

# **The Changing Nature of the Natural Gas Trade between Russia and Turkey: The Role of Climate Change and the EU Institutions**

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## **Abstract**

This article focuses on the changing nature of Russia-Turkey energy trade relations. The main argument of the article is that climate change, as well as EU institutions and environmental protection regulations, have been decisive in the long-term transformation of bilateral natural gas relations. The EU favors competitive market structures to combat climate change, and the EU Green Deal sets ambitious targets for renewable energy consumption. These variables establish grounds for legitimacy among EU members in the face of Russian dominance of the EU energy market. However, as discussed in this paper, the Russian government's main strategy to counter this opposition from the EU side is to circumvent the EU's institutional arrangements through its relations with Turkey. The final point to be discussed in this paper is the impact of the EU energy and environment policies on changes in Russian perceptions of Turkey.

**Keywords:** environment; energy; Green Deal; European Union; international trade

## **Introduction**

The Russian invasion of Ukraine that started in February 2022 has cost thousands of lives and put Europe in late 2022 into an energy crisis, which forced Europeans to reduce their energy consumption and seek alternatives to Russian imports. Like other crises in the past, the Ukraine war affected Turkey-Russia natural gas relations, as discussed extensively in the literature. As this paper aims to show, regional political disputes fall short of explaining the long-term trend of changes in Turkey-Russia energy relations. In the long term, this transformation in the nature of bilateral energy relations is directly and indirectly driven by climate change and the European Union's (EU) institutional and legal responses to it, as well as Russia's changing perceptions since the early 2000s of Turkey as an energy partner.

The paper contributes to the existing knowledge on the impacts of climate change on the commodities trade,<sup>1</sup> by operationalizing issue-linkages in environmental problems and policies,<sup>2</sup> and also, to the literature on the “de-Europeanization of Turkey” from an energy perspective. The data in this article are drawn from official reports and databases: the monthly natural gas reports published by the Energy Market Regulatory Authority of Turkey (*Enerji Piyasası Düzenleme Kurumu*, EMRA) from 2014 to 2022; the monthly electricity production-consumption reports by the Turkish Electricity Transmission Company (*Türkiye Elektrik İletim A.Ş.*, TEİAŞ) in the period 2006-2022; and the ENTSO-E electricity transmission indicators in the period of 2015-2023 are the primary data sources used.

### **The Conceptual Framework**

Studies on the climate change-trade-energy nexus<sup>3</sup> mostly focus on global warming, triggered by energy-intensive production and transportation processes.<sup>4</sup> Either from the standpoint of the EU or Turkey, the existing studies and scenario analyses have scrutinized the issue of bilateral natural gas trade relations thus far within the framework of energy security, diplomacy, energy dependency,<sup>5</sup> the economy,<sup>6</sup> or the environment.<sup>7</sup> While the literature on how international

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<sup>1</sup> Magnus Benzie, et al., “Cross-Border Climate Change Impacts: Implications for the European Union”, *Regional Environmental Change*, Vol. 19, No 3, 2019, p. 763–776; Christopher D. West et al., “Europe’s Cross-Border Trade, Human Security and Financial Connections: A Climate Risk Perspective”, *Climate Risk Management*, Vol. 34, 2021, article 100382; Kevin Adams et al., “Climate-Resilient Trade and Production: The Transboundary Effects of Climate Change and Their Implications for EU Member States”, *Adaptation Without Borders*, 20 August 2020, <https://adaptationwithoutborders.org/knowledge-base/transnational-climate-impacts/climate-resilient-trade-and-production> (Accessed 23 May 2022).

<sup>2</sup> Norman Myers, “The Question of Linkages in Environment and Development”, *BioScience*, Vol. 43, No 5, 1993, p. 302–310; Hugh Ward, “International Linkages and Environmental Sustainability: The Effectiveness of the Regime Network”, *Journal of Peace Research*, Vol. 43, No 2, 2006, p. 149–166.

<sup>3</sup> Joachim Monkelbaan, “Addressing the Trade-Climate Change-Energy Nexus: China’s Explorations in a Global Governance Landscape”, *Advances in Climate Change Research*, Vol. 5, No 4, 2014, p. 206–218.

<sup>4</sup> Michael Jakob, “Globalization and Climate Change: State of Knowledge, Emerging Issues, and Policy Implications”, *WIREs Climate Change*, 20 March 2022 ; Birgit Bednar-Friedl et al., “Adaptation to Transboundary Climate Risks in Trade: Investigating Actors and Strategies for an Emerging Challenge”, *WIREs Climate Change*, Vol. 13, No 2, 2022.

<sup>5</sup> Nona Mikhelidze et al., *The Moscow-Ankara Energy Axis and the Future of EU-Turkey Relations*, FEUTURE Online Paper 5, 2017; Zeyno Baran, “EU Energy Security: Time to End Russian Leverage”, *The Washington Quarterly*, Vol. 30, No 4, 2007, p. 131–144.

<sup>6</sup> Stanley Ngene et al., “Environmental and Economic Impacts of Crude Oil and Natural Gas Production in Developing Countries”, *International Journal of Economy, Energy and Environment*, Vol. 1, No 3, 2016, p. 64–73.

