



Atlantic Council



تريندز للبحوث والاستشارات
TRENDS RESEARCH & ADVISORY

PROSPECTS FOR COOPERATION IN ENERGY TRANSITION FOR A SUSTAINABLE FUTURE: GCC, TURKEY, AND REGIONAL PERSPECTIVES





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Prospects for cooperation in energy transition for a sustainable future: GCC, Turkey, and regional perspectives

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Prospects for cooperation in energy transition for a sustainable future: GCC, Turkey, and regional perspectives

By: Atlantic Council IN TURKEY & TRENDS Research and Advisory



The Gulf Cooperation Council (GCC) and Turkey share mutual challenges posed by climate change while, at the same time, possessing important synergies in the energy sector that deserve further exploration from policymakers and the private sector.

With the shared goals of reducing carbon emissions, ensuring energy security, and stimulating economic growth in perspective, [TRENDS Research & Advisory](#) and the [Atlantic Council in Turkey](#) are proud to present our joint publication on Prospects for Cooperation in Energy Transition for a Sustainable Future: GCC, Turkey, and Regional Perspectives. We hope this publication will contribute to the important discussion of the need for

international and regional cooperation to accelerate the adoption of clean energy and address climate change. Our joint publication represents a starting point and roadmap for future cooperation.

Diversifying the energy mix through clean energy enhances energy security for both regions. By reducing reliance on fossil fuels, the GCC and Turkey can shield themselves from geopolitical uncertainties and price fluctuations in the global oil and gas markets. By sharing knowledge and best practices, they can accelerate climate adaptation, making the transition more efficient and cost-effective. Collaboration in clean energy projects can also promote regional stability at this critical time of uncertainty by fostering economic ties and mutual interests.

The joint publication explores prospects for partnership between the GCC countries and Turkey to accelerate energy transition and clean-energy deployment. The goal is to diagnose the current state of renewables adoption in Turkey and the GCC, identify potential areas for cooperation in aligning their net-zero emissions targets, and produce a set of policy recommendations to accelerate the transition. The publication underscores the imperative of shared efforts, knowledge exchange, and sustainable initiatives to fortify regional stability and contribute to a resilient, low-carbon future.

May our joint efforts to address the challenges of climate change and foster clean-energy cooperation serve as a testament to the power of regional partnerships in shaping a more secure, resilient, and interconnected world.

An introduction to regional perspectives on climate change: Gulf Cooperation Council and Turkey

By: Dr. Serhat S. Çubukçuoğlu



This is part of an essay series on the mutual challenges posed by climate change and opportunities presented by the energy transition that the Gulf Cooperation Council (GCC) and Turkey share.

The world is at a critical juncture to address climate change. In accordance with Goal 13 of the United Nations (UN) Sustainable Development Goals, the 2015 UN Framework Convention on Climate Change (UNFCCC) COP21 summit in Paris set a cornerstone agreement in the global energy revolution, bringing 175 countries into a common cause to curb net carbon-dioxide (CO₂) emissions and limit global temperature rise to 2 degrees Celsius (°C).

This year, the United Arab Emirates (UAE) has the honor of hosting the COP28 summit and welcoming around two hundred nationalities to address today's most important global challenge. To avert the worst impacts of climate change and preserve a livable planet, greenhouse-gas (GHG) emissions need to be reduced by 45 percent by 2030 and reach net zero by 2050. COP28 may be the last opportunity to turn national commitments into action and avoid risks of abrupt, unpredictable, and potentially irreversible changes in our habitat.

COP28's success hinges on delivering stronger commitments to curb carbon emissions, expanding financial help to manage the green transition, and developing multilateral approaches on regional climate governance in the Middle East. However, observable exchanges between regions seldom happen; each country follows its own climate policies instead of creating much-needed cooperation. If current trends continue, many parts of the Middle East could become uninhabitable in this century. This report aims to break these silos and build on the momentum of growing economic ties between Turkey and the GCC that would bring collective gains in energy transition.

Achieving net-zero emissions requires all governments, especially the major emitters, to significantly enhance their Nationally Determined Contributions (NDCs) and take immediate, bold actions to reduce emissions. At a global level, the energy industry is the source of approximately 75 percent of GHG emissions and plays a crucial role in preventing the severe impacts of climate change.

Shifting away from coal, gas, and oil-based power and toward renewable sources such as wind or solar energy could significantly decrease carbon emissions. Despite the worldwide move toward cleaner energy, the Middle East is falling behind in its efforts to achieve net-zero emissions goals. Accelerating energy transition toward zero-carbon solutions is the key to building a more sustainable future in the region.

