



*The Development of a Framework for the Stability and Sustenance of
Fossil Fuels and their Transition into Renewable Energy*

General Assembly Study Guide



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Letter from the President

Honorable Delegates,

My name is Tereza Michalková and it is my great pleasure to be the first-ever President of the General Assembly at the upcoming 2016 Zilina Model United Nations Conference. I am currently a senior at the International School of Athens where I will obtain my International Baccalaureate Diploma this year. I will continue my studies in the path of International Relations and International Law at Durham University. I have been an active member of the ZAMUN Dais team since 2014, as well as a delegate at various other conferences. I have a deep rooted interest in the international spectrum, and I hope to share it during our session time.

The General Assembly will possibly be your best experience from ZAMUN 2016, not only because I'm presiding over it, but also because you will have to learn how to work as a team with the fellow delegate of your country as well as with delegates of other countries in order to reach consensus. While I am and will be very outgoing, both inside and outside of the committee, as your Chair I have certain expectations. The first of which is that you will have an applicable understanding of parliamentary procedure. This simply means that, even though I don't expect you to be experts on the subject, I do expect you to have enough of an understanding of the topic as well as of the parliamentary procedure to allow the General Assembly to work smoothly and effectively. Before coming to the conference, I expect to receive one Policy Statement of your country on which you are expected to work together with the other delegates representing your country. Also, know how to draft a resolution properly. Be aware of the content, as well as the language, that is necessary for a working paper to be properly submitted. Lastly, maintain decorum at all times. These things are important to me, and should be important to you if you are truly interested in Model United Nations. As you only have a day and a half to conduct as much business as possible, it is imperative that you come prepared and ready to go straight into debate.

On a final note, a complete Study Guide to the General Assembly has been uploaded on the ZAMUN 2016 website. This is a good start for you to begin researching on the selected topic. Suggestions for further reading are attached at the end of the document. However, you are expected to do further research on the topic. Please be sure to do so, and once again, come prepared and ready to go straight into debate.

If you have any questions or concerns, please do not hesitate to contact me. I promise I will work with you to the best of my abilities. The e-mail at which I will be available is tmichalkova@students.isa.edu.gr. I hope that everyone is as excited about this conference as I am, and wish you to know that what you are doing is extremely important in helping to make our world a more united and cohesive place.

The deadline for GA Personal Statements is: 30.3.2016

Send Policy Statements to: tmichalkova@students.isa.edu.gr

United Nations General Assembly (UNGA)

The General Assembly, comprised of all 193 Members of the United Nations, provides a unique forum for multilateral discussion of the full spectrum of international issues covered by the Charter. It is the main deliberative, policymaking and representative organ of the UN. Decisions on important questions, such as those on peace and security, admission of new members and budgetary matters, require a two-thirds majority. Decisions on other questions are by simple majority.

Each country has one vote. Some Member States in arrear of payment may be granted the right to vote.

Furthermore, the Assembly has adopted its own rules of procedure and elects its President for each session.¹

Introduction to the Topic

Carbon dioxide (CO₂) is one of a number of gases that are transparent to the visible light falling on the Earth from the sun, but absorb the infra-red radiation (heat) emitted by the warm surface of the Earth, preventing its loss into space. During the geological history of the Earth, the level of atmospheric CO₂ has varied considerably and this has had an impact on the global temperature. A significant amount of this atmospheric carbon was sequestered (removed from the atmosphere) and turned into inert material (coal, and oil) about 300-360 million years ago, known as fossil fuels.²

Starting with the industrial revolution, humans have been burning sequestered CO₂ in the form of coal, oil, and natural gas which has the result of releasing energy but also releases CO₂ back into the atmosphere. Therefore, the primary cause of global warming is human activity, most significantly the burning of fossil fuels to drive cars, generate electricity, and operate our homes and businesses.

The increase of atmospheric CO₂ and other gasses has the effect of changing the global climate back towards the point when they were originally sequestered. Furthermore, the rapidity of the change (about 200 years) is having additional impacts. This period of time is extremely short in context of the global climate and is not much more than a single generation for some long lived species leaving them very little time to adapt. Overloading our atmosphere with carbon has far-reaching effects on all the inhabitants of the Earth, including rising sea levels, increasing wildfires, more extreme weather, deadly heat waves, more severe droughts and the possible extinction of plant and animal species due to habitat loss.³

The ever-growing human population implies increased demand for energy. However, the limited sources of fossil fuels rapidly diminish. At the present rate of consuming the equivalent of over 11 billion tons of oil in fossil fuels per annum⁴, crude oil reserves are vanishing unimaginably fast. It has been estimated that oil will run out in 53 years, natural gas in 54, and coal in 110.⁵ Fossil fuels are an incredibly dense form of energy, and they took millions of years to become so. Once they are gone, they will be gone forever.

