

BRIEFER

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Nuclear Energy Developments, Climate Change and Security in Turkey

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INTRODUCTION

In “The Clash of Civilizations,” Samuel Huntington categorized Turkey as a “torn” state between the West and Islam.¹ While this categorization is overly simplistic, it points to Turkey’s problematic identity that is reflected in its foreign and security policymaking between East and West. This complicated landscape is seen in Turkey’s quest to balance its security dynamics as it works to address energy challenges and climate change risks.

The state of affairs between Turkey and the West, the United States in particular, reflect a test of solidarity. There are increasing concerns over Turkey being an “unreliable” ally given the divergence of interests on a number of regional challenges in the Middle East. This is especially the case in Syria where Turkey argues that its allies are not sensitive to its national security concerns, leading to unilateral action and alternative alliances, such as a strategic partnership with Russia and a new nuclear energy program.

Turkey is also a non-nuclear member of a nuclear alliance in a region where nuclear proliferation is of particular concern. It is the only North Atlantic Treaty Organization (NATO) member that has a border with the Middle East. Despite the frequent nuclear “cascade” scenarios naming Turkey as a country that could pursue nuclear weapons in the region, nuclear weapons and their delivery systems do not have a defining role in Turkish security and defense strategies.

As a rule-abiding member of the global nonproliferation regime, Turkey is keen on pursuing civilian nuclear technology. Addressing the fast-growing demand for electricity and supporting economic development are key drivers of Turkey’s interest in pursuing a nuclear power program. Energy security and

¹* The views expressed are the author’s and do not necessarily reflect those of CRDF Global.
1 Samuel P. Huntington, “The Clash of Civilizations?” *Foreign Affairs*, Summer 1993, p. 42.

diversification is a vital component of Turkey's 2023 goals - 2023 being the centennial of the establishment of the modern Republic of Turkey in 1923 by Mustafa Kemal Atatürk.

Turkey's previously failed attempts to access civilian nuclear technology has led to an intergovernmental approach with Russia to construct the Akkuyu Nuclear Power Plant (NPP) near Mersin along the Mediterranean Sea. The "build-own-operate" (BOO) model offered by the Russian Federation is advantageous for a nuclear newcomer such as Turkey as it alleviates financial risks, minimizes delays, and brings operational know-how.

This brief provides an overview of Turkey's energy needs and nuclear energy plans and an analysis of these plans in context of climate change, nuclear security and broader security trends in Turkey and its region, with a particular emphasis on the safety and security implications of the BOO model.

TURKEY'S ENERGY NEEDS AND NUCLEAR PLANS

Turkey has had a reiterative quest for nuclear power, repeatedly failing to conclude tenders, leading to the current intergovernmental agreement (IGA) approach; in which Turkey would sign agreements with foreign governments to cooperate in the field of nuclear energy. For decades, Turkey had "plans but no plants" to benefit from civilian nuclear energy.² Political and economic instability, as well as Turkey's insistence on a financial model that assigned all risks to the suppliers contributed to the failure of these ambitions to be effectively implemented.

While the Akkuyu Nuclear Power Plant became known under the Turkish-Russian partnership, it had in fact been first licensed in 1976 and negotiated with the Swedish ASEA-ATOM and STAL-LAVAL on a reactor supply as a result of its first nuclear tender.³ These financial negotiations collapsed in the aftermath of the 1980 military coup. The process of failed tenders was repeated in the 1980s, 1990s, and 2000s, until in 2008 when Turkey sought bilateral agreements with Japan and Russia.

The peaceful use of nuclear energy is a national strategy for Turkey to diversify its primary sources of energy, to decrease its vulnerability and dependency on foreign sources of oil and natural gas, and to support other sources of energy, such as water, coal, geothermal, wind, and solar. According to the International Energy Agency (IEA), as a growing developing economy with a population of 81 million, Turkey's electricity consumption has grown by 436.72% from 1990 to 2018.⁴ The Turkish Ministry of Energy and Natural Resources estimates that Turkey has the fastest growing electricity demand among OECD members by a 7% per year on average, reaching 500 TWh/yr in 2023.⁵ According to Eurostat, Turkey's reliance on energy imports in 2017 was 77.2%.⁶

Unplanned interruptions and shortages in supply, technical difficulties, or political conflicts and sanctions, especially in the case of Iran, make the Turkish economy vulnerable. The intergovernmental agreement approach enables low prices that Turkey would not be able to get by tenders, as governments consider other aspects of bilateral economic and political relations in building energy cooperation. This often leads to concessions from governments that are beneficial to Turkey.