<sup>7</sup> Christopher W. Moore et al., “Air Impacts of Increased Natural Gas Acquisition, Processing, and Use: A Critical Review”, *Environmental Science & Technology*, Vol. 48, No 15, 2014, p. 8349–8359.

trade directly or indirectly impacts the environment is quite comprehensive,<sup>8</sup> the current state of the art writing focuses less on the effects of climate change on trade.<sup>9</sup>

As discussed further in this article, climate change, directly and indirectly, impacts the international trading of energy, and Turkey-Russia relations are no exception.<sup>10</sup> The EU enacts and implements rules and regulations to mitigate climate change, and these regulations affect the member states and their neighbors.<sup>11</sup> As this paper argues, the rules, institutions, and regulations of the EU have direct and indirect implications for the Turkey-Russia natural gas trade through spillover effects<sup>12</sup> by influencing the terms of the natural gas and electricity trade.

Often, the climate change policies of countries are in conflict with their trade policies.<sup>13</sup> International organizations, as well as customs unions, such as the EU, usually support the free movement of goods and services, but environmental policies restrain the cross-border trade of certain goods, which are not environment-friendly, and cause environmental damage. However, it is no coincidence that in the case of EU-Russia-Turkey hydrocarbon trade relations, these policies are not at odds but in *harmony*.<sup>14</sup> In parallel, the new EU trade strategy reviewed in the 2020s emphasizes the importance of the impacts of risks such as climate change beyond the borders of the EU.<sup>15</sup>

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<sup>8</sup> *Trade and Climate Change: A Report by the United Nations Environment Programme and the World Trade Organization*, Geneva, World Trade Organization; United Nations Environment Programme, 2009.

<sup>9</sup> Michael Jakob, “Globalization and Climate Change: State of Knowledge, Emerging Issues, and Policy Implications”, *WIREs Climate Change*, 20 March 2022; Sarah E. Anderson et al., “The Critical Role of Markets in Climate Change Adaptation”, Working Paper Series (National Bureau of Economic Research, May 2018); West et al., “Europe’s Cross-Border Trade, Human Security and Financial Connections”.

<sup>10</sup> Hiroki Wakamatsu and Kentaka Aruga, “The Impact of the Shale Gas Revolution on the U.S. and Japanese Natural Gas Markets”, *Energy Policy*, Vol. 62, 2013, p. 1002–1009.

<sup>11</sup> EU, “Communication from the Commission to the European Council and the European Parliament of 10 January 2007, ‘An Energy Policy for Europe’”, Communication, Brussels, European Commission, 2007, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM%3A127067> (Accessed 23 May 2022). See also: Ali Tekin and Paul Andrew Williams, *Geo-Politics of the Euro-Asia Energy Nexus*, London, Palgrave Macmillan UK, 2011; Zeyno Baran, “EU Energy Security: Time to End Russian Leverage”, *The Washington Quarterly*, Vol. 30, No 4, 2007, p. 131–144. For a critical analysis on the relationship between low-carbon energy transition in Turkey and the EU Green Deal from a political geography perspective, see: Emel Akçalı, Evrim Görmüş, and Soli Özel, “Turkey’s Green Imagination: The Spatiality of the Low-Carbon Energy Transition within the EU Green Deal”, *Uluslararası İlişkiler*, Vol. 20, No 77, 2023, pp. 127-146.

<sup>12</sup> Jan McDonald and Phillipa C. McCormack, “Rethinking the Role of Law in Adapting to Climate Change”, *WIREs Climate Change*, Vol. 12, No 5, September 2021; Jonas J. Schoenefeld et. al., “The Diffusion of Climate Change Adaptation Policy”, *WIREs Climate Change*, Vol. 13, No 3, May/June 2022.

<sup>13</sup> Rafael Leal-Arcas, “Linking International Trade to Climate Change and Energy”, Rafael Leal-Arcas (ed.) *Solutions for Sustainability*, Cham, Springer International Publishing, 2019, p. 48.

<sup>14</sup> Kevin Adams et al., “Climate-Resilient Trade and Production”, p. 7.

<sup>15</sup> Kevin Adams et al., “Climate-Resilient Trade and Production”; European Commission, “Europe Is Ready for Climate Impacts: Commission Evaluates Its Strategy”, 12 November 2018, [https://ec.europa.eu/clima/news-your-voice/news/europe-ready-climate-impacts-commission-evaluates-its-strategy-2018-11-12\\_en](https://ec.europa.eu/clima/news-your-voice/news/europe-ready-climate-impacts-commission-evaluates-its-strategy-2018-11-12_en) (Accessed 23 May 2022); Magnus Benzie et al., “Implications for the EU of Cross-Border Climate Change Impacts”, Project Final Report, March 2017, [www.impressions-project.eu/getatt.php?filename=D3A.2\\_Indirect\\_Impacts\\_FINAL\\_14206.pdf](http://www.impressions-project.eu/getatt.php?filename=D3A.2_Indirect_Impacts_FINAL_14206.pdf) (Accessed 23 May 2022).