Rigorous regimes have been put into place to implement renewable energy to meet global energy standards for a sustainable future. Relying on fossil fuels alone may cause a giant leap backwards in modern development and deter technological advancements in the respective field. Also, the excessive incineration of fossil fuels all around the world plays a major role in the act of global warming. Due to this very reason, renewable energy has attracted much attention over the past years as a subject of global interest and energy solution towards stability. As the awareness for

²http://www.biomassenergycentre.org.uk/portal/page?_pageid=76,539186&_dad=portal&_schema=PORTAL

³http://www.biomassenergycentre.org.uk/portal/page?_pageid=76,539186&_dad=portal&_schema=PORTAL

⁴ ~~<https://www.ecotricity.co.uk/our-green-energy/energy-independence/the-end-of-fossil-fuels>~~

⁵ http://www.business-standard.com/article/punditry/how-long-will-fossil-fuels-last-115092201397_1.html

environmental concerns regarding electric power generation manifested across nations, many governments have shown great strides in energy efficiency by providing large financial incentives to proactively gain power generation through renewable means. A large percentage of private sector firms are now devoting their financial resources towards renewable energy, embracing the transition towards a sustainable energy future.

Despite numerous conferences discussing these environmental issues which resulted into documents such as countless resolutions of the United Nations Environmental Programme (UNEP) and the Kyoto Protocol, many nations fail to shift towards more ecological energy production and use, including the United States of America. The major obstacle for such nations seem to be high costs which accompany the programme's implementation. However, the long-term benefits far outweigh the initial costs regarding production.

Living in the 21st century, we have the technological knowledge and ability to use our natural environment to discover and put into use energy sources which are much more efficient and much less harmful to the environment than fossil fuels. It is essential that nations act together and responsibly in this issue that concerns the whole of mankind. Only through an international agreement which will imply universal policies can this serious issue be tackled.

Key Terms

In order to be able to debate productively on the topic, all delegates must be familiar with at least the key terms provided.

Fossil Fuels

Fossil fuels are hydrocarbons, primarily coal, fuel oil or natural gas, formed from the remains of dead plants and animals. In common dialogue, the term fossil fuel also includes hydrocarbon-containing natural resources that are not derived from animal or plant sources. There are three major forms of fossil fuels: coal, oil and natural gas. The utilization of fossil fuels has enabled large-scale industrial development and largely supplanted water-driven mills, as well as the combustion of wood or peat for heat. 'Fossil fuel' is a general term for buried combustible geologic deposits of organic materials, formed from decayed plants and animals that have been converted to crude oil, coal, natural gas, or heavy oils by exposure to heat and pressure in the earth's crust over hundreds of millions of years.⁶

Renewable energy

The term 'renewable energy' refers to energy coming from a natural source such as wind, water, the sun and nuclear sources of energy. There are many forms of renewable energy. Most of these renewable energies depend in one way or another on sunlight. Wind and hydroelectric power are the direct result of differential heating of the Earth's surface which leads to air moving about (wind) and precipitation forming as the air is lifted. Solar energy is the direct conversion of sunlight using panels or collectors. Biomass energy is stored sunlight contained in plants. Other renewable energies that do not depend on sunlight are geothermal energy, which is a result of radioactive decay in the crust combined with the original heat of accreting the Earth, and tidal energy, which is a conversion of gravitational energy.⁷

Energy Conversion

Energy conversion is the process of transforming energy from one form into another. Energy in many of its forms may be used in natural processes, or to provide some service to society such as heating, refrigeration, light, or performing mechanical work to operate machines. For example, a solar cell converts the radiant energy of sunlight into electrical energy that can then be used to light a bulb or power a computer.⁸

Weather vs. Climate

Weather is the changes we see and feel outside from day to day. It might rain one day and be sunny the next. Weather changes from place to place.

Climate is the usual weather of a place. Climate can be different for different seasons. A place might be mostly warm and dry in the summer. The same place may be cool and wet in the winter. Different places can have different climates. Earth's

⁶ http://www.sciencedaily.com/terms/fossil_fuel.htm

⁷ <http://www.altenergy.org/renewables/renewables.html>

⁸ https://en.wikipedia.org/wiki/Energy_transformation

climate is what you get when you combine all the climates around the world together.⁹

Climate change

Climate change is a change in the usual weather found in a place. This could be a change in how much rain a place usually gets in a year. Or it could be a change in a place's usual temperature for a month or season. Climate change is also a change in Earth's climate. This could be a change in Earth's usual temperature. Or it could be a change in where rain and snow usually fall on Earth. Weather can change in just a few hours. Climate takes hundreds or even millions of years to change.

