55-57% of liquid fuels through 2040.[8]

Historically, most of the world's energy consumption has occurred in developed countries. As developing countries have industrialized, however, this has ceased to be the case. In 2010, less than 50 percent of the world's energy consumption occurred in the 30 developed countries that belong to the Organization for Economic Cooperation and Development (OECD). By 2040 the OECD share will fall to 34 percent, as developing countries increase their consumption. As the DOE explains, the most significant increases will occur in China and India:

> China and India continue to lead both world economic growth and energy demand growth. Since 1990, energy consumption in both countries as a share of total world energy use has increased significantly; together, they accounted for about 10 percent of total world energy consumption in 1990 and nearly 24 percent in 2010. From 2010 to 2040, their combined energy use more than doubles … and they account for 34 percent of projected total world energy consumption in 2040. China, which recently became the world's largest energy consumer, is projected to consume more than twice as much energy as the United States in 2040.

It is important to note, however, that energy consumption in most developed countries is falling only in relative terms. For example, the U.S. Energy Information Administration expects US energy consumption to rise 20% over the next 20 years.[9]

Fossil Fuels

Coal is thought to be the most plentiful fossil fuel and has had the longest history of commercial use. Coal has been burned for cooking, heating, and firing clay pots for centuries, including by the Romans in England from 100-200 AD and by the Hopi Indians in North America during the 1300s.[10] In the 1700s, the English found that coal

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[5] US Energy Information Administration, "Glossary: Fuel Cell," available at http://www.eia.gov/tools/glossary/index.cfm?id=F, accessed 22 July 2013.

[6] US Energy Information Administration, "Glossary: Nuclear Reactor," available at http://www.eia.gov/tools/glossary/index.cfm?id=N, accessed 22 July 2013.

[7] David J.C. MacKay, "Illuminating the Future of Energy," *New York Times,* September 1, 2009, available at http://greeninc.blogs.nytimes.com/2009/09/01/illuminating-the-future-of-energy/?scp=5&sq=%22renewable%22%20%22energy%22%20%22history%22&st=cse

[8] US Department of Energy, "World Energy Demand and Economic Outlook," in *International Energy Outlook 2013*.

[9] US Department of Energy, "World Energy Demand and Economic Outlook."

[10] US Department of Energy, "A Brief History of Coal Use," Energy.gov, 12 February 2013, available at http://fossil.energy.gov/education/energylessons/coal/coal_history.html

produced more heat than wood or charcoal (dried wood) and did so more cleanly. During the industrial revolution, coal was used to power steam engines and steam ships. In the second half of the 1800s it was used to make steel and generate electricity.[11] From 1990-2010 the amount of coal burned grew as China and India developed. As a result, the share of coal-related CO_2 emissions worldwide grew from 39 percent to 44 percent. By 2040, this figure is expected to reach 45 percent. In 2010, China and India together accounted for 31 percent of the world carbon dioxide emissions,. Though coal emissions comprise a majority of this increase, petroleum and natural gas are expected to increase as well.[12]

Large scale production of petroleum did not exist until the end of the 19th century.[13] During World War I, when oil-powered ships, trucks, tanks, and airplanes were developed, military strategists began to see oil as a key military asset. The need for oil developed so quickly that in 1917 there was a shortage.[14] In 1960, the Organization of Petroleum Exporting Companies (OPEC) was formed. In the following decades, the world became more dependent on oil and more affected by government changes, international conflicts, and other political and social situations in oil-exporting countries, most of which are in the Middle East.[15] In 2011 the largest consumer of petroleum was the US, followed distantly by China, Japan, Russia and India.[16] The US was also a net importer of fuels until 2011, when the US began exporting more refined fuels due a decrease in domestic use (attributed to the recent economic downturn) and greater demand from external markets.[17] Combustion of petroleum and other liquid fuels is responsible for about 36 percent of CO_2 emissions.[18]