It is widely discussed in the literature that since the mid-2010s, Turkey has altered its policy from Europeanization to de-Europeanization<sup>16</sup> due to the high level of securitization of domestic politics. On the other hand, the energy trade relations of Turkey with the EU and Russia have remained almost untouched and Turkey's energy sector has remained integrated both with the EU and Russia despite the crises and discursive de-Europeanization in Turkish domestic politics.<sup>17</sup> In other words, there is a low level of correlation between the diplomatic and energy trade relations of Turkey with both the EU and Russia.

The following sections focus on the factors that influence this deviation, which, at the same time, establish the patterns of long-term transformation in Turkey-Russia natural gas relations. In this context, the second section deals with the effects of EU institutions and regulations attempts to mitigate climate change on Turkey-Russia energy relations, while the third section focuses on the effects of these institutions and regulations on changes in Russia's perceptions of Turkey.

### **The Patterns of Change in Turkey-Russia Natural Gas Relations**

For its hydrocarbon supplies, Turkey is almost entirely dependent on imports. As for natural gas, the main supplier of Turkey has been Russia via pipelines since the 1980s. Throughout history, Russian natural gas supplies to Turkey have never ceased, despite bilateral and regional crises.<sup>18</sup> Very basically, natural gas supplies go along three main tracks in the Turkish economy. The first is consumption by households and businesses. The second is exports toward the EU via pipelines, or storage in domestic underground storage facilities and/or liquefied natural gas (LNG) terminals. LNG terminals and storage facilities in Turkey are new and strategic investments to process imported LNG. The third channel is the conversion sector. An important factor to consider here is that, in the long term, consumption by households and industry have increased, while relative demand by the conversion sector has decreased (Figure 1).

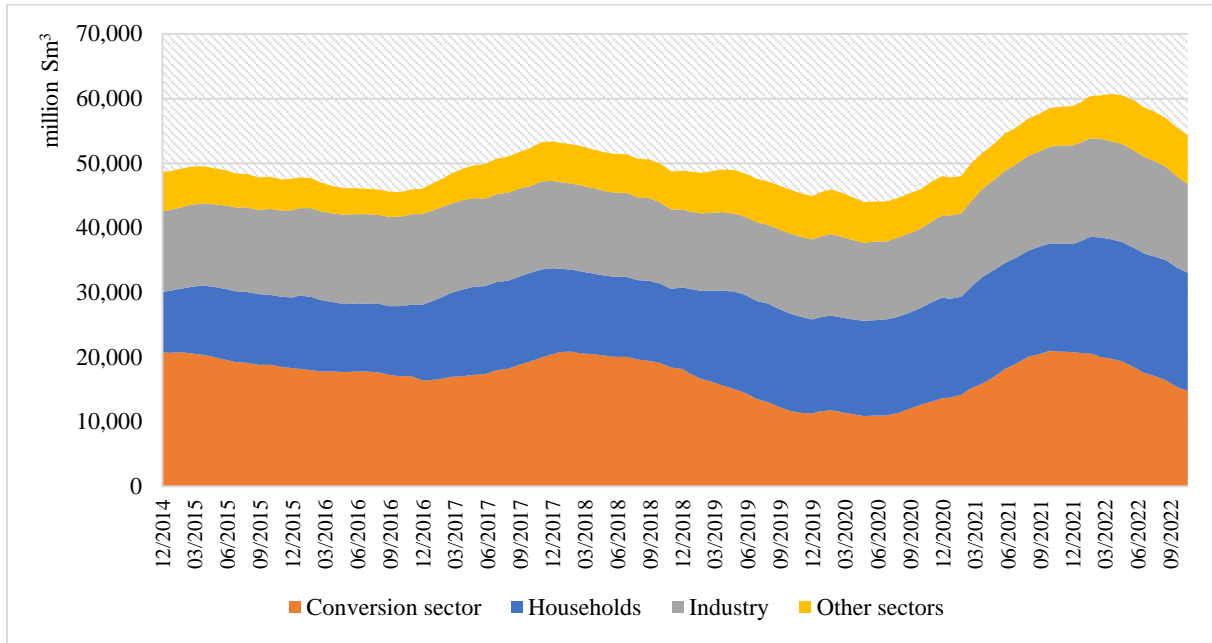
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<sup>16</sup> Gözde Yılmaz, "From Europeanization to De-Europeanization: The Europeanization Process of Turkey in 1999–2014", *Journal of Contemporary European Studies*, Vol. 24, No 1, 2016, p. 86–100; Başak Alpan and Ahmet Erdi Öztürk, "Turkish Foreign Policy in the Balkans amidst 'Soft Power' and 'de-Europeanisation'", *Southeast European and Black Sea Studies*, Vol. 22, No 1, 2022, p. 45–63; Senem Aydın-Düzgit and Alper Kaliber, "Encounters with Europe in an Era of Domestic and International Turmoil: Is Turkey a De-Europeanising Candidate Country?", *South European Society and Politics*, Vol. 21, No 1, 2016, p. 1–14.