Technology diffusion is occurring at an unprecedented rate. Globalization helped to accelerate adoption of renewable-energy technologies at levels far higher than those of just ten years ago. The cost of solar power is now cheaper by 90 percent, and wind power by 60 percent. The International Energy Agency (IEA) estimates that 60 percent of energy investments globally in the next fifteen years will be in clean-energy sources. Annual clean-energy investment has risen at double the rate of investment in fossil fuels during 2021–2023. Although more than 90 percent of the increase in clean-energy investment has taken place in developed countries and China, the Gulf Cooperation Council (GCC) and Turkey are among the few bright spots in the Global South that placed special emphasis on renewables adoption.

Over time, the GCC countries demonstrated that it is economically, environmentally, and socially beneficial to invest in clean energy and other carbon-mitigation strategies, while Turkey fostered environmentally friendly, innovative policies to decarbonize energy through market liberalization, public-private partnerships, technology transfer, and financial assistance for green investments. Turkey and the GCC share significant opportunities for

synergy in the adoption of clean energy, owing to their differences in energy resources and comparative advantages.

The GCC countries, with their vast financial capital, can invest in Turkey's clean-energy projects. These investments can support the development of renewable infrastructure and technologies, fostering collaboration between the regions, while also diversifying the GCC's portfolio of investments abroad. Turkey can share its technology know-how, adaptation roadmap, and energy-efficiency mechanisms with the GCC to advance the mutually beneficial partnership.

As TRENDS Research & Advisory and the Atlantic Council, it is our distinct pleasure to present this joint publication exploring prospects for deepening cooperation between Turkey and the GCC countries in pursuit of the clean-energy transition. This timely joint report delivers four articles from renowned experts in climate change, energy transition, and geopolitics of energy security that shed light on the most pressing challenges of our time.

In *Cooperation in Energy Transition between the GCC and Turkey*, Mouza Almarzooqi discusses how dedicating financial resources and efforts toward energy-efficient projects would lead to the adoption of carbon-free and green industries and infrastructure projects. In *Turkish Energy Transition 3.0: Go Together!*, Eser Özdil takes readers through a journey on Turkey's energy transition and its approach to developing international cooperation in renewable investments. In *Synergy Between Electric Mobility and Renewable Energy: Turkey's Connection with GCC Nations*, Melek Öztürk explores ambitious environmental targets set by Turkey and the GCC nations,

and how they focus on renewable energy, electric vehicles (EV), and innovative technologies to drive sustainable practices. In *Complementary Transitions: Turkey, GCC, and the Energy of Tomorrow*, Karim Elgendy explores how Turkey and GCC countries can combine their unique expertise and resources to unlock greater energy security and sustainability for both regions.

We wish you enjoyable, enlightening reading!



How GCC and Turkey can go together toward a sustainable future

By: Eser Özdil



This is part of an essay series on the mutual challenges posed by climate change and opportunities presented by the energy transition that the Gulf Cooperation Council (GCC) and Turkey share.

Introduction

Since the mid-1980s, Turkey's priority has been to meet the increasing energy demands caused by industrialization and population growth. On the one hand, Turkey is involved in many pipeline projects to supply oil and natural gas, especially from neighboring countries. On the other hand, it has focused as much as possible on electricity production from domestic and renewable resources. In this context, Turkish decision-makers gave high importance to bringing high hydroelectric potential to the economy and strongly

encouraged the rapid construction of wind and solar power plants, with various purchase guarantees and support mechanisms for both since the 2000s.

While Turkey's primary energy demand was 53 million tons oil equivalent (mtoe) per year in 1990, this figure increased to 147 mtoe by 2020. In the process, Turkey's energy policies were shaped around two main axes. The first priority was supply security, while the secondary priority was to ensure the most reasonable prices possible for energy imports, as Turkey heavily depends on fossil fuels (natural gas, oil, and coal), which meet roughly 80 percent of Turkey's primary energy demand. Just as the increase in global oil prices following the outbreak of the Iraq War in 2002 seriously affected Turkey, it was one of the countries most affected by the increase in oil and natural-gas prices during the Ukraine War. It should be noted that Turkey paid \$97 billion for energy imports in 2022, breaking its all-time record.