Global Warming

Global warming is the gradual heating of Earth's surface, oceans and atmosphere. Scientists have documented the rise in average temperatures worldwide since the late 1800s. Earth's average temperature has risen by 1.4 degrees Fahrenheit (0.8 degrees Celsius) over the past century, according to the Environmental Protection Agency (EPA). Temperatures are projected to rise another 2 to 11.5 degrees F (1.133 to 6.42 degrees C) over the next 100 years. Most of the leading scientific organizations in the world acknowledge the existence of global warming as fact, according to a NASA report. Furthermore, 97 percent of climate scientists agree that the rate of global warming trends the planet is now experiencing is not a natural occurrence, but is primarily the result of human activity. That consensus was made clear in a major climate report released Sept. 27, 2013, by the Intergovernmental Panel on Climate Change (IPCC). In that report, climate scientists indicated they are more certain than ever of the link between human activities and global warming.¹⁰

Greenhouse effect

The "greenhouse effect" is the warming that happens when certain gases in Earth's atmosphere trap heat. These gases let in light but keep heat from escaping, like the glass walls of a greenhouse. First, sunlight shines onto the Earth's surface, where it is absorbed and then radiates back into the atmosphere as heat. In the atmosphere, "greenhouse" gases trap some of this heat, and the rest escapes into space. The more greenhouse gases are in the atmosphere, the more heat gets trapped.¹¹

Greenhouse Gases

Human-caused global warming occurs when human activity introduces too much of certain types of gas into the atmosphere. More of this gas equals more warming. The atmospheric gases primarily responsible for the greenhouse effect are known as "greenhouse gases" and include water vapor, carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). The most prevalent greenhouse gas is CO₂. CO₂ makes its way into the atmosphere through a variety of routes. Burning fossil fuels, for

⁹ <http://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-is-climate-change-k4.html>

¹⁰ <http://www.livescience.com/37003-global-warming.html>

¹¹ <http://environment.nationalgeographic.com/environment/global-warming/gw-overview/>

example, releases CO₂. Deforestation is also a large contributor to excessive CO₂ in the atmosphere.¹²

Sustainability

The progression of civilization including economies and quality of life is important, however at the same time sustaining natural resources and our environment is crucial. Sustainability includes sustainable building, design and operations. Sustainability is the collection of policies and strategies employed by companies to minimize their environmental impact on future generations. Ecological concerns, such as the environmental impact of pollutants, are balanced with socio-economic concerns such as minimizing the consumption of limited natural resources to maintain their availability for the future.¹³

¹² <http://www.livescience.com/37003-global-warming.html>

¹³ <http://www.environmentalleader.com/category/sustainability/#ixzz3x3EW9iY9>

Key Issues

Limited Resources of Fossil Fuels

Started by the invention of the steam engine in the 18th century, the consumption of fossil fuels by humans has rose exponentially. Regardless of great scientific and technological advancement, we continue to use burning of fossil fuels are the primary and main source of energy, notably mainly because of its favorable costs. This trend is, however, becoming very dangerous as many recent studies have produced findings of rapidly diminishing resources of these fossil fuels. It has been estimated that oil and natural gas reserves will be empty by 2070 and coal reserves won't last for longer than 100 years (given that consumption will continue at present rates and not rise due to increase in population).

Impact of Burning of Fossil Fuels

Human health problems caused by air pollution from the burning of coal and oil; damage to land from coal mining and to miners from black lung disease; environmental degradation caused by global warming, acid rain, and water pollution; and national security costs, such as protecting foreign sources of oil. Since such costs are indirect and difficult to determine, they have traditionally remained external to the energy pricing system, and are thus often referred to as externalities. And since the producers and the users of energy do not pay for these costs, society as a whole must pay for them. But this pricing system masks the true costs of fossil fuels and results in damage to human health, the environment, and the economy.¹⁴

The Failure to Transition to Renewable Energy

In spite of countless measures taken by the international institutions, in reality the majority of nations still fails to shift towards more ecological energy production. What seems to be the issues are the high costs which accompanying the programme's implementation. However, the long-term benefits far outweigh the initial costs regarding production.