<sup>17</sup> Kadri Tastan, "The Challenge of Decarbonisation and EU-Turkey Trade Relations: A Long-Term Perspective", *SWP Comment*, 2022 (Accessed 06 February 2023).

<sup>18</sup> Hasan Ali Karasar, "Türkiye-Rusya İlişkilerine Genel Bir Bakış", Halil Burak Sakal (ed.), *Türkiye-Rusya İlişkilerinde Enerji*, Nevşehir, Cappadocia University Press, 2019, p. 11–16.

**Figure 1.** Turkey’s Natural Gas Consumption by Sectors, 12-months Cumulative, Moving



**Source:** Author, based on data provided by EMRA. Latest data: November 2022.<sup>19</sup>

The following two sub-sections explore the two main trends of changes in Turkey-Russia energy relations, which were directly or indirectly impacted by the EU institutions and climate change policies.

### *The Impacts of the EU Climate Change Policies*

The first change is explained by the long-term decline in demand by the Turkish conversion sector. The EU’s environmental policies, as well as its relations and political stance toward its close neighborhood, are decisive here. The spillover impacts of the EU Green Deal that aims to reach climate neutrality by 2050 affect the natural gas trade relationship between Turkey and Russia.

In harmony with the “Fit for 55” package, the EU has long been revising its energy, environment, and transport legislation. The package calls for EU members to cut net emissions by at least 55% by 2030.<sup>20</sup> This target was turned into a legal obligation for the EU member states under the European Climate Law. In parallel, to reduce greenhouse gas emissions, the

<sup>19</sup> EMRA, “Doğal Gaz Piyasası Aylık Sektör Raporu Listesi [Natural Gas Market Monthly Sector Reports]”, T.C. Enerji Piyasası Düzenleme Kurumu (Energy Market Regulatory Authority of the Republic of Turkey), data based on all available reports from January 2014 to November 2022, <https://www.epdk.gov.tr/Detay/Icerik/3-0-95-1007/dogal-gazaylik-sektor-raporu> (Accessed 04 February 2023).

<sup>20</sup> European Commission, “European Climate Law”, Official website, European Climate Law, [https://ec.europa.eu/clima/eu-action/european-green-deal/european-climate-law\\_en](https://ec.europa.eu/clima/eu-action/european-green-deal/european-climate-law_en) (Accessed 23 May 2022).

EU's main strategy of decarbonization is through supporting renewable energy consumption. A part of this strategy is the "Carbon Border Adjustment Mechanism (CBAM)" which forces the trade partners of the EU to reduce the carbon intensity of their exports to the EU, to avoid financial burdens.<sup>21</sup>

The government of Turkey revised its development strategies and energy action plans to fit in with EU climate change regulations. In 2014, the government published the "Renewable Energy Action Plan", which aims to address the 2009/28/EC Directive on the promotion of renewable energy.<sup>22</sup> In 2021, to adopt the changes led by the EU Green Deal, the government prepared another roadmap with the title of the "Green Deal Action Plan".<sup>23</sup> Through these plans, Turkey rapidly adopted its energy policies in harmony with the EU's policy responses to climate change.

To promote renewable energy, in 2019, the EU legislated to give priority dispatch rights to the "[e]lectricity from renewable sources."<sup>24</sup> In addition, the EU upped its renewable energy consumption target for 2030 to 40 percent.<sup>25</sup> To address the EU's environmental policy changes, Turkey has undergone a significant change in the structure of its electricity sector since the early 2000s: The Electricity Market Law was amended, which commits the government to support new renewable power plant installments by the private sector with a mechanism known as the Support Mechanism of Renewable Energy Resources (*Elektrik Piyasası Yenilenebilir Enerji Kaynakları Destekleme Mekanizması*, YEKDEM).<sup>26</sup> Through this mechanism, the private sector, instead of the public sector, became the main actors in the renewable energy trade with the EU, enabled by the infrastructure prepared by TEİAŞ by

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<sup>21</sup> Sevil Acar, Ahmet Atıl Aşıcı, and A. Erinç Yeldan, "Potential Effects of the EU's Carbon Border Adjustment Mechanism on the Turkish Economy", *Environment, Development and Sustainability*, Vol. 24, No 6, 2022, p. 8162–8194; Tastan, "The Challenge of Decarbonisation and EU-Turkey Trade Relations".

<sup>22</sup> Republic of Turkey Ministry of Energy and Natural Resources, "Türkiye Ulusal Yenilenebilir Enerji Eylem Planı", Ankara, 2014, <https://www.ebrd.com/documents/admin/trkiye-ulusal-yenleneblr-enerji-eylem-planı.pdf> (Accessed 03 February 2023).

<sup>23</sup> Republic of Turkey Ministry of Trade, "Yeşil Mutabakat Eylem Planı" [Green Deal Action Plan], Ankara, 2021, <https://ticaret.gov.tr/data/60f1200013b876eb28421b23/MUTABAKAT%20YE%C5%9E%C4%B0L.pdf> (Accessed 03 February 2023).