² Mustafa Kibaroglu, Louise Shelley, and William C. Potter, "Correspondence," *Nonproliferation Review*, 17: 3, 2000, pp. 437- 440.

³ Mustafa Kibaroglu "Turkey's Quest for Peaceful Nuclear Power," *Nonproliferation Review*, Spring-Summer 1997, p. 36.

⁴ International Energy Agency, "Turkey," at: <https://www.iea.org/countries/turkey>

⁵ "Turkey's Energy Profile and Strategy," Republic of Turkey, Ministry of Foreign Affairs, at: <http://www.mfa.gov.tr/turkeys-energy-strategy.en.mfa>

⁶ "Turkiye 39 Avrupa Ulkesi icinde Enerjide Ithalata En Fazla Bagimli Besinci Ulke," *Euronews*, August 29, 2019, at: <https://tr.euronews.com/2019/08/29/turkiye-39-avrupa-ulkesi-icinde-enerjide-ithalata-en-fazla-bagimli-besinci-ulke>

With these objectives in mind, on May 12, 2010, Turkey signed an IGA with the Russian Federation for the construction of four Generation III plus VVER-1200 nuclear power reactors by a consortium led by Rosatom. Rosatom State Atomic Energy Corporation is the Russian Federation's national nuclear corporation organization, and the Joint Stock Company (JSC) Atomstroyexport (ASE) is the Russian Federation's nuclear power equipment and service export monopoly. Rosatom established the Akkuyu Nuclear Power Plant (NPP) Electricity Generation JSC company in Turkey on December 13, 2010, based on the initial condition that Rosatom's share would not be less than 51 percent.⁷

While the 2010 intergovernmental agreement originally envisioned a ten-year construction period, Akkuyu Nuclear Power Plant has been subject to technical, bureaucratic, financial, and political delays. The first milestone that was delayed resulted from one of the key environmental reports, as the environmental impact assessment submitted by Rosatom in June 2013 did not meet the Turkish Energy Ministry's safety criteria and was resubmitted in 2014 due to "deficient information."⁸

The Akkuyu project suffered from another major delay in November 2015, when Turkish forces downed a Russian Su-24 bomber along the Syrian-Turkish border. Putin labelled the act a "stab in the back" and put a halt on joint projects, including construction at the Akkuyu site. In April 2016, Rosatom announced that they were looking to sell 49% of the Akkuyu Nuclear Power Plant stakes given financial difficulties surrounding the project.⁹ While there have been reports in Turkish media regarding possible buyers such as the Turkish-owned Cengiz-Kolin-Kalyon consortium, based on a February 2018 report, they have officially withdrawn from negotiations.¹⁰

Despite these financial uncertainties, in April 2018, Presidents Putin and Erdogan launched the groundbreaking ceremony for Akkuyu Nuclear Power Plant via videoconference.¹¹ Throughout 2019, Rosatom received the construction licenses for the first two units, as well as the December 2019 agreement for the connection to the Turkish electricity grid. As of February 2020, both Turkish government officials and Rosatom representatives report that the first unit at Akkuyu will be operational by 2023, and the second unit to be operational by 2026, 7 years after the construction license.¹² The megaproject is put forward as an employment opportunity for the Turkish energy sector within its planned 60-year lifetime.

Akkuyu is only one of the three planned sites for Turkey's nuclear energy program, but it is the most advanced project in terms of its development. In May 2013, Turkey and Japan signed a joint declaration on cooperation in peaceful nuclear energy, nuclear power plants, and nuclear power industry.¹³ For several years, a Franco-Japanese joint venture by Japan's Mitsubishi Heavy Industries Ltd and Itochu Corporation, and France's GDF Suez, considered signing a deal for four 1,200 MWe ATMEA1 pressurized water

⁷ Salih Sari, "Current Nuclear Power Situation in Turkey," IAEA Technical Meeting on CNPP, Vienna, Austria, March 18-21, 2013.

