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BACKGROUND GUIDE Council on Energy Affairs

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Topic 1: Considering the role of regional developments in nuclear energy with special attention given to its role in energy security and defense.

I. Introduction to the Topic

A. General Background

Nuclear energy is playing an increasingly prominent role in Middle Eastern affairs, particularly in light of Iran's nuclear program and anxiety over the security of Pakistan's nuclear arsenal. In addition, many Arab states have publicly stated their intents to develop nuclear energy programs to sustain the process, and several have projects already underway [1]. Indeed, nuclear power plants are arguably a cost effective and relatively environmentally friendly way to produce energy and diversify energy sources. However, there are deep concerns among both regional players and the broader international community that such programs can be weaponized, enabling the construction of nuclear weapons and threatening regional security. There are also fears regarding the safety of nuclear power plants, particularly in light of the Fukushima disaster, as well as concerns over the storage of nuclear waste [4].

For the purposes of this topic, "energy security" is defined as the ability of a country to maintain affordable and reliable access to the resources needed to meet its energy needs (e.g. diversification of energy sources, such as building solar and nuclear facilities to complement existing coal, oil, and gas plants, could be seen as a method for ensuring a nation's energy security). "Energy defense" are the measures a country might take to defend its energy interests (e.g. a military intervention in a major energy trading partner). "Regional developments" are defined as any major shifts in the economic and geopolitical landscape of areas within or nearby Arab League members (e.g. for some members, Pakistan-India dynamics will be of concern, while not so for others).

B. History of the Topic in the Arab World

The Arab World, particularly the Gulf States, have long been well known in the energy sector. Oil was first produced in the region in Iran in 1911, with deposits later discovered in Iraq, Bahrain (1932), and Eastern Saudi Arabia (1938) [5]. In order to attain more control over the oil industry, in 1960 three Arab countries (Saudi Arabia, Iraq, and Kuwait) became founding members of the Organization of Petroleum Countries (OPEC), and by the 1970s, most of the oil industry in the Gulf had been nationalized [6]. In 1973 OPEC orchestrated an embargo, leveraging its power to increase oil prices, creating drastic geopolitical disturbances and highlighting the world's dependence on the Middle East for energy [7].

Events in the past several years have had significant reverberations in the Arab World's energy landscape. On August 15, 2012 a cyber attack was launched against Saudi Arabia's national oil company Aramco [8]. It is widely held that Iran, Saudi Arabia's major regional rival and energy competitor, was behind the attack [8]. Meanwhile, instability driven by militia infighting and ISIS attacks jeopardizes Libya's significant oil-producing infrastructure [9]. In Iraq [10] and Syria [11], ISIS's advances have recently seen the loss of government-controlled oil and gas fields and hydroelectric dams. A major international intervention, spearheaded by the US and GCC, has sought to halt ISIS, and has destroyed several refineries to prevent the organization from using oil revenues to finance itself [11].

Given the Arab world's dependence on oil and natural gas for energy needs, nuclear energy is perceived as an effective supplement in energy diversification programs. It is widely held that

fossil fuel reserves are not sustainable in the long run, given diminishing reserves from growing international and domestic use. As such Algeria, Turkey, Jordan, the UAE, and Egypt are in the process of building reactors [1]. This is taking place despite the fact that in these countries energy is currently far cheaper to be produced from hydrocarbons rather than by nuclear reactor [1]. The Middle East has also been increasingly viewed as optimal for solar farms, with vast areas of unused desert land and a location between the energy-consuming powerhouses of Europe and East Asia [2].

C. Finding a Solution to the Problem: Past, Present, and Future

With the development of nuclear energy accelerating in the Middle East, the Arab League might find a role advocating for cooperative security measures that do not encroach on the sovereign rights of nations to develop their energy capacities. Cooperation amongst Arab states to develop a peaceful nuclear energy program is something to be considered, as well.

When formulating energy policies, delegates should look not just at current conditions, but also at general trends and their long-term implications. There are many dynamics to the energy picture in the region, such as ‘clean’ energy like solar [1]. Further, certain processes may be best suited to specific energy sources, with, for example, co-generation of both nuclear and solar power optimal for desalinization in Saudi Arabia [3]. Nevertheless, delegates should be mindful to keep the focus of the discussion on nuclear energy developments, how they may affect the region, and what the League can do to create favorable outcomes for its members.