<sup>24</sup> EU, "Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the Internal Market for Electricity", <http://data.europa.eu/eli/reg/2019/943/oj/eng> (Accessed 23 May 2022).

<sup>25</sup> European Council, "Clean Energy", Official website, Fuelling the Transition to a Decarbonised Economy, April 2022, <https://www.consilium.europa.eu/en/policies/clean-energy/> (Accessed 23 May 2022).

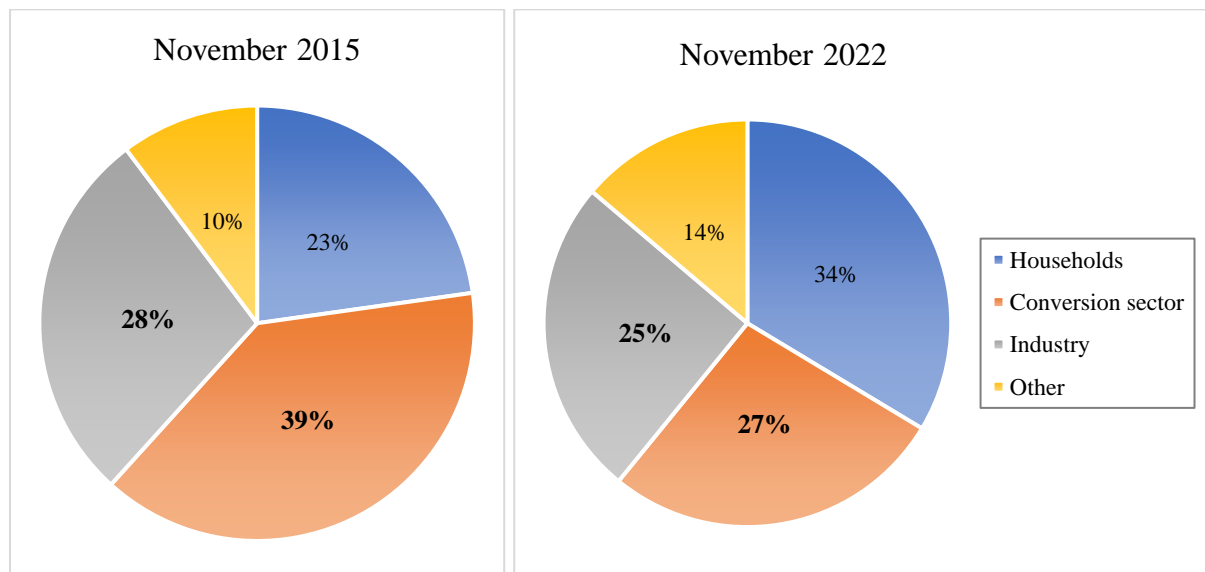
<sup>26</sup> TBMM, "Enerji Piyasası Düzenleme Kurumunun Teşkilat ve Görevleri Hakkında Kanun", Pub. L. No. 4628, § 5, Resmi Gazete, 2001, <https://www.mevzuat.gov.tr/MevzuatMetin/1.5.4628.pdf>; T.C. Cumhurbaşkanlığı Mevzuat Bilgi Sistemi, "Yenilenebilir Enerji Kaynaklarının Belgelendirilmesi Ve Desteklenmesine İlişkin Yönetmelik", 28782 § 2013, <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=18907&MevzuatTur=7&MevzuatTertip=5>.

getting involved in the ENTSO-E network, which will be discussed in some detail in the following sub-section.

To avoid loss of competitiveness and financial burdens because of the Carbon Border Adjustment Mechanism, Turkish industrial exports to the EU must be less carbon intense. Significant changes occurred in Turkey’s energy sector structure, as the “Law on the Use of Renewable Energy Sources in Electricity Generation” entered into force in 2005<sup>27</sup> and was amended in 2011.<sup>28</sup> These new regulations from Turkey aimed at ensuring competitive electricity prices for Turkish companies operating in the EU market, and increasing the export of renewable electricity to the EU.<sup>29</sup>

Consequently, these new regulations had an impact on Turkey-Russia natural gas relations. Increased renewable energy generation, accompanied by the demand by the EU member states for renewable energy, reduced the demand for natural gas in electricity generation in Turkey.

**Figure 2.** Share of Sectors’ Natural Gas Demand in Turkey



**Source:** Author, based on data provided by EMRA. Latest data: November 2022.<sup>30</sup>

<sup>27</sup> TBMM, “Yenilenebilir Enerji Kaynaklarının Elektrik Enerjisi Üretimi Amaçlı Kullanımına İlişkin Kanun”, 2005, <https://www.resmigazete.gov.tr/eskiler/2005/05/20050518-1.htm> (Accessed 23 May 2022).