World Financial Crisis

The unprecedented scale of the global recession at the end of the decade has led to significant reductions in energy investment worldwide. Energy investment has plummeted for two main reasons: First, a drop in fuel prices, due to weakened demand, makes investment less attractive. Secondly, the financial crisis has restricted energy companies' access to credit. The first factor is particularly evident in the oil and gas sector, where the collapse in prices has starved companies of cash flow which could be used to finance capital spending. Upstream investment has been hit hardest, with the most pronounced effect in the regions with the highest development costs and where the industry is dominated by small players and small projects. This implies investment in non-OPEC countries will drop the most. Investment in the power and coal sectors also declined significantly, the latter by 40% in 2009 compared with 2008. Investment in renewable energy projects in the

¹⁴ http://www.ucsusa.org/clean_energy/our-energy-choices/coal-and-other-fossil-fuels/the-hidden-cost-of-fossil.html#.VpU5ZRWLTIU

US has slowed down more quickly than in EU-Europe, where wind and solar projects - especially in Spain - have continued to be financed. Asset Finance investment in China has also fallen, but the government is taking an increasingly active role to support a rapidly growing industry through domestic demand for products. New-build asset finance in Brazil has given way to refinancing as state-owned banks move to fill the financing gap left by private sector banks, particularly in the ethanol sector. Tighter credit and lower prices make investment in energy savings less attractive, and thus investment in renewable energy is expected to decline even further as well. However, some government stimulus packages may counter this trend by providing incentives for the production of renewable energy.¹⁵

¹⁵ http://www.resourcegovernance.org/training/resource_center/impact-financial-and-economic-crisis-global-energy-investment-0

Key Parties and Nations Involved

United Nations Environment Programme (UNEP)

The United Nations Environment Programme is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system and serves as an authoritative advocate for the global environment.

UNEP work encompasses:

- Assessing global, regional and national environmental conditions and trends
- Developing international and national environmental Instruments
- Strengthening institutions for the wise management of the environment
- Mission: "To provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations."¹⁶

UN-Energy

UN-Energy was initiated as a mechanism to promote coherence within the United Nations family of organizations in the energy field and to develop increased collective engagement between the United Nations and other key external stakeholders. Its envisaged role was to increase the sharing of information, encourage and facilitate joint programming and develop action-oriented approaches to coordination. It was hoped that it would develop into a system-wide network open to all and a mechanism by which a range of organizational actors could work with the United Nations to ensure a more coherent approach to addressing energy issues.¹⁷

International Energy Agency (IEA)

The IEA is an autonomous organisation which works to ensure reliable, affordable and clean energy for its 29 member countries and beyond. The IEA has four main areas of focus: energy security, economic development, environmental awareness and engagement worldwide. An autonomous organisation, the IEA examines the full spectrum of energy issues and advocates policies that will enhance the reliability, affordability and sustainability of energy in its 29 member countries and beyond.¹⁸

European Union (EU)

Individual EU countries have different available resources and their own unique energy markets. This means that they will have to follow distinctive paths when it comes to meeting their obligations under the Renewable Energy Directive, including their legally binding 2020 targets.¹⁹

¹⁶ <http://www.unep.org/about/>

¹⁷ <http://www.un-energy.org/what-is-un-energy>

¹⁸ <http://www.iea.org/aboutus/>

¹⁹ <https://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans>

Read more on specific national policies:
<https://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans>

United States of America

The United States is set to become the world's number one producer of oil and gas combined. But since the oil crises of the 1970s, U.S. energy policy has been based, either implicitly or explicitly, on the assumption of scarcity of U.S. resources. This has resulted in strong support for open and transparent global energy markets, which are expected to reduce volatile (and high) prices for U.S. customers and enable U.S. companies to access foreign energy supplies. What policy makers now have to reckon with is what the re-discovery of a bounty of domestic supplies (of oil and gas) means for U.S. energy policy, at home as well as abroad.²⁰

China

China is already the world's biggest investor in renewables - and it is very much open for international business. China has switched to a low-carbon model for development. The country that became famous, or infamous, for building a coal-fired power station a week is now increasingly turning its back on the fuel. China seems to have passed its "peak coal" last year, when use fell by 2.9 per cent, and the trend seems to be accelerating: in the first four months of this year it burned a substantial 8 per cent less than in the equivalent period in 2014. Renewables, by contrast, are booming. China's wind power capacity has soared more than 70 fold in decade, while its solar capacity has multiplied more than 300 times over in just the last five years. Over the next five, it plans to more than double again the amount of wind, and almost treble the amount of solar.²¹

Russia

Russia's current electricity generation portfolio is estimated at more than 220 GW installed capacity, of which 68 percent is thermal (oil, gas, coal). Some forecasts predict that Russian gas supply could, without significant additional upstream investment, fall short of projected domestic and export demand within the next few years. Despite the quadrupling in the domestic tariff for natural gas between 1999 and 2006, domestic gas consumption has continued to grow.