⁸ "Akkuyu EIA report turned down by Environment Ministry," *Sunday's Zaman*, July 28, 2012, at: <http://www.todayszaman.com/news-322112-akkuyu-eia-report-turned-down-by-environment-ministry.html>

⁹ "Ruslar Akkuyu Nukleer'in hisselerini satiyor," *BBC Turkce*, April 27, 2016, at: https://www.bbc.com/turkce/ekonomi/2016/04/160427_akkuyu_hisseler

¹⁰ "Cengiz-Kolin-Kalyon (CKK) konsorsiyumu Akkuyu'dan cekildi," *Haberturk*, February 6, 2018, at: <https://www.haberturk.com/cengiz-kolin-kalyon-ckk-konsorsiyumu-akkuyu-dan-cekildi-1826199-ekonomi>

¹¹ "Akkuyu Nukleer Santrali'nin temeli atildi," *Anatolian News Agency*, April 3, 2018, at: <https://www.aa.com.tr/tr/gunun-basliklari/akkuyu-nukleer-santralinin-temeli-atildi/1107089>

¹² "Akkuyu Nukleer Santrali'nin ilk Unitesi 2023'te Hizmet Girecek," *Hurriyet*, February 5, 2020, at: <https://www.hurriyet.com.tr/ekonomi/akkuyu-nukleer-santralinin-ilk-unitesi-2023te-hizmete-girecek-41439901>

¹³ *Joint Declaration by the Government of Japan and the Government of the Republic of Turkey on Cooperation in the Field of Nuclear Energy and Science and Technology*, Ministry of Foreign Affairs of Japan, May 3, 2013, at: <http://www.mofa.go.jp/mofaj/files/000018378.pdf>

reactors in the Black Sea city of Sinop. However, in 2018, Japan withdrew from the project, citing doubled investment costs due to post-Fukushima safety measures.¹⁴

While not finalized, Turkish officials have referenced site investigations for a third nuclear power plant in the northwest of Turkey - in the Black Sea town of Igneada - possible Chinese investment.¹⁵

CIVILIAN NUCLEAR ENERGY PLANS IN CONTEXT: CLIMATE, SECURITY AND REGIONAL TRENDS

Turkey is adamant about its right to pursue peaceful nuclear energy. However, there are various measures Turkey has taken with respect to reassuring the international community of the peaceful nature of the prospective nuclear energy program. While these measures have fulfilled nonproliferation regime participation, as a newcomer Turkey's decision makers are faced with questions on the safety and security of these nuclear plans within the regional security context.

On the domestic institutional front, in 2006, then Director General of the International Atomic Energy Agency (IAEA) Mohammed El Baradei announced that Turkey had "achieved IAEA Milestones related to establishing a regulatory framework and controlling occupational radiation exposure."¹⁶ Since then, Turkey has been collaborating with the IAEA in order to enhance its current regulatory and supervisory capacity.

From a global nonproliferation perspective, there are various aspects of the Turkish civilian nuclear energy program that are exemplary. Turkey's access to peaceful use of nuclear energy is supported by Article IV of the NPT. Turkey is also a donor country to the IAEA's Peaceful Uses Initiative, along with the United States, to supplement the Technical Cooperation Fund.

Turkey is a member of the IAEA, and abides by the U.N. Security Council Resolution 1540 (2004), which is aimed at preventing the proliferation of weapons of mass destruction to non-state actors. Turkey is also a signatory to the following nuclear safety and security regimes:

- The Treaty on the Nonproliferation of Nuclear Weapons (NPT),
- Additional Protocols with the IAEA to enhance verification of peaceful uses
- Convention on Nuclear Safety, Convention on the Physical Protection of Nuclear Materials (CPPNM) and its 2005 Amendment
- the Paris Convention on Third Party Liability in Nuclear Energy
- Convention on Early Notification of a Nuclear Accident
- Joint Protocol on Vienna and Paris Conventions
- the International Convention for the Suppression of Acts of Terrorism

Turkey collaborates closely with the IAEA to develop national plans and procedures on the physical protection of nuclear materials, and abides by the IAEA Code of Conduct on the Safety and Security of Radioactive Sources. In 2018, Turkey signed its third Country Program Framework for technical cooperation with the IAEA.

Turkey has made progress on the development of its nuclear power infrastructure, legislation, and regulations based on the findings and recommendations of the 2013 Integrated Nuclear Infrastructure Review

¹⁴ "Japan to scrap Turkey nuclear project," *Nikkei Asian Review*, December 4, 2018, at: <https://asia.nikkei.com/Economy/Japan-to-scrap-Turkey-nuclear-project>

¹⁵ "Turkey reveals location of planned third nuclear plant," *Daily Sabah*, October 14, 2015, at: <https://www.dailysabah.com/energy/2015/10/14/turkey-reveals-location-of-planned-third-nuclear-plant>

¹⁶ Mohammed ElBaradei, "Nuclear Power: A Changing Landscape by Director General," Address to the Turkish Atomic Energy Authority, July 7, 2006, at: <http://www.iaea.org/newscenter/statements/2006/ebsp2006n011.html>

(INIR).¹⁷ It has also established an effective coordination and regulatory mechanism involving the Turkish Ministry of Energy and Natural Resources, Turkish Atomic Energy Agency, and the newly established Nuclear Regulatory Authority (NDK), addressing the main call from the INIR findings to have an independent regulator.