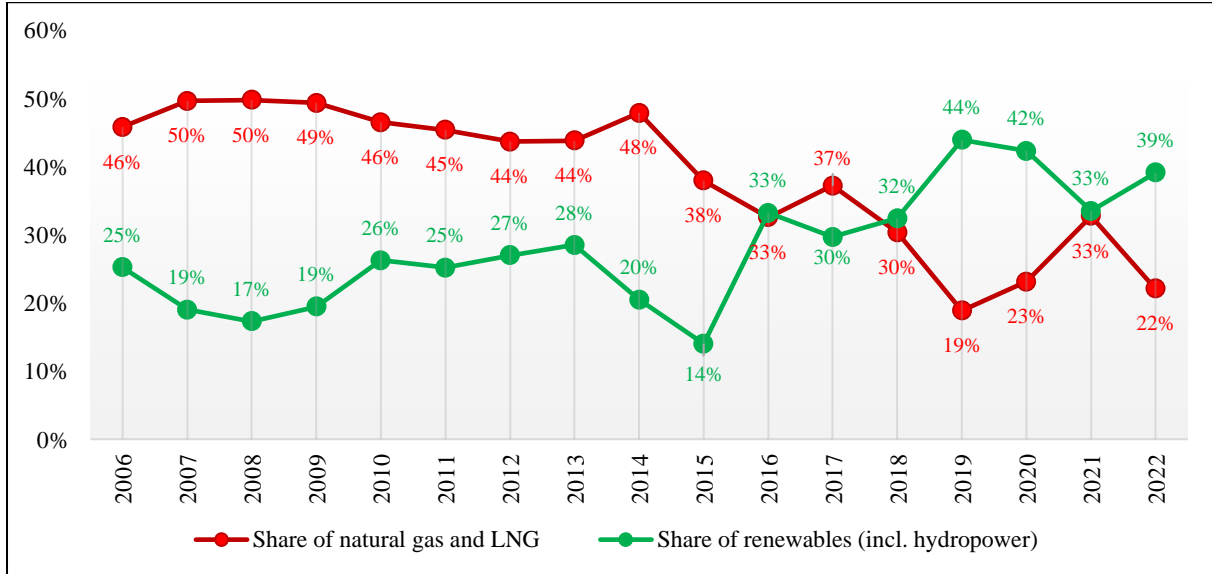
<sup>28</sup> TBMM, “Yenilenebilir Enerji Kaynaklarının Elektrik Enerjisi Üretimi Amaçlı Kullanımına İlişkin Kanunda Değişiklik Yapılmasına Dair Kanun”, 2011, <https://www.resmigazete.gov.tr/eskiler/2011/01/20110108-3.htm> (Accessed 23 May 2022).

<sup>29</sup> Luigi Carafa, “Domestically Driven, Differentiated EU Rule Adoption: The Case of Energy Sector Reform in Turkey”, Francesco Morata and Israel Solorio Sandoval (eds.), *European Energy Policy: An Environmental Approach*, Cheltenham, Northampton, MA, Edward Elgar, 2012, p. 171–192.

<sup>30</sup> EMRA, Natural Gas Market Monthly Sector Reports. Data based on all available reports from January 2014 to November 2022. Latest observation: 5 February 2023.

To recapitulate, Figures 1 and 2 indicate that the share of the conversion sector and industry in natural gas demand decreased as of end-2022 in the face of an increase in total natural gas demand in Turkey.

**Figure 3.** Shares of Natural Gas and Renewables in Gross Electricity Generation in Turkey



Source: Author, based on data provided by TEİAŞ.<sup>31</sup>

Another point to note here is that, as shown in Figure 3, the natural gas-fired power plant share in Turkey’s total electricity generation, which stood at a high of 46 percent between 2006 and 2015, on average, fell to 28 percent average, between 2016 and 2022. Turkey’s energy policy shift toward renewables, in parallel with EU environmental policies, was the main driving force of this change.<sup>32</sup>