Like coal, natural gas has been used as an energy source for millions of years. One of the earliest records of natural gas goes back to ancient Greece (approximately 1,000 BCE), when a goat herdsman came across a "burning spring," which the Greeks believed to be divine. In 500 BCE, the Chinese were among the first to harness the power of natural gas; they found where it was seeping through the surface of the earth and used bamboo pipelines to carry it to fire pits. Britain used natural gas to light houses and street lights as early as 1785. In 1885, Robert Bunsen created a device that mixed natural gas and air to create a flame that could be used safely in homes; before that, explosions were common.[19] Because natural gas requires pipelines for overland delivery and special ships for transoceanic delivery, it is used less than oil or coal, which can be shipped in barrels and other containers.[20] Natural gas is the cleanest of all fossil fuels. Unlike coal and petroleum, the byproducts of its combustion are just water vapor and small amounts of CO_2. Nevertheless, natural gas combustion is responsible for about 20 percent of

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[11] US Department of Energy, "A Brief History of Coal Use."

[12] US Department of Energy, "Energy-Related Carbon Dioxide Emissions."

[13] US Public Broadcasting System, "Extreme Oil," 2004, available at http://www.pbs.org/wnet/extremeoil/history/index.html.

[14] Bob Ramlow and Benjamin Nusz, *Solar Water Heating*, (New Society Publishers: 2006), 11.

[15] US Public Broadcasting System, "Extreme Oil: 1975-present."

[16] US Energy Information Agency, "Counties," DOE website, available at http://www.eia.gov/countries/index.cfm?view=consumption, accessed 31 July 2013.

[17] Liam Pleven and Russell Gold, "U.S. Nears Milestone: Net Fuel Exporter," *The Wall Street Journal*, 30 November 2011, available at http://online.wsj.com/article/SB10001424052970203441704577068670488306242.html.

[18] US Department of Energy, "Energy-Related Carbon Dioxide Emissions," figure 81.

[19] "History," Natural Gas.org, available at http://www.naturalgas.org/overview/history.asp

[20] Michelle Michot Foss, "Global Natural Gas Issues and Challenges: A Commentary," *Energy Journal* 26:2, 2005: 111.

CO_2 emissions.[21] In addition, natural gas pipelines and plants frequently leak methane. Natural gas is made almost entirely of methane, a greenhouse gas "that scientists say accounts for as much as a third of the human contribution to global warming." Preventing leaks is difficult because natural gas is clear and odorless, requiring infrared cameras to be seen. Russia, the US, Ukraine, and Mexico are thought to emit the largest amounts of methane from oil and gas operations.[22]

The Need for Renewable Energy

Since the 1960s, there have been many calls to replace non-renewable fossil fuels with cleaner, renewable sources. The rationale is two-fold. First, people worry about what will happen when fossil fuels run out. In recent years, discussion has focused especially on "peak oil" – the moment when half of the world's petroleum reserves will have been tapped.[23] Concern with oil is especially acute because petroleum is currently the primary energy source for industry and transportation, especially in the developed OECD countries.[24]

When peak oil is reached will depend on the supply of and demand for oil, both of which can change. Supply, for example, could be enhanced by improved methods of extraction (such as "fracking," in which pressurized fluids and chemicals are pumped into the ground to fracture shale and release oil and natural gas), while demand could be reduced by individuals, states, and corporations switching to other energy sources. Both of these would push the date of peak oil further away. In the US, oil production peaked in 1970. Today, 54 of the 65 largest oil-producing countries have passed their peak, including Indonesia, Australia, the UK, Norway, and Mexico. Scientists and oil corporations disagree about when world petroleum production will peak; most estimates fall somewhere between "already peaked" and 2035.[25] As supplies of non-renewable energy supplies contract, scholars and policy makers worry that states will engage in "resource wars."[26] To lessen their vulnerability to rising prices, supply interruptions, and international conflict, scholars and other experts advise states to develop new and renewable sources of energy.[27]

Second, people are concerned about the environmental effects of fossil fuels. According to the IPCC, "since the start of the industrial era (about 1750), the overall effect of human activities on climate has been a warming influence. The human impact on climate during this era greatly exceeds that due to known changes in natural processes, such as solar changes and volcanic eruptions."[28] As mentioned, fossil fuel combustion accounts for more than 75% of human CO_2 emissions caused by humans. Coal and petroleum are each responsible for about 40 percent of those emissions, with natural gas responsible for another 20 percent. In addition, natural gas leaks contribute to the production of methane, another greenhouse gas. Beyond these effects of fossil fuels on climate are their effects in local areas, for example through acid rain (from burning fossils fuels), mercury contamination in water (from drilling for deposits), and underground and surface water pollution from fracking.

