Turkey between Environmental Protection and Energy Security: A Regional Perspective

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ABSTRACT

Today, states not only find it necessary to secure energy supplies but also to address environmental threats due to climate change, decrease in biological diversity, concerns over water resources, and increasing individual and industrial energy needs. In this framework, Turkey is also focusing on environment and energy policies in its relations with its neighbors. Droughts, decreases in water resources, transit passage of oil tankers through the Black Sea and the Turkish Straits and a decline in biodiversity force Turkey to emphasize the access and use of environmentally friendly energy. However, economic and geopolitical concerns are also playing a crucial role in agreements with the energy producing countries. This paper demonstrates the dichotomy between energy and environment policies in the Black Sea region and Turkey, with references to international and regional needs.

In the early 1900s, ecology began to be seen as an independent scientific area. However, it wasn't until the end of the 1940s that ecology was used in the analysis of energy use and distribution, ecosystems, the harmful effects of industrialization and urbanization, and the conservation of natural resources.[1] Human impact on the environment was the catalyst for environmental movements in the 1960s, followed by the identification of environmental depredation and the exhaustion of natural resources as the two important threats against national security in the 1970s.[2] Thus, environmental security was included in the agendas of states, international organizations, and national and international civil society organizations as a priority topic. Simultaneously, energy security, particularly the security of energy supplies, became a national security issue due to the oil crisis

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in 1973 in energy consuming countries. The 1973 oil embargo, imposed by oil producing Arab countries, panicked US and European consumers, which forced energy consumer countries to reconsider their energy policies and relations with the OPEC members and search for energy alternatives. As OPEC member states increased the price of oil, the life blood of developed industry, diversification of energy resources became vital. Therefore, since the 1970s it can be observed that easy access to energy resources, diversification of resources, and smooth transit passage of oil from energy producing countries to energy consumer countries became an important subject in security debates within the international system. In this context, the significance of transit countries and seas increased, since these have been the key geographical areas in this desired secure energy transition. However, as the oil and natural gas transit from the Middle Eastern, Mediterranean and Black Sea countries to western European countries amplified, environmental concerns and threats increased as well. In other words, states, international organizations, companies and individuals started to prioritize two controversial security issues – environmental and energy – at the same time. Although this debate was spread all over the world, this paper only focuses on the Black Sea region in general and Turkey in particular.

Research has shown that international attention given to the Mediterranean Sea has generated a more positive impact on environmental protection, as compared to that of the Black Sea.[3] Industrialization around the Black Sea during the Cold War, lack of international attention for long decades, and the region's position since the Second World War as a crucial hub for the transport of the energy produced by Caucasian and Black Sea littoral countries to the energy consuming countries in Europe aggravated the environmental situation in the region. Pollutants created by chemical industries and oil leaking from tankers have caused a decrease in biological diversity. Thus, increased pollution in the sea entered the agendas of governmental and non-governmental international/regional organizations and individual states in the last two decades. Unfortunately, after the end of the Cold War and collapse of the Soviet Union, the main priorities of the newly independent states included neither an increase of biological diversity nor a decrease in pollution. As the regional states put their efforts toward competing in the international liberal market, they focused on increasing industrialization, trade and economic ties with the energy demanding countries. With

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these aims, both energy demand and supply security became the top priorities of the region. Although international and regional agreements were discussed and signed, environmental issues were put on the sidelines.

In 1972, the United Nations (UN) Conference on the Human Environment, held in Stockholm, induced the Regional Seas Programme of 1974. The programme, which includes the Black and Mediterranean Seas, "aimed to address the accelerating degradation of the world's oceans and coastal areas through the sustainable management and use of the marine and coastal environment, by engaging neighboring countries in comprehensive and specific actions to protect their shared marine environment."[4] However, these programmes did not foresee any serious sanctions facing those states choosing not to comply; therefore, they were only based on voluntary compliance. Since energy and environmental issues are perceived as political matters, harmonization of energy and environmental policies and the application of these accepted rules and regulations become problematic. Worse still, as the political relations and conditions of the region change, these agreements are altered.[5] In this framework, this paper analyses the dichotomy between energy and environment policies in the Black Sea region and Turkey with references to the international response.