### *The impacts of the EU energy market mechanism*

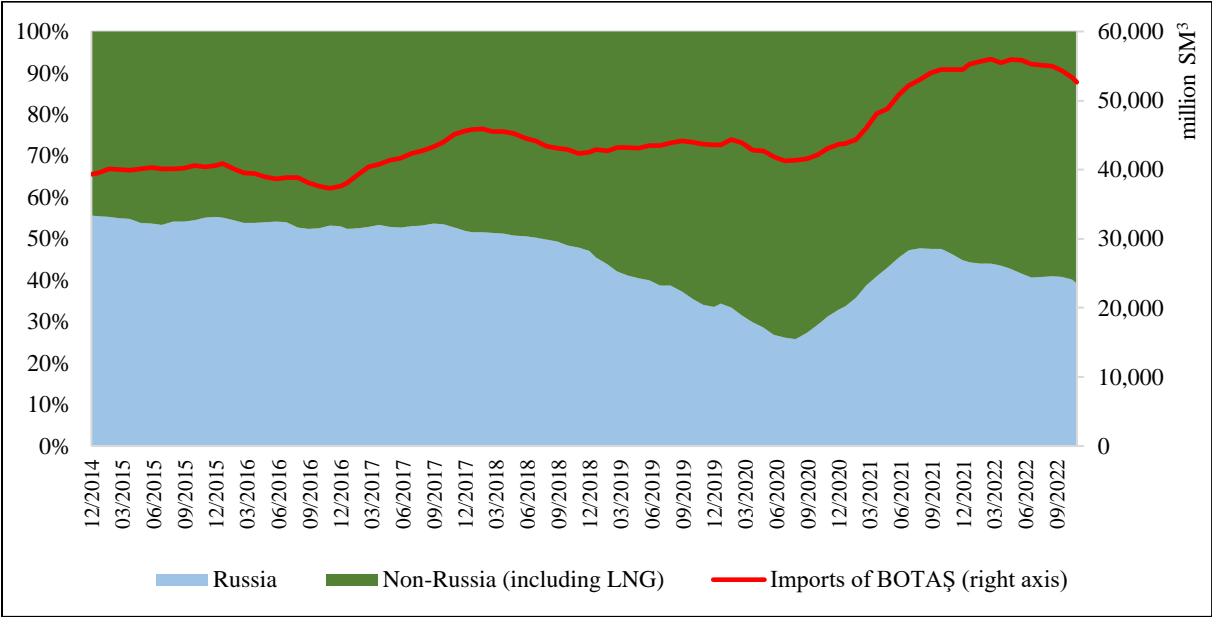
The second change to be discussed under this sub-section explains the decrease in the share of natural gas imported from Russia by Turkey. As of November 2022, the share of Russian gas in Turkey’s total natural gas imports decreased to 39.2 percent. While the average share from Russia in Turkey’s total natural gas imports was at an average of 52.7 percent between 2014 and 2018, the average has shrunk to 38.5 since 2018 (Figure 4). One of the main drivers of this change was that, as the data show, Turkey has begun replacing Russia with other natural gas suppliers in the last two decades, including overseas LNG.

<sup>31</sup> TEİAŞ, “Aylık Elektrik Üretim-Tüketim Raporları [Monthly Electricity Generation-Consumption Reports]”, Ankara, Türkiye Elektrik İletim Anonim Şirketi, 2022, <https://www.teias.gov.tr/tr-TR/aylik-elektrik-uretim-tuketim-raporlari> (Accessed 04 February 2023).

<sup>32</sup> Republic of Turkey Ministry of Trade, “Yeşil Mutabakat Eylem Planı” [Green Deal Action Plan].

Here, EU regulations have played a more indirect role. The transformation in Turkey’s energy market structure to adopt EU regulations has been the main driver of this change. As private sector engagement in the natural gas sector has increased in Turkey due to the regulatory amendments, the number of licensed buyers of natural gas has increased. The private sector companies now have the alternative of purchasing LNG, whose price tends to be more competitive and flexible.<sup>33</sup>

**Figure 4.** Share of Russia and Other Countries in Turkey’s Natural Gas Imports, 12-months Cumulative, Moving



**Source:** Author, based on data provided by EMRA. Latest data: November 2022.<sup>34</sup>

The role of the market mechanism in mitigating climate change impacts is a widely discussed issue among policymakers and academics.<sup>35</sup> Prioritizing liberal market mechanisms, in particular competition among private sector firms that adhere to the rules and principles set by national or supra-national regulating authorities (such as the EU Agency for the Cooperation

<sup>33</sup> International Trade Administration, “Turkey - Oil and Gas Equipment – LNG and LNG Terminals, Upstream, Downstream and Midstream”, Official website, Turkey - Country Commercial Guide, 7 December 2021, <https://www.trade.gov/knowledge-product/turkey-oil-and-gas-equipment-lng-and-lng-terminals-upstream-downstream> (Accessed 23 May 2022).

<sup>34</sup> EMRA, Natural Gas Market Monthly Sector Reports. Data based on all available reports from January 2014 to November 2022. Latest observation: 5 February 2023.

<sup>35</sup> Anderson et al., “The Critical Role of Markets in Climate Change Adaptation”; Gordon Bennett, “The Role of Markets in the Energy Transition”, The ICE (Intercontinental Exchange, Inc), September 2020, <https://www.theice.com/insights/market-pulse/the-role-of-markets-in-the-energy-transition> (Accessed 23 May 2022).

of Energy Regulators<sup>36</sup>, founded in June 2019), the EU, as a common market and an integrated economic zone, champions a reduced role for the public sector in energy production, transmission, and distribution processes. The unbundling of energy generation and supply from transmission networks was the basis of the EU's Third Energy Package of 2009<sup>37</sup> and is indicated clearly in the EU Energy Union strategy adopted in 2015.<sup>38</sup>

The Energy Union strategy aims for the EU to speak with one voice with other countries in terms of energy, and to maintain a single and competitive energy market in which energy flows freely across borders. The goal of reaching a sustainable, low-carbon, and climate-friendly economy is directly related to this strategy.<sup>39</sup> In parallel, the EU regulations determine that state-run energy companies that have trade relations with the EU must be privatized. As a reflection of this principle, the EU aimed at enlarging the size and enhancing the competitiveness<sup>40</sup> of the electricity market, by integrating energy systems (including electricity networks) throughout the EU and its neighbors.<sup>41</sup> To reach this aim, the EU developed the trans-European networks for energy (TEN-E) for connecting the European energy systems and its neighbors, including Turkey.