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[21] US Department of Energy, "Energy-Related Carbon Dioxide Emissions," figure 81.

[22] Andrew Revkin and Clifford Krauss, "Curbing Emissions by Sealing Gas Leaks," *New York Times* October 14, 2009, available at http://www.nytimes.com/2009/10/15/business/energy-environment/15degrees.html?_r=1&scp=5&sq=%22natural%20gas%22%20%22environment%22&st=cse

[23] Bart Anderson, "Peak Oil Primer," Energy Bulletin, 16 June 2009, available at http://www.energybulletin.net/primer.php

[24] US Department of Energy, "Liquid Fuels," *International Energy Outlook 2009*, DOE/EIA-0484, May 27, 2009, figure 25, available at http://www.eia.doe.gov/oiaf/ieo/liquid_fuels.html

[25] Anderson, "Peak Oil Primer."

[26] Michael T. Klare, *Resource Wars: The New Landscape of Global Conflict* (New York: Henry Holt, 2002).

[27] Benjamin Schwarz and Christopher Layne, "A New Grand Strategy," *Atlantic*, January 2002.

[28] IPCC, "Frequently Asked Questions," p. 100.

Among the anticipated effects of climate change are higher average temperatures (which will affect agriculture and contribute to fires), more severe weather patterns (such as floods and hurricanes), and rising sea levels. According to the IPCC, more than 634 million people live in coastal regions that could be inundated. "The numbers affected will be largest in the mega-deltas of Asia and Africa while small islands are especially vulnerable. Adaptation for coasts will be more challenging in developing countries than in developed countries, due to constraints on adaptive capacity."[29]

Benefits and Challenges of Renewable Energy

Each renewable energy source has unique benefits and challenges. Overall, however, the benefits are long-term reliability and environmental sustainability, and the challenges are technology development and sharing.

By definition, renewable energy is renewable. Thus, unlike fossil fuels, they are likely to be reliable sources of energy for centuries to come. However, most renewable energies are "naturally replenishing but flow-limited. They are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time."[30] For example, heat from the sun is a renewable resource than can be used directly to heat homes and indirectly (through photovoltaics) to produce electricity, but this energy is available only during daylight hours. By contrast, biomass energy can be produced more steadily by composting plants to produce electricity or liquid fuel. But even so, it is difficult to generate enough biomass for large energy users such as urban electrical plants, mass transportation, and steel production. For renewable energy to be reliable in both the short term and the long term, technological innovations to increase supply or decrease demand are needed.

Renewable energies are also more environmentally sustainable than fossil fuels. For example, solar and wind power create no greenhouse emissions. Yet renewable sources can have harmful environmental effects. For example, solar panels and windmills are currently made from petroleum products. In addition, some wind turbines have reportedly killed thousands of birds each year.[31] Wood burning creates air pollution and produces black carbon, which contributes to climate change as it absorbs rather than reflects heat once it settles on the ground.[32] In China, effort to create dams for hydropower have not only caused mass relocation, but altered its landscape and ecosystem through effects like flooding and water pollution.[33]

According to Frank Laird, an expert on renewable energy, to make the transition to new and renewable energy sources, it is necessary to invest in technological research to improve them, workforce education to produce them, and market development to make it easy for them to be traded and consumed.[34] One of the largest obstacles is technology. Although many ways to harvest energy from renewable resources have been discovered, none is yet as efficient in producing electricity as fossil fuel combustion. For example, wind turbine technology must be improved for areas with low winds.[35] To jump-start development, governments may need to provide financial

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[29] IPCC, "IPPC Fourth Assessment Report: Working Group II, Impacts, Adaptation, and Vulnerability," 2007, p. 12, available at http://www.ipcc.ch/

[30] US Energy Information Administration, "Glossary: Renewable Energy Sources."

[31] Darryl Fears, "Wind farms under fire for bird kills," *The Washington Post*, 28 August 2011, available at http://articles.washingtonpost.com/2011-08-28/national/35269438_1_wind-turbines-wind-farms-wind-power.