The Case of the Black Sea Region in General

Since the Chernobyl disaster in the Black Sea region, it has been understood that environmental problems are not restricted to the countries of their origin, and that such threats are as important as the conventional threats of the Cold War era. The Chernobyl nuclear reactor accident of 1986 forced Gorbachev to include ecological security in his Perestroika policies in 1987. After the collapse of the Soviet Union, economic stabilization, development, energy security and trade stood out in the regional debates. In the same way, the international community focused on environmental security more in the 1990s, which forced the countries around the Black Sea to discuss energy security, economic development, and environmental issues together. Therefore, a vibrant relationship between energy and environment policies became indispensable for the Black Sea region as a whole. Particularly after the adoption of the Convention on the Protection of the Black Sea against Pollution in 1992, it has been observed that the regional countries started to debate the need for economic development without degrading the environment by focusing on sustainable development. However, this relation proved to be problematic, since energy and the environment have been perceived as two conflicting policy areas. The desire of individual states to increase their economic benefits, especially by increasing energy based trade with energy consuming countries, alienated them from fully

understanding the principle of sustainable development. Also, their approach is to use the cheapest oil transfer route by tankers through the Sea, which has the potential to create catastrophic environmental situations due to leaks.

The Black Sea countries, as a result of their development needs, seek to expand their economic activities while focusing on industrialization and increasing their production capacities. These intentions often result in little or no consideration for environmental protection and sustainable development. Industrial activity in Russia, Ukraine, and Belarus causes air pollution due to the proliferation of nuclear industrial power plants. Also, in these countries pollution in the soil prevents productive agricultural activities. Laurance Mee, after conducting ecological research in the Black Sea, defined the region as an environmental catastrophe.[6] Eutrophication/nutrient enrichment, chemical pollution (including oil), changes in marine living resources, overfishing, biodiversity decline and climate change negatively affect living standards of the people in the region. Unfortunately, individual states continue with their industrialization projects, disregarding the significance of sustainable development.

Every energy generation activity has an impact on the environment. Renewable energy resources are accepted as the best remedies in environmental protection

At the international level, since the 1990s, smaller regional and bigger international organizations have started to implement projects in order to emphasize the importance of environmental threats and also to counteract the environmental damage perpetrated by the industrial and energy sectors. There have been several European Union (EU) [(PHARE, Black Sea SCENE, Black Sea Global Ocean Observing System (Black Sea GOOS), SESAME, PLANCOAST, TACIS /EUROAID and so on)] and UN [(GEF/UNDP Black Sea Environmental Program)] funded projects and programmes aiming to increase awareness and help to create new control mechanisms with different particular priorities. These attempts had small positive impacts on increasing biological diversity and decreasing environmental pollution in the Black Sea region.

Cooperation has increased since the end of the Cold War, and the Black Sea shows small signs of recovery. However, more needs to be done regarding the assessment of basic environmental threats, the state of the environment and price of inactivity, development of an environmental policy, adoption of legal documents and ratification, and the implementation and enforcement of those legal documents. It has been argued that there is an urgent need to deal with energy security, economic development and environmental matters concurrently, both at the international/regional and national levels.[7]

A marked increase in the demand for energy resources is now observed. Developed countries need 75 percent of the energy supply[8] due to increased industrialization, changes in lifestyles, and increased migration from rural to urban areas. It is projected that until 2030, yearly energy needs will increase 1.8 percent, [9] and that natural gas needs will increase 2.3 percent in developed countries. Also, the demand for natural gas for industrial use will increase up to 47 percent by the same year.[10] The International Energy Agency (IEA) predicts that the increase in energy needs will reach the level of 60 percent of today's levels, and it is foreseen that this kind of increase in energy demand may not be met by the energy producing countries only.[11] With renewable energy use at only 14 percent,[12] there seems to be an urgent need for better utilization of these alternative and clean types of energy resources. The studies demonstrate that decentralization of the production of biomass, sun, wind and geothermal energy,[13] and the construction of infrastructure for the distribution of these types of environmentally friendly energy resources are necessary. Unfortunately, concerns over economic development, close relations between the oil and gas companies and the states, rivalry among regional states, the lack of international and national desire to construct renewable energy plants and infrastructure for distribution of this type of energy prevent international and regional organizations taking steps in this direction.