Turkey will continue to face important challenges in the future. According to the [National Energy Plan \(NEP\)](#) published by the Ministry of Energy and Natural Resources (MENR) in 2022, Turkey's primary energy demand will increase to 205 mtoe in 2035. While the installed power-plant capacity will increase from 105 gigawatts (GW) to 189.7 GW, the new capacity will consist largely of solar and wind-power plants. In this context, the challenge of managing energy transformation in line with global trends will be added to Turkey's priorities of supply security and affordability. It is important to underline that Turkey's concept of energy transformation is evolving toward a more liberal market structure with a smart transformation strategy, while transitioning to a carbon-

neutral economy without increasing costs for the end consumer. This process will include many cooperation opportunities, especially for joint investments in renewable-energy facilities, electricity and gas distribution, grid modernization, optimization, digitalization technologies, hydrogen and ammonia production, and so forth.

Turkish energy transition 1.0

Alparslan Bayraktar, Turkey's minister of energy and natural resources (MENR), defined the country's energy policies between 2002 and 2018 as Energy Transition 1.0 [in an article he wrote for Turkish Policy Quarterly](#) in 2018, when he served as the deputy minister. Bayraktar summarized the priority policy set for the sector, which attracted more than \$60 billion of investment in this process, as part of the transition to a more transparent and competitive energy market. Indeed, after the AK Party first came to power in 2002, it launched broad privatization and liberalization policies for all segments of the energy sector. In this period, electricity-distribution companies and natural-gas utilities—with the exception of Istanbul's gas-distribution firm İGDAŞ—were privatized. While some publicly owned power plants were privatized, the private sector's share of electricity production increased to 80 percent. The most important point here is that most of these investments were carried out in line with liberalization and free-competition principles, without long-term guaranteed-purchase contracts. In addition, the market structure was strengthened by the unbundling of vertically integrated public companies.

Turkish energy transition 2.0

Bayraktar states that Turkey has moved to version 2.0 in energy transformation within the framework of [the National Energy and Mining Policy \(NEMP\)](#) published by MENR back in 2017. He explains NEMP's three main pillars as "security of supply, localization, and predictability in the markets."

In this context, Turkey's infrastructure investments between 2017–2023 have almost permanently solved the supply security problem. By increasing the capacity of land-based liquefied-natural-gas (LNG) terminals and commissioning new floating storage regasification units (FSRU), Turkey's daily LNG regasification capacity has exceeded 140 million cubic meters (mcm). In addition, with the increase in the capacity of the Silivri Underground Natural Gas Storage facility and the commissioning of the Tuz Gölü Natural Gas Storage facility, Turkey's annual natural-gas storage capacity reached 6 billion cubic meters (bcm). With the commissioning of international natural-gas pipelines such as TurkStream and Trans-Anatolian Pipeline (TANAP), Turkey achieved resource and route diversity. With a gas entry capacity of more than 400 mcm per day, Turkey not only meets its domestic needs but has become a supplier to neighboring countries, with state-owned BOTAŞ signing gas-export agreements with Bulgaria, Romania, Hungary, and Moldova. The discovery of the Sakarya gas field in the Black Sea and the increase in oil production are also among the important developments during this period. There are also established oil, oil products, and gas import and trade relations between Turkey and Gulf Cooperation Council (GCC) countries. As

Qatar emerges as one of Turkey's most important LNG suppliers, Saudi Arabia supplies roughly 5 percent of Turkey's crude-oil demand. Saudi Arabia and the United Arab Emirates (UAE) supply gasoline, diesel, and other relevant oil products to Turkey. Last but not least, BOTAŞ recently signed a 1.4-bcm LNG-offtake agreement with Oman LNG company.

Renewable-energy investments are also gaining momentum in the field of electricity generation. After triggering these investments through a feed-in, tariffs-based support mechanism (YEKDEM) elaborated in December 2010, the new strategy brought further investment opportunities to Turkey. This entailed a "renewable energy resource zone (RE-ZONE) competition mechanism," which encouraged investors not only to build power plants but also to manufacture renewable-energy equipment in Turkey. This RE-ZONE model aims to both utilize renewable resources and reduce the country's current-account deficit with locally manufactured equipment. Considering investments since the new approach was announced, installed wind capacity increased from 7 GW to almost 12 GW, and solar capacity increased from 5 GW to 10.1 GW.

There is still much to do in the market-liberalization sphere. Especially in the natural-gas market, BOTAŞ' dominant position in both imports and the domestic market prevents the formation of a gas market with liquidity. In addition, subsidizing domestic-market sales prices from time to time also harms market predictability. This situation also negatively affects Turkey's strategy to become a natural-gas hub, which is a widely discussed topic. Similarly, the pricing policy of the public company EÜAŞ also emerges as

an important issue. For this reason, it is of great importance to eliminate interventions through public companies and generate healthy price signals.