[32] Fiona Harvey, "Wood fires fuel climate change – UN," *The Guardian*, 27 November 2011, available at http://www.theguardian.com/environment/2011/nov/27/wood-fires-fuel-climate-change.

[33] Jim Yardley, "Chinese Dam Projects Criticized for Their Human Costs," *New York Times*, 19 November 2007, available at http://www.nytimes.com/2007/11/19/world/asia/19dam.html?pagewanted=all&_r=0.

[34] Frank Laird, "A Full-Court Press for Renewable Energy," *Issues in Science and Technology* 25:2, Winter 2009: 53-56.

[35] Jim Wells, "Advanced Energy Technologies: Key Challenges to Their Development and Deployment: GAO-07-550T," *GAO Reports* February 28, 2007: 2.

incentives such as tax breaks to corporations or invest directly in research and development through public universities.

Another challenge is educating the public, both about the need to use renewable energies and to work in the renewable energy field. Scientists and engineers are needed in all phases of production, from design to manufacture and maintenance. Workers who understand particular renewable energies and have marketing, technical writing, computer, and other skills are also needed.[36] Here again, governments can play an important role through tax incentives and public education.

Perhaps the single greatest challenge is helping developing countries switch to renewable sources instead of relying on fossil fuels. According to the UN, "investment in energy efficiency and low-carbon energy generation [renewable and nuclear energy] will need to increase to between USD 1.7–2.2 trillion per year – compared with present levels of about USD 1.3 trillion – … to meet the combined challenges of energy access, energy security and climate change."[37] African Union leaders have asked for $67 billion annually to improve their efforts to use more renewable resources.[38]

In contemplating the switch to renewable energy, it is important to realize how little energy is used by most people in the world. According to the UN, 1.3 billion people (20% of the world's population) do not have access to electricity, and 40% use burn wood, coal, charcoal, or animal waste to cook their food and heat their homes. This causes deforestation and leads to pollution and health problems; toxic fumes from such fires which kill about 2 million people a year from lung disease. Without electricity, students cannot study at night, people cannot access information through computers, and entrepreneurs have a hard time starting small businesses such as sewing and craft shops.[39] Improvements in less-developed countries are vital to raise living standards and reduce global greenhouse gasses and regional pollution.

To be consequential, efforts to promote the use new and renewable sources of energy in developing countries require significant international assistance in the form of financial aid, trade, and investment, as well as technology transfer. According to the UN Environment Programme Frankfurt School, in 2012, $244 billion was donated to renewable energy source investment.[40] Although this was an $89 billion increase over 2008 levels of funding,[41] according to the World Bank, these sums must be dramatically increased. Even a $16 trillion investment would simply allow use of renewable energy to increase from 2 percent to 3 percent between 2000 and 2030. During that same time, use of coal, oil, and gas would more than double, resulting in "increased deaths and risk of infectious disease, epidemics; increased floods, mudslides and coastal and soil erosion; increased property and infrastructure damage; decreased crops…and a general drop in agriculture productivity."[42]

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[36] Laird, "A Full-Court Press for Renewable Energy."

[37] UN Development Programme, "Derisking Energy Investment," United Nations, 15 April 2013, available at http://www.undp.org/content/undp/en/home/librarypage/environment-energy/low_emission_climateresilientdevelopment/derisking-renewable-energy-investment/.

[38] MacFarquhar. "U.N. Reports on Developing Nations' Energy Needs."

[39] Sustainable Energy for All, "Universal Access," available at http://www.sustainableenergyforall.org/objectives/universal-access, accessed 26 July 2013.

[40] Frankfurt School UNEP Collaborating Center, "Global Trends in Renewable Energy Investment 2013," available at http://fs-unep-centre.org/publications/global-trends-renewable-energy-investment-2013, accessed 31 July 2013.