Although it is an agreed upon fact that close cooperation between economically developed and less developed countries is necessary (i.e., UN Millennium Declaration), political conflicts (hot and cold) hamper cooperation at both regional and international levels. The lack of cooperation and agreement among the regional states, the increasing number of tankers passing through the Black Sea, rivalry regarding oil and natural gas pipelines and the decreasing effectiveness of the pipeline projects result in the continuation of environmental threats for the sea in general and the Bosphorus and Dardanelles in particular.

As the oil and natural gas transit from the Middle Eastern, Mediterranean and Black Sea countries to western European countries amplified, environmental concerns and threats increased

The research has also shown that biological diversity, not only in the Black Sea but also in the Bosphorus and Dardanelles, has decreased considerably.[14] The environmental degradation and decrease of biodiversity in the sea also negatively affect biodiversity on land; i.e., migration routes of the birds in the region have changed, and the diversity of sea birds passing through the region has decreased.[15] Although international and regional organizations try to focus on these threats and increase awareness for environmental issues, political conflicts

prevent regional states acting together, and complicate the possible cooperation efforts.[16]

The Black Sea is an isolated sea. Therefore, chemical pollution, oil leakage and decreases in biological diversity are observed more in the region than the Mediterranean and the Aegean seas, thus hampering tourism activities in the Black Sea basin.[17] Despite tourism's potential role in increasing political, social and economic relations among the states and the people around the Black Sea, competition in the energy field has combined with political conflicts, resulting in a renewed lack of trust and decreased significance given to environmental policies and the related tourism activities in the Black Sea riparian states.

There is an urgent need to deal with energy security, economic development and environmental matters concurrently, both at the international/regional and national levels

At the international level, governmental and nongovernmental organizations pay particular attention to the control mechanisms for tanker traffic and the renovation of tankers and harbors (i.e., International Marine Organization, Helsinki and Bucharest Agreements, UN Law on the Sea, and so on). However, these efforts could not fully prevent leaking tankers passing through the sea, since the agreements at the international level could not trigger the amendments in the national Law of the Sea of regional states and compel the states to vigorously implement international law.[18] Again, rivalry in industrialization and economic development among the regional states is observed as the main reasons for ecological problems.[19]

Today, all the research and studies demonstrate a need for the construction of alternative energy transit routes and new diverse energy resources in the wider Black Sea region.[20] The researchers and representatives of the regional states and organizations agree that a balanced regional development in line with the international agreements is necessary for sustainable development for all the states around this particular sea basin. However, in the field research conducted in Turkey, Greece, Bulgaria, Moldova, Ukraine, Georgia, and Armenia, researchers, practitioners, and politicians stated that the environment cannot be separated from geopolitics and geopolitical issues (i.e., instability, cooperation and economic development).[21] Experts have identified especially Nagorno-Karabakh (between Armenia and Azerbaijan), Abkhazia, and South Ossetia (among the South Caucasus countries) as the main problem areas in the region, and stated that it is wishful thinking to believe in environmental cooperation at the international and/or regional level unless political solutions are obtained for these conflictual situations.[22] In this framework, instability, imbalance and

conflicts among the states negatively affect the cooperation, trade and security in the region, while lack of trust among the states prevents almost all types of economic, social, and political cooperation, including cooperation necessary for the construction and handling of pipelines.