However, when it comes to the implications of having a nuclear power plant built, owned, and operated by the Russian Federation on Turkish soil, there are additional considerations that Turkey needs to address in order to ensure the nuclear safety and security of its NPPs through national preparedness and emergency response plans.

Climate Security

As a large mid-income nation, Turkey has responsibilities in joining international efforts to mitigate climate change. With heavy coal utilization, mega projects, and relatively steady economic growth, Turkish industry contributes to greenhouse gas emissions and is lagging behind on energy efficiency to help move away from fossil fuels.

While historically Turkey does not consider itself to be in the Middle East, it is indeed located in Asia Minor. It is adjacent to one of the most volatile and fragile regions in the world when it comes to the imminent threats posed by climate change. Water scarcity in an active civil conflict without a comprehensive mitigation strategy adds to Turkey's concerns with respect to Syria's future.¹⁸

According to the Intergovernmental Panel on Climate Change (IPCC), Turkey is considered "highly vulnerable to drought, land degradation, and desertification.. about 60% of Turkey's land area is characterized with hydro-climatological conditions favorable for desertification."¹⁹

According to the World Wildlife Fund's (WWF) "Turkey's Tomorrow Project", after 2030, on average, there will be a 4 degrees Celsius increase in winter temperatures, and 6 degrees Celsius increase in summer temperatures in Turkey.²⁰ Being located in the Mediterranean Basin, it is expected to be hit by higher drought risks, water stress impacts on agriculture and food production, as well as floods and hail storms due to sudden changes in temperature.

Considering that all three nuclear power plants, including Akkuyu, will be located by the shore, sea level rise in the Mediterranean and Black Seas, in addition to coastal erosion, are of significant concern. In addition, Turkey, as well as the Akkuyu NPP, is in an active seismic zone. With the Fukushima and Chernobyl nuclear accidents in collective memory, Turkey needs to develop robust safety measures to alleviate domestic, regional, and international concerns. These measures address design safety, emergency planning, resilience to natural disasters such as earthquakes, and environmental concerns, i.e. radiation protection and waste management.

Turkey is one of the first countries to publish on the security implications of climate change in its defense planning. Turkey's National Security Council has included water security and global warming in its

¹⁷ "IAEA Reviews Turkey's Progress in Nuclear Power Development," International Atomic Energy Agency, November 14, 2013, at: <https://www.iaea.org/newscenter/news/iaea-reviews-turkeys-progress-nuclear-power-development>

¹⁸ For more analyses on the security implications of climate change in the Near East, please see Werrell, Femia and Sternberg, "Did We See it Coming? State Fragility, Climate Vulnerability, and the Uprisings in Syria and Egypt," SAIS Review of International Affairs, Volume 35, Number 1, Winter-Spring 2015, pp. 29-46.

¹⁹ "Climate Change and Land," IPCC, August 7, 2019, p.22, at: <https://www.ipcc.ch/site/assets/uploads/2019/08/Fullreport-1.pdf>

²⁰ "Turkiye'nin Yarinlari Projesi Sonuc Raporu," World Wildlife Fund, April 2010, at: http://d2haw-iim0tjbd8.cloudfront.net/downloads/wwf_turkiyenin_yarinlari_projesi_final_raporu.pdf?3420

policy documents. Turkish Armed Forces periodicals and strategic research centers have conducted case studies on targeting of Turkey's water resources by Syria and Iraq.²¹

Turkey's national authority, The Ministry of Environment and Urbanization defines climate change as a national security issue.²² As an accession country in the "forever candidate" category, Turkey has been coordinating its climate change mitigation efforts with the European Union. Some key initiatives have included "Enhancing Required Joint Efforts on Climate Action Project," and "Capacity Building in the Field of Climate Change in Turkey Grant Scheme," both aiming to enhance public understanding and stakeholder capacity in pre-accession countries to gradually align with EU climate policy and legislation.²³

On the national front, Turkey has a "National Sustainable Energy Action Plan" and "Black Sea Climate Change Action Plan"- with a second action plan in the works for central Anatolia. In addition to addressing energy needs, the Akkuyu project company points to the role of nuclear energy as an alternative, more environmentally friendly source of energy, which can reduce carbon emissions in light of Turkey's increasing energy needs.