When developing policies or initiatives, it is important to consider the region’s various geopolitical dynamics. Delegates should take into account the policies, aspirations, and capabilities of regional rivals, such as Iran, which may or may not be developing nuclear weapons. Regarding the monitoring of nuclear programs, the international community may insist on its bodies (such as the UN and the IAEA) performing checks – the Arab League may have a place in this process, and should perhaps consider working with such organizations.

Delegates should acquire a basic understanding of the technology around nuclear energy, the broad energy and geopolitical situation in the Middle East and how nuclear energy and weapons would fit into it. It is important also to explore how various international interests and relationships might affect the interests and strategies of the delegates’ nations.

I. Questions to Consider in Your Research

- What is the status of nuclear energy in my state?
- What are my state’s current energy policies and long-term goals?
- What measures have been taken in other countries to ensure nuclear safety?
- What would be the implications of more nuclear technology in the region? Economic? Security and defense? Political?
- What are the environmental implications of nuclear power, as well as its various alternatives?
- What is my state’s geopolitical standing (rivals, allies, and military capacity) and how do developments in nuclear capabilities affect this?

II. Questions a Resolution Might Answer

- What defensive measures might a nation take to safeguard against a rival nuclear power?
- How might a peaceful nuclear power program be harnessed for military use?
- How can the peacefulness of a nuclear power program be ensured?

- How do alternative energy sources compare with nuclear in terms of viability and safety?
- How should the League approach Iran's nuclear program and negotiations? How should the League approach the nuclear programs of its member states?

III. Resources to Review

An overview of energy threats in the Middle East:

<http://www.skollglobalthreats.org/global-threats/middle-east-conflict/>

Growth of nuclear energy:

<http://www.world-nuclear.org/info/Country-Profiles/Others/Emerging-Nuclear-Energy-Countries/>

Overview of nuclear power in the Middle East:

http://legacy.armscontrol.org/act/2008_05/MiddleEastEnergy

The future of GCC energy consumption:

http://www2.deloitte.com/content/dam/Deloitte/xs/Documents/energy-resources/meerwhitepaperseries/me_er_whitepaper4_energy_efficiency.pdf

Safety and environmental concerns of nuclear energy and weapons:

<http://www.nrdc.org/nuclear/>

Safety of nuclear power plants:

<http://www.world-nuclear.org/info/Safety-and-Security/Safety-of-Plants/Safety-of-Nuclear-Power-Reactors/>

Energy consumption data:

<http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=44&pid=44&aid=2>

Technical details of the Fukushima accident:

<http://www.world-nuclear.org/info/Safety-and-Security/Safety-of-Plants/Fukushima-Accident/>

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3. Conca, James. "Saudi Arabia Fast-Tracks Nuclear Power". Forbes. 9 August 2014. <http://www.forbes.com/sites/jamesconca/2014/09/08/saudi-arabia-fast-tracks-nuclear-power/>
4. <http://www.world-nuclear.org/info/Safety-and-Security/Safety-of-Plants/Fukushima-Accident/>
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- <https://history.state.gov/milestones/1969-1976/oil-embargo>
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 11. Mills, Robin. "ISIL is dismantling Syria's economy, oilfield by oilfield". 31 May, 2015. The National. <http://www.thenational.ae/business/energy/isil-is-dismantling-syrias-economy-oilfield-by-oilfield>

Topic 2: Coordinating the regional energy market to promote efficiency, maximize trade benefits, and boost Arab cooperation.

I. Introduction to the Topic

A. General Background

The Arab League contains many of the world's largest oil and natural gas producers, as well as potential for nuclear, wind, hydroelectric, and solar production. Much of this energy is exported abroad, to Europe, East Asia, and the Americas. However, the Arab League also contains countries with growing energy needs, and inadequate resources to meet them. A regional energy-sharing framework could help alleviate such disparities, boosting member state ties, cooperation, and development. Additionally, member states might capitalize on the comparative advantages afforded each nation to coordinate industrial development to the benefit of all. Given that much of the region's oil is shipped abroad via tanker, such an agreement may help mitigate the environmental degradation associated with shipping. An agreement could also prove efficient at the economic level, given the costs of shipping and pipeline construction.

“Trade benefits” are defined as net benefits derived from trade, such as lower prices of energy, more efficient production of energy, or greater revenue from energy sales. A “Regional Electricity Market” (REM) is defined as a multinational integrated power system that allows the direct exchange of electricity between countries in a region. Renewable and alternative sources of electricity generation could be integrated into REMs, making their infrastructure a flexible and long-term investment. Regional (and trans-regional) oil and natural gas pipelines are also tied into energy trade, as these allow the exchange of these fossil fuels between nations.