Turkish energy transition 2.0

Transitioning to carbon-neutral economies has emerged as a must rather than a necessity. However, the threats faced by our planet and humanity, especially global climate change, clearly demonstrate that no country can overcome these challenges alone. The phenomena of decarbonization, decentralization, digitalization, and diversity (4D) force all countries to cooperate in this journey.

For this reason, Bayraktar argues that the energy transition should be smart, and he summarizes the main parameters of this [smart transition](#) as an energy transition that is inclusive, responsive, flexible, rational, and digital. The minister has explained: "What Turkey foresees is a smart energy transition, where decisions are made rationally, not emotionally, for the purpose of maintaining our supply security, diversifying our energy mix, and transforming Turkey into an energy hub, becoming a safe space for investors. In line with this objective, we will continue to increase our oil and natural gas production as well as build nuclear power plants to diversify our energy mix."

At this point, NEP targets should be examined. Turkey, which plans to become a carbon-neutral economy by 2053, has set challenging targets for 2035. The most challenging is to increase the total installed power-plant capacity to 189.7 GW (it is currently 105 GW). To achieve these targets, it aims to invest mainly in wind and solar

power plants and reach capacities of 52.9 GW and 29.6 GW, respectively. Another goal is that approximately 5 GW of the installed wind power will be offshore, and studies on this issue continue in close cooperation with the World Bank. Various companies are interested in investing in offshore wind projects in Turkey, and the UAE's Masdar is also closely following developments there. [A study](#) published by the World Bank in 2019 stated that Turkey's total offshore wind power-plant potential was around 75 GW. [TÜREB](#) states that Turkey's total wind potential is around 150 GW. Similarly, [GÜNDER](#) stated that Turkey's total solar potential is more than 150 GW.

Another of Turkey's priorities is to invest in base-load nuclear energy and battery facilities to manage the energy-transformation process in a healthy way. According to the NEP, Turkey aims to reach 7.2 GW of installed nuclear-power capacity by 2035. In addition to conventional nuclear-power plants, small-scale nuclear powerplants (SMR) have become among Turkey's priorities. Bayraktar recently announced in an interview with the [Turkish television channel NTV](#) that the ministry wants to reach a total SMR capacity of 5 GW. In the long term, Turkey plans to have a significant share of nuclear power in its electricity-generation portfolio.

In battery investments, Turkey aims to have an installed capacity of 7.5 GW in 2035. However, pre-license applications to the Energy Market Regulatory Authority (EMRA) have already exceeded 90 GW. Undoubtedly, most of these applications will not be implemented, but the interest in the sector suggests that investments realized in the coming period may be above the level planned by the ministry.

Another priority for Turkey will be green- and blue-hydrogen investments, especially for industrial use. According to the NEP, the target is 5 GW of electrolyzer capacity in 2035. Though hydrogen projects in both Turkey and GCC countries are at the early stage, Turkey and Saudi Arabia announced establishment of working groups on development of hydrogen-production technologies. [In the hydrogen strategy paper](#) published by the ministry, the targeted capacity is 70 GW by 2053. Considering both its renewable-energy potential and its proximity to Europe, Turkey can be an important hydrogen producer and exporter. While it's very early to make sound forecasts about hydrogen production and demand, Europe has a clear strategy to increase hydrogen consumption to replace fossil fuels. The Gulf region and North Africa are emerging as the cheapest hydrogen-producing regions with high-efficiency, renewable-energy production as per [International Energy Agency \(IEA\)](#) data. Turkey is also a key country, considering its status as a transit option and its significant renewable-energy deployment. That's why the future will see strong cooperation between Turkey and GCC countries.

At this point, Turkey's main approach is to develop international cooperation. In this context, during President Recep Tayyip Erdoğan's visits to the UAE, Qatar, and Saudi Arabia in July 2023, memoranda of understanding (MoUs) were signed regarding investments with a total size of \$29.7 billion. These planned investments will be made in renewable energy, including offshore wind, solar energy, clean hydrogen, and nuclear power, in line with Turkey's future projections. [Within the scope of the visit](#), an agreement was signed between [Limak and Alpha Dabi](#) to

realize joint investments, including in the energy sector. The strategic-cooperation agreement signed between Abu Dhabi National Oil Company (ADNOC) and Türkiye Petrolleri Anonim Ortaklığı (TPAO) also stands out as important.

Similarly, Turkish and Saudi Arabian leaders decided to [develop cooperation in energy fields](#), including renewable energy, electricity interconnection between the two countries, electricity exports from Turkey to Europe, energy efficiency, innovation and clean technologies for hydrocarbon resources, low-carbon fuels such as clean hydrogen, and nuclear energy. They expressed their desire to explore cooperation options regarding areas of peaceful use and the regulatory aspects of these areas.