Case of Turkey

As one of the largest countries in the region, Turkey has a big potential role to play in environment and energy related policies and cooperation efforts. After the collapse of the Soviet Union, Turkey initiated some regional cooperation mechanisms and actively participated in others. However, like the newly independent countries, Turkey concentrated on economic development and energy policies, and became a part of regional conflicts. Environmental concerns were shunted aside, although Turkey is one of the main victims of environmental degradation in the region. The negative effects of pollution and decrease of biological diversity in the Black Sea affected Turkey economically and socially. More importantly, tanker traffic in the Bosporus and the Dardanelles, which reached 2.9 million barrels a day in 2009,[23] creates a high risk for Istanbul and the other industrial cities in the region. In this framework, Turkey started to search for alternative ways to transfer oil and natural gas from the energy producing regional countries to (mainly) (Mediterranean) Europe, since the increase in energy imports to the EU countries opened a new and profitable opportunity for Turkey to boost its economic development. Turkey, situated right in the middle of energy producing and consuming countries, perceived this geopolitical position as a window of opportunity and focused on reliable, diverse, and cost effective energy policies, while aiming to create a more liberal energy market.

Turkish energy policy focuses on the importance of a) meeting energy demands; b) implementing measures for preventing waste; and c) protecting the environment and public health.[24] In the beginning of the 2000s, the Energy Efficiency Notice (2000), and the Electricity Market Act (2001) were followed by the Energy Efficiency Law (2004), to reduce costs, emissions, and other environmental impacts; increase renewable resources; increase investments in energy supply and improve competitiveness and productivity.[25] According to the OECD data, Turkey is one of the countries characterized by the highest increase in energy demand and concerns over security of supply.[26] It wants to benefit from all the natural gas and oil resources of its neighbors and, therefore, to implement a strategic energy policy in its region.[27] Population increase, rise in the economic needs, technological developments, and increasing energy demands in relation to these factors take up an important place in Turkey's economic, political and energy policies.[28] Since the 1990s, Turkey's energy production

increased by 4.3 percent, but this increase also brought an increase in carbon dioxide emissions. Research shows that Turkey's carbon dioxide emissions will increase 5.8 percent every year until 2025.[29] It is argued that although the legislation foresees measures to increase energy efficiency through institutional, administrative and market regulations, there is a need for more focus on renewable energy resources to decrease the dependency on imports.

The increase in energy production has not kept pace with the energy demands of Turkey's industry and people. Therefore, like the EU countries, Turkey is dependent on energy imports, mainly from its neighbors. In the 1970s, Turkey started to take steps for the construction of oil and natural gas pipelines and, since the 1990s, observers noted that the infrastructural investment for these pipeline projects has accelerated.[30] Projects such as Samsun-Ceyhan (petrol), Baku-Tbilisi-Erzurum (gas), Baku Tblisi Ceyhan (petrol), Trans Anatolia (gas) and NABUCCO (gas) aimed at increasing the volume of the energy carried, but also bypassing the Black Sea because of environmental concerns. South Stream (gas) project that Russia and Turkey agreed on in 2011 to be built under the Black Sea is perceived as an important step to increase the energy security in the region. However, although the regional countries are dependent on each other regarding energy supply-and-demand security, environmental concerns and economic relations, political disagreements, rivalries and conflicts still continue to negatively affect these projects (i.e., Bourgas-Alexandropolis pipeline, which was shelved in autumn 2011).[31]

> Cooperation among civil society organizations and municipalities between Greece and Turkey, Georgia and Armenia, and Romania and Turkey demonstrate that environmental cooperation and implementation of the agreements are possible

Regional countries, which are not able to overcome the conflictual relations, also do not pay the necessary attention to renewable energy resources. The increasing significance of natural gas and dependence of industrial production on natural gas has hindered the construction of renewable energy infrastructural projects that started in the beginning of the 1990s. [32]

Although international agreements deal with environmental protection, increasing biological diversity, and decreasing pollution (sea, air and soil), imbalances in the region regarding economic development, underdevelopment of good governance, political and military conflicts between the states and unconsolidated democracies in the region create important obstacles in the implementation of these international agreements.[33] However, cooperation among civil

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Today, all the research and studies demonstrate a need for the construction of alternative energy transit routes and new diverse energy resources in the wider Black Sea region.

society organizations and municipalities between Greece and Turkey, Georgia and Armenia, and Romania and Turkey demonstrate that environmental co-operation and implementation of the agreements are possible. Research has shown that as people living in the polluted areas realize the negative effects, people-to-people contacts trigger cooperation.[34] However, at the governmental levels, energy is perceived as a politically strategic area, which prevents the enhanced implementation and application of environmental agreements, rules and regulations.