Average domestic gas consumption during the same time span increased by 1.7 percent annually. The current annual growth rate is 2.5 percent. To meet increasing electricity demand, over the next two to four years Russia will need to add a minimum of 20,000 MW of new generating capacity. There is a growing realization by Russia's policy makers and the private sector that increased use of energy efficient and renewable energy technologies can help meet the growing demand for energy resources. The Energy Strategy of Russia until 2020 sets the target for installed renewable electricity generation to 4.5 percent by 2020.²²

²⁰ <http://www.ourenergypolicy.org/should-us-energy-policy-aim-for-stability-or-leverage-in-global-energy-markets/>

²¹ <http://www.telegraph.co.uk/news/earth/energy/11942200/Its-renewable-energy-where-the-Chinese-can-really-help-us.html>

²² http://www.ifc.org/wps/wcm/connect/RegProjects_Ext_Content/ifc_external_corporate_site/home-rrep

Australia

Non-renewable fossil fuels (crude oil, natural gas, coal, oil shales and tar sands) currently supply Australia with more than 95 percent of our electrical energy needs. Fossil fuels, such as coal, oil and gas are abundant in Australia so this means they are a relatively cheap fuel and readily available. Australia has enough fossil fuel resources to last for hundreds of years. Also very large amounts of electricity can be generated from fossil fuels.²³

Key Conferences and Documents

Kyoto Protocol

The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change, which commits its Parties by setting internationally binding emission reduction targets. Recognizing that developed countries are principally responsible for the current high levels of GHG emissions in the atmosphere as a result of more than 150 years of industrial activity, the Protocol places a heavier burden on developed nations under the principle of "common but differentiated responsibilities." The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. The detailed rules for the implementation of the Protocol were adopted at COP 7 in Marrakesh, Morocco, in 2001, and are referred to as the "Marrakesh Accords." Its first commitment period started in 2008 and ended in 2012.

In Doha, Qatar, on 8 December 2012, the "Doha Amendment to the Kyoto Protocol" was adopted. The amendment includes:

New commitments for Annex I Parties to the Kyoto Protocol who agreed to take on commitments in a second commitment period from 1 January 2013 to 31 December 2020;

A revised list of greenhouse gases (GHG) to be reported on by Parties in the second commitment period; and

Amendments to several articles of the Kyoto Protocol which specifically referenced issues pertaining to the first commitment period and which needed to be updated for the second commitment period.²⁴

Lima 2014

In 2014, COP20 held in Lima attracted over 15,000 official delegates, and negotiators concluded talks with the 'Lima Call For Climate Action', a draft document that lays the foundations for a new global climate deal.

Alongside COP20, there were more than 400 conferences in which new research projects and initiatives were presented. The Sustainable Innovation Forum 2014 was the largest commercially-focused event during COP20, attracting high profile speakers, celebrities and over 500 pre-approved delegates representing private sector, government, NGO, UN agencies and civil society. During the two weeks of COP20, over 140 press conferences were held and more than 900 journalists from around the world covered the international event.

Paris 2015

The 2015 United Nations Climate Change Conference, COP 21 or CMP 11 was held in Paris, France, from 30 November to 12 December 2015. It was the 21st yearly session of the Conference of the Parties (COP) to the 1992 United Nations Framework Convention on Climate Change (UNFCCC) and the 11th session of the Meeting of the Parties to the 1997 Kyoto Protocol. The conference negotiated the Paris Agreement, a global agreement on the reduction of climate change, the text of

which represented a consensus of the representatives of the 196 parties attending it. The agreement will become legally binding if joined by at least 55 countries which together represent at least 55 percent of global greenhouse emissions. Such parties will need to sign the agreement in New York between 22 April 2016 (Earth Day) and 21 April 2017, and also adopt it within their own legal systems (through ratification, acceptance, approval, or accession).

Further Reading

http://www.unep.org/pdf/dtie/Study_Financial_Crisis_impact_on_RE.pdf

http://www.biomassenergycentre.org.uk/portal/page?_pageid=76,539186&_dad=portal&_schema=PORTAL

<http://theweek.com/articles/545167/end-coal>

<http://www.altenergy.org/transition/transition.html>

<http://www.greenpeace.org/international/Global/international/briefings/climate/COP20/A-just-transition-to-100-renewable-energy.pdf>

<http://ecowatch.com/2015/10/01/fossil-fuels-renewable-energy/>

http://fs-unep-centre.org/sites/default/files/attachments/key_findings.pdf