One of the key impediments to Turkey's pledges to climate change mitigation pledges is finance. Turkey has not yet ratified the Paris Agreement, despite being a member of the United Nations Framework Convention on Climate Change (UNFCCC.) As an Annex I and Annex II country, Turkey does not qualify for funds to fight climate change.

Nuclear Safety and Security

When complete, Akkuyu NPP will be the first nuclear power plant established by a "build-own-operate" (BOO) model. Key concerns on the Turkish nuclear energy program relate to the uncertainties related to the implementation of this model, the independence of the national regulatory authority, and the information asymmetry between the regulator, i.e. Turkey, and the operator, i.e. the Russian Federation. It also minimizes the project company's incentive to invest in maximizing safety and security measures due to cost concerns. Rosatom has an incentive to finish the plant on-schedule and to save money as much as possible during the construction. It increases Turkish vulnerability and dependence to the technology suppliers, unless it builds a strong indigenous oversight capacity. Yet, this regulator needs to be independent from political authority. Currently, the chairman of the Nuclear Regulatory Authority and the Turkish Atomic Energy Agency (TAEK) are appointed by the Turkish President.

Analyzing the security threats to Turkey's future nuclear reactors, key measures would need to be designed in response to physical security, insider threats to theft and divergence of sensitive materials, inadvertent access, sabotage, terrorism, and emerging threats such as cyber attacks.²⁴

One of the key, unresolved concerns with respect to Turkey's nuclear power program remains the treatment of spent fuel and radioactive waste. According to the agreement with Russia, waste management is the responsibility of the Akkuyu project company and all spent fuel will be shipped back to Russia for storage and possible reprocessing, contingent upon an agreement, which has yet to be negotiated. The main security risks of spent fuel are temporary storage at or near the nuclear plant and transportation to permanent storage.

²¹ Ibrahim Al-Marashi "Turkey," in Daniel Moran (ed.), *Climate Change and National Security*, Georgetown University Press, Washington D.C. 2011, p. 159.

²² "Climate change is a national security issue: Turkey," *Anatolian News Agency*, December 11, 2019, at: <https://www.aa.com.tr/en/environment/climate-change-is-national-security-issue-turkey/1670673>

²³ "Enhancing Required Joint Efforts on Climate Action Project," *Iklimin*, at: <http://www.iklimin.org/en/proje-hakkinda/>

²⁴ Can Kasapoglu, Doruk Ergun, "Securing Turkey's Prospective Nuclear Energy Program: A Strategic Nuclear Security Risk Analysis," in *Nuclear Security: A Turkish Perspective*, 2015, pp. 5-17.

In terms of human resources development, Turkey remains dependent on Russia in training the personnel for the Akkuyu NPP. Turkey sends students to the Moscow Engineering Physics Institute to be trained in nuclear engineering programs, in the Russian language, as well as on-the-job training at Russian nuclear power plants to work at Akkuyu later. Turkey does have strong nuclear engineering programs at universities such as Hacettepe and ITU. However, Turkey has not published a national capacity-building strategy, especially for oversight of licensing, construction, and operation of nuclear power plants.

In terms of design basis threat; i.e. attributes of the nuclear power plant for potential unauthorized access against which a physical protection system is designed; Russian Federation is responsible for the design of the reactors at Akkuyu Nuclear Power Plant (NPP). Yet, this information is on paper and has not been put to test in practice over extended periods. Therefore, Turkey will need to develop independent capacity, including the personnel, sufficient funding and the organizations, to oversee these new reactor designs, construction and operation. Specifically, existing Turkish laws need to be amended to include regulation of detailed safety and security requirements for nuclear power plants to be taken into account within the licensing procedure.

At the Akkuyu site, physical protection and emergency planning are joint responsibilities of the Turkish and Russian sides and have not yet been clearly defined. The safety and security of the facility is the primary responsibility of the Akkuyu operator, yet Turkey is responsible for responding to calls for security support and preventing unauthorized access.