Since the environment is perceived as closely linked to energy policies, governments view pipelines for oil as a means for decreasing tanker traffic in the Black Sea, Bosphorus and Dardanelles, and thus as a more environmentally friendly alternative. However, pipelines are as dangerous as the tankers for the people living along their routes. Protection of the pipelines is a vital topic, due to the political and military conflicts existing in the region. Pipelines are also very vulnerable to natural disasters such as earthquakes, floods and fire. Existing pipelines and those under construction (Blue Stream, White Stream, NABUCCO, BTC and Samsun–Ceyhan) are significant for both the EU and Turkey in terms of energy supply security. However, interruptions in these pipelines may create problems for electricity production in the EU countries. Especially after the 1990s, natural gas has been used for electricity production[35] and in recent

years, interruptions of natural gas transfer, particularly from Russia to Ukraine, demonstrated that natural gas is not a sustainable energy type either.

Another alternative that has been debated is nuclear energy. Increasing population, developing economies, and increasing energy needs push countries to find cost effective energy resources. In this framework, like other developing countries, Turkey started to consider nuclear energy power plants again with an aim to save itself from dependency on energy producing countries.[36] Nuclear power plants to be constructed in Sinop and Mersin have been discussed for a very long time in the country; however, licensing problems in Sinop left Mersin-Akkuyu as the only alternative for a nuclear power plant. It is estimated that this power plant will produce 5000 megawatts in energy and the investment will cost around 20 billion US Dollars, to be realized jointly with Russia.[37] This project, while creating an important energy resource for Turkey, will also increase the economic and trade relations between Turkey and Russia.[38] Nevertheless, nuclear power plants also create threats for the people and the region – some similar to the threats presented by pipelines, others unique to nuclear energy. After the earthquake in Japan in March 2011, nuclear threat has been the number one topic in energy debates, forcing EU member states to revise their nuclear energy policies. In this context, the opposition's hand against nuclear power plants became more powerful. The debates focused on using renewable energy resources rather than nuclear energy, since accidents (i.e., Chernobyl) and natural disasters (i.e., Japan) endanger the lives of the people due to radioactivity. In this framework, the status of the nuclear power plant at Kozloduy in Bulgaria has been revisited, as debated during the EU-Bulgaria negotiations. It was agreed that 4 of its units would be closed down in 2009, but as this process was not finalized, Bulgaria was given a longer period of time, until the end of 2013. However, Bulgaria continues with its Belene nuclear power plant plans. Another controversial nuclear plant has been Metsomar power station in Armenia, perceived as one of the most dangerous due to the lack of primary containment structures. But again, the International Atomic Energy Agency (IAEA) and Armenian authorities dismissed the possibility of a failure in these plants.[39] Therefore, the regional states' changing agendas, relations and priorities prevent predicting the future of nuclear energy plants at the moment.[40]

Renewable Energy Resources

Every energy generation activity has an impact on the environment. Renewable energy resources are accepted as the best remedies in environmental protection. Although there are some environmental issues regarding wind turbines (land-use conflicts, clearing trees in some areas, noise and wildlife concerns),

solar power systems (fossil fuels used to manufacture and install solar components generate emissions) and geothermal energy (land subsidence, safe disposal of hazardous waste), their environmental impact can be reduced to acceptable levels.[41] Water, sun, and wind are seen as the main energy resources to fight against environmental threats when used with modern technology. However, we need to be careful with these energy resources as well – especially water, since hydroelectric power plants have effects on natural and social environments. For that reason, there is a need for vigilant calculations in the construction of these plants.[42] On the other hand, solar and wind power are especially favorable for countries of the Mediterranean and Black Sea region, including Turkey.