Even before these trips, the interest of GCC companies in Turkey was remarkable. In 2022, International Energy Holding, a subsidiary of International Holding Company, acquired a 50-percent stake in Turkish renewable-energy company Kalyon Enerji for [\\$490 million](#). As [Bloomberg](#) reported earlier, Masdar is interested in buying shares of Fiba Energy, an owner of wind farms in Turkey. Clearly, there is a convergence of priorities and policies between Turkey and GCC countries regarding the energy transition. Developing political relations will be further cemented by economic investments.

Conclusion

Both Turkey and GCC countries seem aligned in terms of green-energy transition strategies. While Turkey has large industrial production capacity, as well as substantial

experience and know-how in renewable-energy power-plant installations, GCC countries have ample financial capacities and huge renewable-energy deployment potential thanks to long sunny seasons. On top of that, Gulf countries are also looking for lucrative investment opportunities around the world. Therefore, strategies and economic aspects of both sides seem to complement each other. Thanks to financial capabilities, Gulf countries can invest in Turkish companies and/or develop common projects in both Turkey and the Gulf region. Erdogan's working trips to Gulf countries and signed MoUs are clear signals of future joint steps.



Charting energy transitions in the Eastern Mediterranean and Arabian Peninsula

By: Karim Elgendy



This is part of an essay series on the mutual challenges posed by climate change and opportunities presented by the energy transition that the Gulf Cooperation Council (GCC) and Turkey share.

The eastern Mediterranean and the Arabian Peninsula share sunny skies and unique geopolitical locations. Their largest economic powerhouses, the Gulf Cooperation Council (GCC) and Turkey, share progressive plans to decarbonize their economies by the middle of the century. However, their energy-transition pathways are propelled by distinct forces.

As Turkey's appetite for energy rapidly grew, its reliance on imported natural gas left it critically vulnerable to supply shocks, price volatility, and geopolitical pressures. Thus, Ankara views investing in renewables, nuclear power, and hydrogen as crucial to enhancing its energy security. In contrast, the hydrocarbon-exporting Gulf nations are seeking to future-proof their economies in a decarbonizing world by proactively diversifying into solar, wind, and hydrogen production. While their motivations differ, Turkey and the GCC both understand that their energy systems must evolve for economic reasons.

Securing supply through diversification

Turkey's energy demand has increased in recent decades due to population growth, industrialization, economic development, and rising living standards. This has made it heavily reliant on imported fossil fuels, especially natural gas, which has a [roughly 30-percent share](#) in its energy mix. To enhance energy security and meet rising electricity demand, it has focused on diversifying its power-generation portfolio.

Hydroelectric dams have long been Turkey's main renewable-electricity source. But installed capacity of solar and wind power expanded rapidly since 2014, more than doubling renewables' share of [total generation](#) to 42 percent by 2022. Turkey's mountainous geography provides substantial potential for additional hydropower, while its western and southern regions have favorable wind and solar resources.

Under its 2053 net-zero [emissions pledge](#), Turkey aims to double electricity capacity by 2035, with

renewables providing nearly 65 percent of power. Wind and solar capacity are slated to scale up dramatically. Turkey has strong project pipelines, with wind projects largely on track. However, solar growth has lagged targets so far. Beyond renewables, [nuclear power](#) from new plants will provide 11 percent of Turkey's electricity by 2035.

While pushing renewables, Turkey seeks greater fossil-fuel production and supply diversification to ensure energy security during the transition period. Turkey is planning expansion of its [coal](#) and gas electricity-generation capacity by 3 and 10 gigawatts (GW), respectively, but both are expected to fall after 2030. Expanding natural-gas exploration resulted in major discoveries in the Black Sea, which could provide up to [30 percent of Turkey's gas demand](#). But regional disputes have hindered Turkey's ambitions to become an Eastern Mediterranean gas hub.

Alongside its renewable-energy plans, Turkey also plans major deployment of battery storage and green-hydrogen production to provide grid flexibility. [Hydrogen output](#) could reach 0.75 million tons annually by 2035 and 10.5 million tons annually by 2053, most of which would be available for export to Europe. Blending hydrogen into gas networks is also envisioned.

Securing supply through diversification

Like Turkey, the GCC states have witnessed substantial energy-demand growth in recent decades, driven by population growth and rising living standards. This rising domestic demand initially increased reliance on oil and

gas before GCC states took measures to manage demand, diversify their energy mix, and free up more oil and gas for export.