[41] UN News Centre, "Clean Energy Takes Lion's Share of Funding from Fossil Fuels in 2008," June 3, 2009, available online at http://www.un.org/apps/news/story.asp?NewsID=31010

[42] World Bank, "World Bank Plan of Action for Renewable Energy and Energy Efficiency: Submitted to UN Energy," UN Energy.org, May 3, 3005, available at http://esa.un.org/un-energy/mapping/World%20Bank%20RE.htm

In recent years the UN has encouraged developed countries to transfer renewable energy technology to developing countries at discounted prices. But such transfers have been limited because corporations in developed countries have been concerned with protecting the intellectual property rights, such as copyrights and patents, that enable them to charge more for energy-related software and hardware than most developing states can afford. According to the UN Department of Economic and Social Affairs (DESA), although the recent Trade-Related Aspects of Intellectual Property Rights Agreement calls attention to the need for property rights law to be implemented with consideration of environmental, public health, and development goals, the agreement allows patent holders to restrict the use of patented technology for such purposes.[43] Developed states hold the majority of clean energy patents; less than 1% of clean energy patents were developed in Africa.[44]

Since 2011, when an earthquake and tsunami severely damage a Japanese nuclear plant and exposing people, soil, and water to radiation, it has been clear that developed countries, too, face many energy challenges.[45] For example, although Germany aims to shut down its nuclear plants by 2022 and shift "almost entirely" to wind and solar by 2050, it is unclear whether and how it will achieve those goals.[46]

Previous Committee Work on This Topic

Moving the world from fossil fuels to renewable energy sources is both vital and challenging. Due to the non-renewable nature of fossil fuels and their environmental impacts, the question is not whether the transition should occur but how it can be speeded and smoothed. Issues include research, financing, training, and technology development. Moreover, these issues must be addressed in a way that allows developing countries to improve their living standards. According to the UN Development Programme,

> None of the Millennium Development Goals (MDGs) can be met without major improvement in the quality and quantity of energy services in developing countries. UNDP's efforts in energy for sustainable development support the achievement of the MDGs, especially MDG 1, reducing by half the proportion of people living in poverty by 2015. Through an integrated development approach, UNDP works to help create enabling policy frameworks, develop local capacity and provide knowledge-based advisory services for expanding access to energy services for the poor.[47]

Much of the UN's work on energy has been geared toward reduction of CO_2 emissions. The most comprehensive agreement regarding greenhouse gas emissions is the Kyoto Protocol to the 1992 UN Framework Convention on Climate Change (FCCC). In the Protocol, which was signed in 1997, 150 states agreed to adopt specific national greenhouse gas emission targets for 2012. [48] In December 2012, as a reaction to the recognized failure of the 2012 Kyoto targets, the United Nations Climate Change Conference in Doha, Qatar made further steps

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[43] UN Department of Economic and Social Affairs, "Climate Change: Technology Development and Technology Transfer," United Nations, 2008, http://sustainabledevelopment.un.org/content/documents/1465back_paper.pdf.

[44] UN Environment Programme, "Under One Per Cent of Clean Energy Technology Patents Filed in Africa Highlighting Huge Potential for Exploiting Renewable Sources," UNEP News Centre, available at http://www.unep.org/newscentre/default.aspx?DocumentID=2716&ArticleID=9502&l=en.

[45] Nassrine Azimi, "When Nature is Not Enough," *New York Times*, 7 May 2013, http://www.nytimes.com/2013/05/08/opinion/global/Japans-Shift-From-Nuclear-Energy.html

[46] Melissa Eddy and Stanley Reed, "Germany's Effort at Clean Energy Proves Complex," New York Times, 18 September 2013, http://www.nytimes.com/2013/09/19/world/europe/germanys-effort-at-clean-energy-proves-complex.html

[47] UNDP, "Energy for Sustainable Development: Overview," available at http://www.undp.org/energy/

[48] United Nations, "Kyoto Protocol to the United Nations Framework Convention on Climate Change," 1998, Article 3 and Article 6, available at http://unfccc.int/resource/docs/convkp/kpeng.pdf

by bringing consensus on a second extended period under the Kyoto Protocol from 2013 to 2020. States hope to finalize the 2020 extension by 2015 through future conferences,[49] such as the November 2013 conference in Warsaw.[50]

The FCCC was one of many agreements that came out of the 1992 UN Conference on Environment and Development (UNCED), also known as the "Earth Summit." The main document, "Agenda 21," continues to govern UN policy related to energy and sustainable development. For example, in Resolution A/S-19/29 (1997), the GA adopted a "Programme for the Further Implementation of Agenda 21," which contained several points related to energy (items 42-46). In particular, it called for efforts to promote research and development and share technologies with developing countries.[51] These principles were affirmed at the GA-sponsored World Summit on Sustainable Development (WSSD) in Johannesburg in 2002.[52] Since then, the UN's focus has shifted to developing efficient and environmentally sustainable energy technology, as well as transferring such technology to developing states.