After the 1990s, the emphasis on renewable energy resources in Turkey increased, but the number of investors in this sector was limited although an increase after 2001 has been observed. The new Renewable Energy Law of 2010 and amendments brought to it in 2011 are expected to increase both the number of investors and the volume of investment.[43] In Turkey, the research has demonstrated that there is a need for investment not only in the construction of renewable energy power plants, but also in the transmission of wind and solar energy. As long as the full-scale integration of the energy produced by wind turbines and solar panels is not realized, the demand for these energy resources will be kept at minimum levels. The same applies to the geothermal water resources in Turkey. Some villages, districts of big cities in the Aegean region and some smaller villages in central Anatolia use geothermal resources, especially for heating purposes. However, the lack of investment and infrastructure for this type of energy limits its broader utilization. In Turkey, although research conducted since 1962 demonstrates that there may be about 550 MWe of geothermal energy usable for electrical power generation,[44] new infrastructural investments are needed for this volume of energy to be used on a larger civilian scale.

According to the OECD data, Turkey is one of the countries characterized by the highest increase in energy demand and concerns over security of supply

Hydroelectric power is an important energy resource for Turkey, and the Southeast Anatolian Project (SAP), with 22 damns and 19 hydroelectric power plants, is the biggest power plant project in the region. Social, economic, and natural effects on the environment need to be studied carefully and new investments should be encouraged in line with the results of these investments. It is certainly believed that hydroelectric energy, together with geothermal water resources and solar power, would be an important investment for the country. Similar to the water (including geothermal) resources, sunshine is abundant in

Turkey, due to the country's climate. In the year 2000, solar energy for domestic water heating was equivalent to 262.000 TOE (ton of oil equivalent) per year, which was increased to 420.000 TOE in 2007 and 429.000 TOE in 2009.[45] The average sunshine is 2.640 hours per annum, and solar intensity is 3.6 kWh/m^2-day in Turkey.[46] Solar energy has a technical potential of 8.8 MTOE electricity generation and 26.4 MTOE heating capacity.[47] Solar hot water collectors are commonly used in the Aegean and the Mediterranean regions; 12 million m^2 flat plate solar thermal collectors were in use in 2009 in Turkey.[48] The Aegean and the Mediterranean regions are also suitable for using wind power to generate energy. Energy generated from wind power is one of the fastest growing energy sources globally and Turkey's first wind farm was commissioned in 1998, having a capacity of 1.5 MW.[49] RNCOS's latest research has shown that Turkey's wind energy potential is 83000 MW, but by the end of 2011, Turkey's installed wind energy capacity is only around 1600MW.[50]

South Stream project that Russia and Turkey agreed on in 2011 to be built under the Black Sea is perceived as an important step to increase the energy security in the region

Obviously, Turkey is using a very limited percent of its sun, wind and geothermal energy potential. Although the 4628 Electricity Market Law allows investors to realize energy generating projects valuing up to 10,000 MW,[51] the lack of infrastructure for the distribution of the energy produced limits the utilization of environmentally friendly renewable energy sources. In the literature it has been argued that although Turkey has a strong energy demand,[52] the upfront capital cost of renewables[53]and the lack of budgets for R&D projects, cooperation and coordination between institutions, databanks, and policies to encourage the private sector in order to increase competition are the main obstacles hindering the investment in the country.[54] Also, natural gas, oil, and nuclear energy resources are seen as foreign policy tools in the hands of the states, both globally and regionally. States try to achieve reliable independent energy resources while increasing their competitiveness, but their ability to access and demonstrate some control over traditional energy resources is required for the continued development of national power.[55] This dichotomy is keenly observed in the Black Sea region.