Solar-power capacity has expanded rapidly in Saudi Arabia, Qatar, Oman, and the United Arab Emirates (UAE), where it now represents 8 percent of electricity generation. Under its [2060 net-zero pledge](#), Saudi Arabia aims to add 59 GW of solar and wind capacity by 2030 and source 50 percent of its electricity from renewables. The UAE has similarly ambitious targets, aiming for 30-percent [clean power by 2031](#), which includes both renewables and nuclear power. The UAE is the only GCC country with a functional nuclear plant.

While adding renewables, the GCC still seeks to maximize oil and gas output for export. The bloc is expanding upstream investments to increase capacity. Saudi Aramco and UAE's ADNOC, the national oil companies, are planning massive oil and gas investments. Meanwhile, Qatar's North Field expansion will significantly boost its natural-gas exports.

Capitalizing on their energy expertise and cheap solar energy, GCC states are also well positioned to enter the low-carbon hydrogen market. This includes production of both green hydrogen from renewable sources and blue hydrogen from natural gas with carbon capture. With most of the planned production slated for export, the GCC aims to meet growing global demand for hydrogen in hard-to-decarbonize sectors.

The UAE, which delivered the region's first hydrogen shipment to Germany, has set a goal of becoming a leading [global producer of green and blue hydrogen](#) by 2031. It plans to capture 25 percent of global trade with

production of 1.4 million tons annually, rising to 15 million tons by 2050. Saudi Arabia is building the world's [largest green-hydrogen plant](#) at NEOM, targeting 2.9 million tons by 2030 and 4 million tons by 2035. Similarly, [Oman](#) aims to produce at least 1 million tons of green hydrogen by 2030 and up to 8.5 million tons by 2050.

Turning geopolitical challenges into energy collaboration

Though their motivations for energy transition differ, Turkey and the GCC still have much to gain from collaboration that plays to their respective strengths. In solar power, Turkey could benefit from the GCC nations' extensive expertise from developing mega-scale projects in the Gulf's sun-drenched deserts. Investments in Turkey by GCC companies, such as the UAE's Masdar and Saudi Arabia's ACWA Power could leverage the GCC's financing and experience, while helping Ankara scale up photovoltaics rapidly. The GCC region could also benefit from Turkey's wind-power expertise, as was demonstrated in Masdar's [attempt to purchase](#) Turkish renewable-energy company Fiba.

Connecting the electricity grids between the GCC and Turkey would also help manage supply and demand fluctuations from renewable sources. Saudi Arabia already plans to link its grid with Iraq's, which could potentially be expanded to Turkey.

For both sides, joint development of green-hydrogen production facilities offers substantial synergies. With plentiful wind resources and local industries that can be powered by green hydrogen, Turkey could learn from the Emirati, Saudi, and Omani green-hydrogen experiences

and benefit from their investments. The GCC, in turn, could benefit from lower transportation costs for consumers and possible pipeline connectivity to the European hydrogen backbone. Channeling complementary strengths, such partnerships could help unlock their ambitions to be major hydrogen suppliers to Europe.

Turkey also has much to gain from the GCC's know-how in nuclear energy as it powers up the Akkuyu plant, which is operated by Russia's Rosatom. The UAE's Barakah project, the first Arab nuclear-power station, could provide a model for future reactors in Turkey.

While Eastern Mediterranean natural-gas collaboration faces geopolitical complexities, increased Qatari exports via the North Field expansion would benefit Turkey. Importing oil from the GCC countries could also help reduce Turkey's dependence on Russia, and diversify and create new markets for expanded GCC production capacity.

Finally, technical partnerships in renewable-energy research and development (R&D) between GCC and Turkish universities and companies would further strengthen these emerging energy ties. Planned research centers, such as the UAE's green-hydrogen R&D center, could present a basis for technical collaboration.

As Turkey and the GCC charge ahead with their respective energy transitions, it is clear they have much to gain from increased collaboration. By combining their unique expertise and resources, they can unlock greater energy security and sustainability. Such cooperation demonstrates the potential for these regions to fully incorporate energy in their economic partnership in pursuit of a better future for all.

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EV adoption could drive collaboration for renewable energy in Turkey and GCC

By: Melek Öztürk



This is part of an essay series on the mutual challenges posed by climate change and opportunities presented by the energy transition that the Gulf Cooperation Council (GCC) and Turkey share.