In 2004 the United Nations established UN-Energy, an organization that brought a number of UN organizations to facilitate and achieve the goals of the WWSD. The core idea behind UN-Energy is that developing energy, particularly renewable energy, requires a multidisciplinary approach. Thus, the program works to create systems for agencies to share information, develop joint programming, and coordinate agencies actions. UN-Energy has three branches: *energy access*, led by the UN Department of Economic and Social Affairs, the UN Development Programme, and the World Bank; *renewable energy*, led by the Food and Agricultural Organization, the UN Environment Programme, and the UN Education, Social, and Cultural Organization; and *energy efficiency*, led by the UN Industrial Development Organization and the International Atomic Energy Agency.[53]

In December 2010, the GA adopted A/RES/65/151, which declared 2012 as the International Year of Sustainable Energy for All. During 2012, Member States and UN organizations implemented programs to educate people, businesses, and organization on sustainable development, the MDGs, climate change, and new technologies at local, national, regional, and international levels.[54] UN Secretary-General Ban Ki-Moon has since launched an initiative also using the name Sustainable Energy for All. The initiative aims at "providing universal access to modern energy services, doubling the global rate of improvement in energy efficiency, and doubling the share of renewable energy in the global energy mix" by 2030. According to the Secretary-General and his High-Level Panel, the initiative has attained over 100 commitments from governments, businesses, IGOs, and NGOs. For instance, businesses have contributed over $50 billion dollars to sustainable energy, and the EU has committed to provide 500 million people with energy services, beginning with a €50 million (about $66 million) assistance fund.[55]

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[49] John Broder, "Climate Talks Yield Commitment to Ambitious, but Unclear, Actions," *New York Times*, 8 December 2012; [newspaper online]; available at http://www.nytimes.com/2012/12/09/science/earth/talks-on-climate-produce-promises-and-complaints.html?ref=kyotoprotocol.

[50] United Nations Framework Convention on Climate Change, "Warsaw Climate Change Conference – November 2013," available at http://unfccc.int/meetings/warsaw_nov_2013/meeting/7649.php, accessed 25 July 2013.

[51] UN General Assembly, "Programme for the Further Implementation of Agenda 21," Resolution A/S-19/29 (1997), available at http://www.un.org/documents/ga/res/spec/aress19-2.htm

[52] Johannesburg Plan of Implementation (2002), see especially "III. Changing unsustainable patterns of consumption and production," SIDSnet website, available at http://www.sidsnet.org/sites/default/files/resources/jpoi_l.pdf.

[53] United Nations, "About UN-Energy," UN Energy Knowledge Network, available at http://www.un-energy.org/about, accessed 24 July 2013.

[54] UN Secretary-General "Report on the International Year of Sustainable Energy for All, 2012," UN General Assembly, August 2012, available at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N12/465/39/PDF/N1246539.pdf?OpenElement.

[55] UN Secretary-General, "Report on Sustainable Energy for All," UN General Assembly, 2 November 2012, available at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N12/571/44/PDF/N1257144.pdf?OpenElement.