Another important aspect is public communication and transparency. In May 2019, reports in Turkish media indicated that there was a crack in the Akkuyu Nuclear Power Plant's foundation. While TAEK, the Turkish authority, did not deny the incident and reported their instruction for redoing the foundation, Rosatom officials refuted the incident.²⁵

Regional Security

In recent years, the divergence between Turkey's and U.S./NATO's definition of 'threat' has grown due to Turkey's economic and political ambitions in the Middle East. Turkish policy makers lack confidence in NATO guarantees and fear abandonment, while some NATO allies question Turkey's intentions and future strategic orientation. One important factor contributing to this mistrust is Turkey's growing aspiration towards a strategic partnership with Russia. Another turning point has been the failed coup attempt of July 2016 leading to a major restructuring of the Turkish armed forces and bureaucracies, as well as further mistrust and disagreements with the US.²⁶

Presidents Putin and Erdogan have emphasized the importance of compartmentalizing their political disagreements from their economic and strategic interests, particularly in energy cooperation. The top pillar of the countries' energy ties is the Akkuyu Nuclear Power Plant (NPP). The TurkStream natural gas pipeline, which is being built through Turkey to supply Russian gas to Europe and bypass Ukraine, is another pillar. Outside of energy cooperation, Turkish acquisition of a S-400 air and missile defense system has paved the way to possible U.S. CAATSA sanctions, expulsion of Turkey from the F-35 Joint Strike Fighter consortium, and concerns regarding NATO interoperability of Turkish Air Force.

The emerging Turkey-Russia relationship, however, has not been immune to crises; as seen in the 2014 Russian annexation of Crimea and Ankara's protection of Crimean Tatars, the downing of a Russian jet in 2015 by Turkish forces, and the ongoing clashes in northern Syria, where Turkey is fighting Russia-

²⁵ "Nukleer santral temelinde catlak," *Haberturk*, May 6, 2019, at: <https://m.haberturk.com/son-dakika-nukleer-santral-temelinde-catlak-2452726-amp?>

²⁶ According to the Turkish government, Fethullah Gulen, an imam residing in exile in the US, is the leader of a terrorist cult that order the July 15th coup attempt. Despite repeated pleas by Turkish authorities, U.S. officials claim that there is not enough evidence to extradite Gulen.

backed Assad regime forces. While Turkey and Russia are working together to address immediate challenges in Syria, the fundamental objectives of the two countries in the region are ultimately incompatible. This is further demonstrated by their backing of opposing sides in the Libyan civil war. The highly political nature of projects such as the Akkuyu Nuclear Power Plant (NPP) prove that the misalignment of these strategic interests could pose severe challenges to the sustainability of economic cooperation.

CONCLUSION

Operating in a very difficult neighborhood, Turkey perceives energy cooperation as an important tool in regional politics. Even though some express concern regarding the weapons-potential of the Turkish nuclear energy program, in its current configuration, it does not provide Turkey with capabilities, material or expertise needed for nuclear weapons, since the program is entirely designed and operated by Russia. More importantly, as a NATO member, Turkey benefits from extended deterrence, eliminating the need for a nuclear-armed Turkey.

The biggest concern regarding Turkey's nuclear energy plans is not its peaceful nature; it is the lack of Turkish regulatory oversight and the financial model, which gives Russia incentives to lower costs by sacrificing safety and security. The current political impasse in Turkey-Russia relations based on the clashes in Idlib, Syria also proves that the energy diversification argument contradicts the potential dependency on Russia for nuclear technology and fuel in addition to natural gas.

While Turkish Armed Forces have clearly called out the security implications of climate risks in Turkey's neighborhood, the destabilizing nature of these threats have not been integrated into Turkey's nuclear power strategy, beyond the call for reducing carbon emissions. Considering the importance of the availability of cooling water for nuclear power plants and the location of Turkey's prospective plants along the shoreline, potential drought and changes to the sea level due to climate change remain as key challenges in operation of civilian nuclear facilities in the region.

Recognizing these vulnerabilities, as a responsible newcomer to nuclear energy, Turkey should further adopt a set of recommended measures related to safety, security, and nonproliferation including continuing to collaborate with the IAEA to improve its nuclear regulatory framework. These measures should also incorporate the country's plans for climate risk mitigation and emergency preparedness, as Turkey takes more ownership of its prospective nuclear power plants.

While Turkey's close cooperation with Russia in the nuclear sector remains as a roadblock in cooperation with the US, recent Track II dialogues reveal that there is demand by both Turkish and U.S. policymakers to continue the dialogue on sharing best practices on nuclear safety and security, enhancing nuclear security culture, and capacity building in nuclear newcomer nations through continued U.S. assistance.

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