B. History of the Topic in the Arab World

The Arab League has long sought to strengthen energy-related ties between members. In 1998, the League implemented the Greater Arab Free Trade Agreement (GAFTA), with the goal of eliminating barriers to trade by 2008 [1]. By 2005 most tariffs had been removed, and GAFTA currently has 17 members [1]. In 2003 the Arab League introduced the Arab Renewable Energy Framework (AREF) to coordinate and enhance renewable energy production in the League [2]. Recently, analysts have expressed concern that the GCC is on an unsustainable energy consumption trend, with too large a percentage going towards residential use (47%, as opposed to the global average of 25%) and not enough towards industrial [3].

In 2011, the GCC completed the GCC Interconnection Grid, a power grid that connects the power systems of all GCC members (Kuwait, Saudi Arabia, Bahrain, Qatar, the UAE, and Oman) [4]. This treaty allows greater energy efficiency within these nations as they do not necessarily need to focus on building their individual electricity generating capacities, and could serve as a model for future regional electricity integration [4]. Another similar treaty is found in the Arab Gas Pipeline (AGP), a 1200 km-long trans regional natural gas export pipeline stretching from Syria, to Lebanon, to Jordan, to Egypt (circumventing Israel) [5].

C. Finding a Solution to the Problem: Past, Present, and Future

Delegates should weigh concerns over seeing the Arab world develop against other interests, such as exporting energy to wealthier clients, maintaining ties with non-Arab League states, balancing their budgets, and their own geopolitical rivalries and commitments. An agreement could provide roadmaps for individual countries. To maximize efficiency and avoid duplication, delegates could

review past agreements such as GAFTA and AREF for their negatives and positives, maximizing their efforts to produce an attainable goal.

Delegates should also consider reforming their domestic energy markets, for example looking for ways to engage the private sector, restructuring energy ministries, and otherwise incentivizing the creation of new energy sources and the improvement of old ones. Delegates should examine their existing energy infrastructure and export-import situation, looking for ways to hand over energy production to reliable partners who might be able to produce energy more efficiently, and seeing how their energy infrastructure (power grids and oil and gas pipelines) might be improved and integrated into regional systems. Environmental considerations should be taken into account, weighing concerns over climate change and pollution with economic and efficiency goals.

I. Questions to Consider in Your Research

- Which nations have comparative advantages in which forms of energy production? (e.g. Algeria might be best suited for solar, Syria for hydro, or Qatar for gas)
- Which countries are producing what kind of energy, to whom, how much energy are they exporting, and by what means (e.g. pipeline or shipping)? What are the long-term economic, geopolitical, and environmental implications of all of this?
- What industries are located in member states? What are their energy needs?
- Which Arab countries would greater energy imports benefit the most, and does my nation have an interest in seeing them develop?

II. Questions a Resolution Might Answer

- How can energy be most efficiently traded in the region?
- How will the costs of building the necessary infrastructure be met?
- How will an energy-sharing agreement benefit Arab League members, the environment, and regional cooperation?
- How can the League coordinate energy between members to maximize regional industrial output?
- How might the provisions of this agreement engage the private sector?

III. Resources to Review

Proposal for an Arab League common market and customs union:

<https://www.middleeastmonitor.com/news/middle-east/15443-arab-league-common-market-in-6-years-customs-union-next-year>

Pan-Arab renewable energy strategy for 2030:

http://www.rcreee.org/sites/default/files/irena_pan-arab_strategy_june_2014.pdf

Integrating electricity networks in the Arab world:

<https://openknowledge.worldbank.org/handle/10986/19329>

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2. Regional Center for Renewable Energy and Energy Efficiency. "Pan-Arab Renewable Energy Strategy 2030". International Renewable Energy Agency. 2014. http://www.rcreee.org/sites/default/files/irena_pan-arab_strategy_june_2014.pdf

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Topic 3: Exploring new energy technologies such as biotechnology to strengthen the energy market for both Arab suppliers and consumers.

I. Introduction to the Topic

A. General Background

Energy diversification has recently been a major focus of the largely hydrocarbon-dependent Arab states. Such diversification provides economic robustness, which endows geopolitical security, spurs foreign investment, and boosts employment. Meanwhile, new energy technologies have been advancing rapidly. Most of this activity has taken place outside the Arab region, though national companies such as Saudi Aramco are becoming increasingly involved in exploring renewables and other alternatives [3].