In 2012, the GA-2 submitted a report the UN General Assembly called *Sustainable Development: Promotion of New and Renewable Sources of Energy*. The GA-2 suggested that the GA adopt a resolution that would declare 2014-2024 the Decade of Sustainable Energy of All. It further suggested that Member States increase the amount of renewable energy sources used in the world by making renewable energy more efficient and affordable, and requested that donors use technical and financial assistance to bolster international efforts at providing energy to everyone as a means of promoting development and meeting goals like eradicating poverty.[56] The UN General Assembly adopted the suggested resolution in December 2012.[57]

In 2013, the UN General Assembly adopted A/RES/67/263 emphasizing the need to improve energy transportation, for example by building new pipelines. The resolution also called for states to attend the High-Level Conference on Reliable and Stable Transit of Energy taking place early 2014 in Turkmenistan, the first conference on transportation since 2009.[58]

Conclusion

Humans have not always relied on fossil fuels, and it is possible that future generations will once again live without them, reducing economic disruptions and environmental damage. But change requires concerted action. How can the GA-2 encourage states to take the action and make the financial commitment to change energy consumption patterns to stabilize the world economy and environment for future generations? In researching and writing your country's position on this issue, consider the following questions:

-- What are your country's major energy sources? Consider the specific fossil fuels and alternative energies that it produces and consumes.
-- Has your country invested in renewable energy technology? Which renewable energies would be most effective for your country? What are the most important barriers to their further adoption?
-- What are your country's CO_2 emissions? Has it been successful in reducing them? Is it a party to the Kyoto Protocol? Is it participating in the UN Warsaw Climate Change Conference?
-- Has your country received or given international assistance in developing renewable energy sources? Is it interested in receiving or offering aid, trade, investment, or technology transfers?
-- How can the GA-2 encourage states to invest in and use new and renewable sources of energy? How should the costs and benefits of this change be distributed so that both developed and less-developed countries can benefit?

Recommended Reading

Eddy, Melissa and Stanley Reed. Germany's Effort at Clean Energy Proves Complex," *New York Times*. 18 September 2013. Available at http://www.nytimes.com/2013/09/19/world/europe/germanys-effort-at-clean-energy-proves-complex.html

This recent article describes the governmental and personal challenges Germany is facing in attempting to reduce reliance on nuclear energy and move to all renewables.

[56] UN General Assembly Second-Committee Report A/67/437/Add.9 (2012), available at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N12/648/03/PDF/N1264803.pdf?OpenElement.

[57] UN General Assembly Resolution 67/215 (2013), available at http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/67/215.

[58] UN General Assembly Resolution 67/263 (2013), available at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N12/494/38/PDF/N1249438.pdf?OpenElement.

Leahy, Stephen. "'Fracking' for Shale Gas: Neither Clean nor Green." Tierramerica. 5 December 2011. Available at http://www.earthworksaction.org/media/detail/fracking_for_shale_gas_neither_clean_nor_green#.UfMmZI3OsW4.

This article provides a description of the process and prospects of hydraulic fracturing or "fracking," and discusses its impacts on the environment.

United Nations. "Gateway to the UN System's Work on Climate Change: Examples of UN Projects." Available at http://www.un.org/wcm/content/site/climatechange/pages/gateway/adaptation/examples-of-adaptation.

This website provides examples of UN work on renewable energy projects.

UN Department of Economic and Social Affairs. "Climate Change: Technology Development and Technology Transfer." UN-Energy. 2008. Available at http://www.un-energy.org/publications/173-climate-change-technology-development-and-technology-transfer.

This report details energy technology and technology transfer, including barriers and prospective solutions to transferring technology. See the executive summary and Part II, as well as the section on Intellectual Property Rights and possible solutions in Part III.

UN-Energy. "UN-Energy Knowledge Network." Available at http://www.un-energy.org/ (accessed 25 Juy 2013).

This site features recent news on international and United Nations actions in regard to energy. It also features information about existing UN energy activities and organizations, and helpful in the three major areas of Energy Acess, Renewable Energy, and Energy Efficiency.

UN Environment Programme (2013). "Renewables 2013 Global Status Report." Available at http://www.unep.org/pdf/GSR2013.pdf.

The report provides a great deal of valuable information on energy markets, technologies, and policies. Pay particular attention to Chapters 4 and 6 on policies and challenges around the world.

UN Secretary-General. "Sustainable Energy for All." UN General Assembly. 2 November 2012. Available at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N12/571/44/PDF/N1257144.pdf?OpenElement.

This document provides an overview of the Secretary-General's initiatives and lists actions taken by states, businesses, international organizations, and non-governmental organizations. It also discusses actions that can have a significant impact in improving energy and actors engaged in those areas. For more information, see footnote 39.