This article explores the ambitious environmental targets set by Turkey and the Gulf Cooperation Council (GCC) nations. Transportation emissions are a significant concern, and both regions are focusing on renewable energy, electric vehicles (EV), and innovative technologies to drive sustainable practices. This article highlights the potential for collaboration between Turkey and the GCC in renewable energy and EV adoption, as well as the importance of energy storage and carbon-capture technologies. The focus lies in

elucidating the significance and interconnectedness of these key components within the broader energy landscape, with the imperative role of EVs in the context of overall carbon-emission goals, renewable energy as a source of electricity to EVs and carbon capture where complete decarbonization is challenging, and energy-storage systems to enhance reliability of renewable resources. By analyzing and understanding these focal points, the article aims to provide valuable insights into the evolving energy paradigm and its implications for a more sustainable future for both regions.

Renewable energy and transportation emissions

In April 2023, Turkey unveiled an ambitious update to its Nationally Determined Contribution (NDC) targets, setting a commendable course for environmental action. It made a firm commitment to [reduce its greenhouse-gas \(GHG\) emissions](#) by a substantial 41 percent measured against the 2012 baseline, [which was previously 21 percent](#), by 2030. This new emission-reduction target equates to [695 million tons of carbon dioxide \(CO₂\)](#) in the year 2030, which would otherwise be 1,175 million tons. Moreover, Turkey is embracing a forward-looking vision by setting a target to attain [net-zero emissions](#) by the year 2053. The GCC nations have established ambitious environmental goals, aiming for zero emissions by 2050 in the cases of the United Arab Emirates (UAE) and Oman, and by 2060 for Saudi Arabia, Kuwait, and Bahrain. Qatar, while not currently committing to a zero-emission target, is focused on achieving a substantial [25-percent reduction in emissions](#) by 2030.

The journey toward reduced emissions is a multifaceted one, and Turkey is taking significant steps to address its

emissions profile. While the energy and industrial sectors are the major contributors to emissions, chiefly through coal utilization, it is noteworthy that the [transportation sector](#) plays a pivotal role, accounting for approximately 16.6 percent of the nation's emissions as of 2021. Also, renewable energy is already a significant part of [electric generation](#), with almost 52.8 percent of Turkey's energy coming from solar, wind, hydropower, and geothermal, and with solar and wind covering 21.3 percent of installed capacity as of September 2023. Turkey has a target of supplying 64.7 percent of its [installed electricity capacity](#) from renewable resources by 2035.

GCC countries' heavy reliance on oil and gas requires them to pursue a diversified energy strategy that incorporates clean-energy sources, natural gas, clean coal, and nuclear power. The UAE set a significant investment of \$54 billion in renewable energy to reach net zero by 2050. Dubai's renewable-energy expansion includes extensive solar initiatives such as Mohammed bin Rashid Al Maktoum Solar Park. Approximately [14 percent](#) of its electricity comes from clean sources, and it aims to reach 25 percent by 2030. The forthcoming COP28 Conference in Dubai is expected to bring together key stakeholders, facilitating discussions and actions aimed at enhancing sustainability efforts in the region. Although Saudi Arabia has a limited presence in renewable resources, it is in the process of constructing the world's largest solar facility, with an expected completion date in 2025, and aims for 50 percent of electricity to be sourced from renewables by 2030. In the UAE, transportation was the third-largest source of emissions, contributing to approximately 19 percent of the total. In Saudi Arabia, [transportation](#) was the second-

largest source, responsible for 26 percent of emissions, while it ranked third in Qatar, making up 13 percent of emissions. In all three countries, electricity and heat remained the leading sectors of emissions.

As Turkey advances toward its emission-reduction targets and embraces cleaner transportation alternatives, the synergy between electric mobility and renewable energy will undoubtedly play a crucial role in shaping its sustainable future. Almost 95 percent of its transportation emissions come from road transportation—mainly diesel-powered vehicles. Similarly, in GCC countries, road transportation has produced a significant amount of transportation emissions—more than 90 percent on average—revealing the potential for improvement as alternative powertrain technologies evolve.

Adoption of alternative powertrain vehicles/ electric vehicles

Turkey has been quickly adopting EVs despite global supply-chain issues that stem mainly from chip shortages, wire-harness supplies halted due to the Ukraine-Russia conflict, steep inflation that impacted vehicle prices, and interest rates that went beyond 40 percent for vehicle credit/loans as of 2023. Year-over-year [growth in adoption](#) of plug-in hybrid and electric-battery light vehicles was around 188 percent in 2022 and was expected to grow further in 2023. New models enter the market each year, including locally produced TOGG EVs that became commercially available in 2023. This shows a dedicated localization of lower-emission transportation, as Turkey is imposing an import tax of around 40 percent on imported vehicles and protects competition within the local market.