“New energy technologies” are any non-traditional methods of producing energy, such as renewables – a source that cannot be depleted by use (hydro, solar, geothermal) – or biotechnology, using biological resources (ex. ethanol from corn). “Suppliers” are defined as energy companies or economies dependent on energy production, and would benefit from new technologies as they could give them an advantage over competitors, allowing them to produce energy in a cheaper or cleaner manner. It also lessens their dependency on hydrocarbons, which could be effected by global energy market shifts, if, for example, a new vast reserve is discovered somewhere outside the Arab world. “Consumers” are any energy users that would benefit from new technologies that broaden their range of energy options and potentially lower their expenses.

B. History of the Topic in the Arab World

In 2003 the Arab League introduced the Arab Renewable Energy Framework (AREF) [1]. Its Pan-Arab Renewable Energy Strategy 2030 published in 2013 determined that by 2030, 2.3-9.4% of the region’s total energy generation would consist of renewable sources [1]. Recently, the smaller and wealthier GCC countries have sought to carve out niches as centers of cutting edge research on energy technology [2]. For example, Abu Dhabi’s Algae Research Laboratory and Microbial Environmental and Chemical Engineering Laboratory (MECEL), based at the Masdar Institute of Science and Technology (the “world’s first carbon-neutral city”), specializes in developing algae-based fuel [2]. Recent advances in general energy technology have included advances in wind turbine efficiency [4], advances in solar cell capacity [5], and advances in battery capacity [6].

Implementing or investing in new energy technologies may be expensive for a country. Indeed, at the moment hydrocarbon energy is cheaper than alternative sources [7]. Also, given the volatile nature and rapid evolution of the energy market, such investments may be risky. The large hydrocarbon endowments of many Arab nations may make investments in hydrocarbon technology far more worthwhile in the short term.

C. Finding a Solution to the Problem: Past, Present, and Future

Delegates should consider their specific economic situations, priorities, and long term prospects when weighing the degree to which they are willing to invest in energy technologies, and the extent to which they can provide aid towards other members. They should look at which technologies are most viable for strengthening the energy market, and which would be best suited for the Arab world’s unique geographic and environmental circumstances. They should also determine whether their country has the necessary human resources for engaging the alternative

energy market – perhaps partnerships with non-Arab League countries would be better suited for certain areas (e.g. Japan may have cutting edge battery technology that Arab countries could not rival).

Delegates should differentiate between what suppliers and consumers may want out of the process. They should also weigh the input and concerns of the various interest groups within their countries. The agreement could provide targets and roadmaps for individual countries, for example. Existing Arab League projects such as the Arab Renewable Energy Framework (AREF) would be useful references for discussion, starting points for further cooperation agreements, or the subject of the Council's actions.

I. Questions to Consider in Your Research

- How does a given technology bolster my country's energy policy?
- How feasible is a given technology for my country?
- How expensive might it be to implement new technologies in my country and across the Arab League?
- How can states cooperate to utilize new energy technology within the League? Would my state be willing to play a role in this?

II. Questions a Resolution Might Answer

- Which technologies are the most viable in the long run, in what countries, and how do they address the Arab League's long-term goals?
- How can the exchange of new energy technologies be better facilitated within the League?
- How does the Arab World contribute towards climate change and how might it mitigate it?
- What role might the League take in promoting the creation or the implementation of existing alternative energy technologies?

III. Resources to Review

Prospects for biofuel:

<http://www.renewableenergyworld.com/articles/2015/03/bolstering-a-biofuels-market-in-the-middle-east.html>

Prospects for solar power:

https://www.google.com/url?sa=t&ret=j&q=&esrc=s&source=web&cd=3&cad=rja&uact=8&ved=0CC0QFjAC&url=http%3A%2F%2Fwww.mesia.com%2Fwp-content%2Fuploads%2FMesia-Rev3-5.pdf&ei=Q32BVbe9E7LdsASh67lg&usg=AFQjCNG0EUZ_L_M1wWASBWBSsEr5bRIHLw&sig2=8gz0I0oj2VOoqjcrS4fhFQ

Worldwide prospects for hydropower:

<http://www.hydroworld.com/articles/print/volume-19/issue-2/articles/hydro-development-policy/outlook-on-the-future-of-hydro-development.html>

Growth of nuclear energy:

<http://www.world-nuclear.org/info/Country-Profiles/Others/Emerging-Nuclear-Energy-Countries/>

Pan-Arab renewable energy strategy for 2030:

http://www.rcreee.org/sites/default/files/irena_pan-arab_strategy_june_2014.pdf

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<http://www.alternative-energy-news.info/efficiency-of-wind-turbine-blades/>
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<http://www.alternative-energy-news.info/best-use-of-polymer-solar-cells/>
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