Energy also determines – and sometimes balances -- the relations among the states through shared energy projects (i.e., Russia and the Commonwealth of Independent States (CIS), Azerbaijan, and Turkey). The industrialized EU, as one of the main energy markets for the regional countries, reinforces this system by basing its initiatives in the Black Sea and Caspian regions on a tradeoff:

"European funding and investment for infrastructure development in return for a guarantee of supplies to European [energy] markets."[56] As energy consumption is vital for industrialized economies, both economic and political barriers were high in developing international agreements on the environment.[57] But in return, this importance given by the industrialized countries to energy and their dependence on oil and natural gas have created a favorable political setting for less developed energy producing countries to use energy as a leverage tool in their foreign policies.

Conclusion

Environmental policies in the Black Sea have come a long way since Gorbachev, including ecological security in his Perestroika policies. At the international and regional levels there have been a number of policies adopted in the last three decades with an aim to prevent degradation of the environment while boosting economic development. However, it has been observed that although the environment has been one of the main issues of debate in the international arena, energy demand, and the security of energy supplies have overshadowed environmental protection. Especially after the late 1980s and the beginning of the 1990s, the need for energy in energy consuming countries increased due to increased industrialization. As states and people put their efforts into reaching the most convenient and cheapest energy resources, environmental concerns were pushed aside. The recent natural disasters, increased threats to human security, and concerns over the sustainability of the energy sources combined with environment debates have sparked discussions on sustainable development, both in economic terms and those regarding energy policies. The research conducted in the region demonstrates that there is a need for more production of biomass, sun, wind, and geothermal energy and construction of infrastructure for integrating these energy sources to the electricity grid of these types of energy. However, political conflicts, economic rivalry, and the lack of cooperation and trust among the regional countries interfere with the steps that need to be taken to meet these needs.

Tanker traffic in the Bosporus and the Dardanelles, which reached 2.9 million barrels a day in 2009, creates a high risk for Istanbul and the other industrial cities in the region

After the Cold War, regional states including Turkey concentrated on economic growth and increasing energy supply due to the increased industrialization initiatives. Turkey, as many other regional countries, first focused on meeting energy needs and increasing trade, and then preventing waste and protecting the

environment. The studies conducted on Turkey's potential in renewable energy resources have demonstrated that Turkey is using a very limited percent of its sun, wind, and geothermal energy potential. It is also observed that natural gas, oil, and nuclear power are used as high politics tools among energy producing, transit and consumer countries. As the countries in the Black Sea region tried to compete in international liberal markets by increasing their ties with the energy consumer countries, Turkey -a natural transit passageway- focused on energy as a foreign policy tool. Also, Turkey, as one of the countries characterized by the highest increase in energy demand, aims to benefit from the natural gas and oil resources of its neighbors. In this framework, although renewable resources were included in Turkey's energy policies, the necessary investments have yet to materialize.

Endnotes

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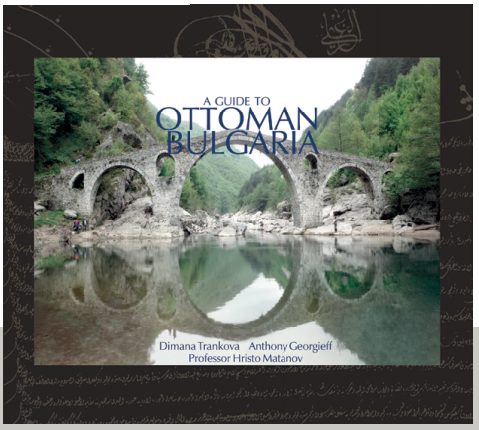

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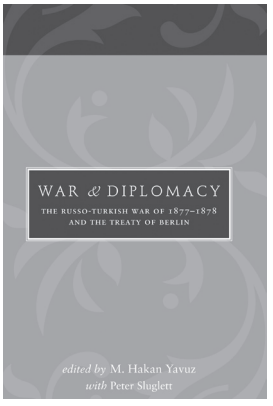

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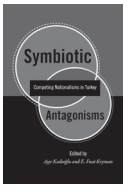

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