Turkey is encouraging the adoption of EVs by offering reduced special consumption tax (SCT) between 10 to 60 percent, in contrast to the typically high SCT imposed on their internal combustion engine (ICE) counterparts that normally ranges between 45 to 200 percent. The charging infrastructure has been improving consistently, and the number of companies licensed to install and operate [charging stations](#) has increased to 124, with the total number of charging stations having reached 4,221 as of 2023. Alternative powertrain technologies are being explored, with a focus on hydrogen-powered vehicles to attain net-zero emissions. The limited availability of hydrogen-fueling infrastructure poses a challenge for the widespread adoption of hydrogen-powered light vehicles. However, buses operating on fixed routes are considered early adopters of this technology, as they can overcome the infrastructure limitations more effectively. Turkey is also partnering with international vehicle and parts makers, such as Ford and LG Chem, to locally manufacture batteries that will bring in EV technology capability.

GCC countries have initiated the adoption of EVs, beginning with government-driven purchases. Notably, the Dubai government has set a target to make 30 percent of its [government fleet electric](#) by 2030. Dubai has established a new manufacturing hub dedicated to the local production of EVs and is planning to export to Egypt, Tanzania, Senegal, Mali, and Kenya. Presently, just 1 percent of vehicles in the UAE run on batteries, but the country aims for 50 percent of vehicle sales to be EVs by 2050. In 2022, Saudi Arabia imported approximately fourteen thousand EVs due to the absence of local automotive manufacturing. Nevertheless, the country's recently

unveiled Vision 2030 plan seeks to reduce its dependence on oil. Meanwhile, Qatar is actively developing its local EV brand, EcoTranzit, with the goal of EVs constituting 10 percent of total vehicle sales by 2030. As EV adoption is dependent on infrastructure, green-hydrogen production is also being discussed in GCC countries, due to presence of valuable, renewable electricity-deployment potential from natural resources and low-carbon hydrogen from the vast amount of hydrocarbons.

Collaborative projects or partnerships between Turkey and GCC countries

Both Turkey and the GCC are committed to achieving significant reductions in emissions, which will have a profound impact on their economies. Collaboration between these regions will accelerate the transition toward an improved quality of life for their residents. This transition will necessitate substantial investments and the reallocation of resources from various sources, including public, private, and international funds. Key areas of focus for this collaboration include renewable-energy production and the adoption of EVs.

One noteworthy synergy between EVs and renewable energy is energy storage. The efficient utilization of installed solar and wind facilities can play a pivotal role in facilitating a broader adoption of energy from renewable resources. Turkey, for instance, has recently made energy storage a requirement for licensing solar and wind-energy production applications. However, due to limited financial incentives and rising costs, some companies interested in transitioning have postponed their installation plans. The demand for these licenses is exceptionally high, and

numerous local companies are already manufacturing energy-storage systems ready to serve various sectors, including residential, commercial, and utility-scale applications. The GCC nations have the opportunity to maximize their investments by leveraging the growing expertise in Turkey. They can contribute to the advancement of Turkey's energy system and play a pivotal role in enhancing the integration of EVs into the electricity grid. Furthermore, Turkey has long held substantial potential in the production and advancement of solar panels, and currently ranks fourth globally in solar-panel production capacity.

Carbon capture is another domain in which Turkey can gain valuable insights and technology from GCC countries, given the extensive industrial applications already in place. Turkey's heavy industries constitute the second-largest source of carbon emissions, making carbon-capture technologies particularly relevant. The emerging clean-hydrogen industry in Turkey can benefit from the GCC countries' abundant hydrogen resources and their applications of carbon capture in making hydrogen cleaner, facilitating a faster adoption of this technology.

Recent meetings between the leaders of Turkey and the GCC countries have resulted in agreements to collaborate in various renewable-energy sectors, including wind turbines and solar panels, with an estimated direct investment of [approximately \\$30 billion](#) from GCC countries. Furthermore, collaboration in areas such as carbon capture and energy-storage systems is on the agenda, marking a promising step toward a more sustainable and environmentally friendly future for both regions.

Conclusion

The commitment of both Turkey and the GCC countries to reduce emissions and embrace sustainable energy solutions is commendable. Their joint efforts in renewable energy, EV adoption, and knowledge sharing hold the promise of a more environmentally friendly and economically robust future. Recent agreements between these regions, coupled with a focus on carbon capture and hydrogen technology, underscore the collaborative approach to addressing climate change and advancing clean-energy practices. Through these partnerships and individual initiatives, they are on a path to achieving their ambitious environmental goals while promoting a more sustainable and prosperous future for their residents.





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