The open market policies of the EU have implications for the electricity and natural gas sector in Turkey. As for the electricity sector, since the early 2010s, Turkey's electricity network is interconnected with Europe through the ENTSO-E system.<sup>42</sup> Turkey's integration into the ENTSO-E is a direct result of Turkey's EU accession process.<sup>43</sup> On the other hand, the

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<sup>36</sup> EU, "Regulation (EU) 2019/942 of the European Parliament and of the Council of 5 June 2019 Establishing a European Union Agency for the Cooperation of Energy Regulators (Text with EEA Relevance.)", 2019, <http://data.europa.eu/eli/reg/2019/942/oj/eng> (Accessed 23 May 2022).

<sup>37</sup> European Commission, "Third Energy Package", 2022, [https://energy.ec.europa.eu/topics/markets-and-consumers/market-legislation/third-energy-package\\_en](https://energy.ec.europa.eu/topics/markets-and-consumers/market-legislation/third-energy-package_en) (Accessed 23 May 2022).

<sup>38</sup> "A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy", Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, 2015, <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex:52015DC0080> (Accessed 23 May 2022).

<sup>39</sup> Republic of Turkey Ministry of Foreign Affairs, Directorate for EU Affairs, "Chapter 15 - Energy", 22 May 2020, [https://www.ab.gov.tr/chapter-15-energy\\_80\\_en.html](https://www.ab.gov.tr/chapter-15-energy_80_en.html) (Accessed 23 May 2022).

<sup>40</sup> European Council, "European Green Deal", Official website, The EU's goal of climate neutrality by 2050, March 2022, <https://www.consilium.europa.eu/en/policies/green-deal/> (Accessed 23 May 2022).

<sup>41</sup> EU, "Communication from the Commission to the European Council and the European Parliament of 10 January 2007, 'An Energy Policy for Europe'".

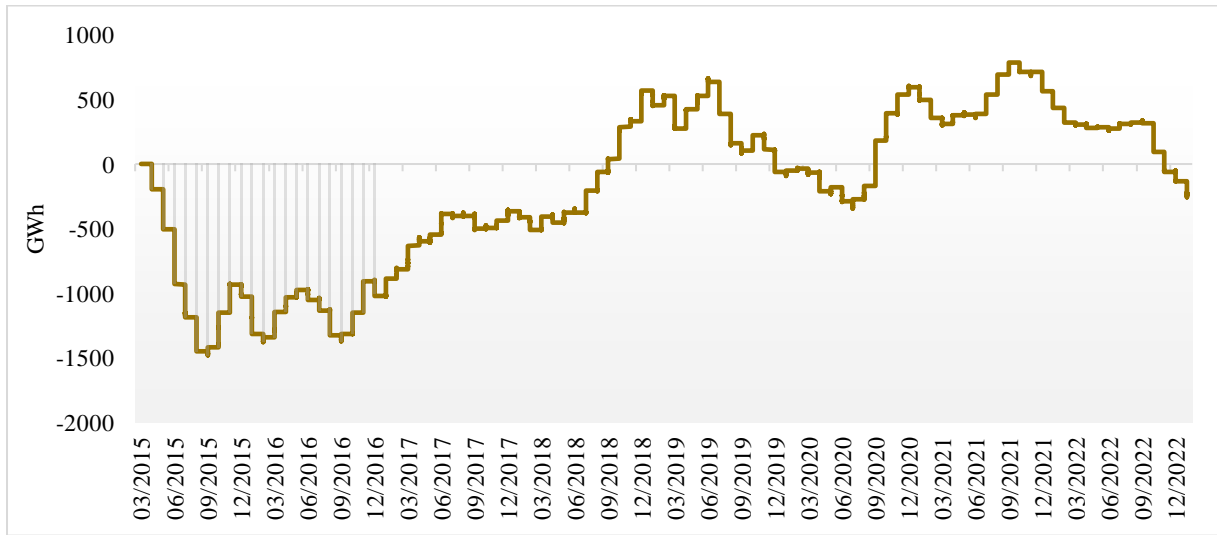
<sup>42</sup> Halil Burak Sakal, "Turkey's Energy Trade Relations with Europe: The Role of Institutions and Energy Market", *Energy & Environment*, Vol. 32, No 7, 2021, p. 1243-1274.

<sup>43</sup> Republic of Turkey Ministry of Foreign Affairs, Directorate for EU Affairs, "Chapter 15 - Energy".

Third Energy Package and the Energy Union strategy restrict Gazprom’s investments in the EU.<sup>44</sup>

For Turkey, the ENTSO-E enabled a stable demand and an integrated market for renewable electricity. As Turkey is an integral part of the EU’s electricity grid after connecting to the ENTSO-E network, private Turkish renewable energy entrepreneurs began to contribute to the EU renewable energy target. As a result, Turkey, a net electricity energy importer until 2017, became a net electricity energy exporter to the EU (Figure 5). This became possible with legal and infrastructural changes in Turkey, to adopt EU regulations and institutions.<sup>45</sup> This, in turn, reduced natural gas demand for electricity production.

**Figure 5.** Net Flows of Electricity from Turkey to Bulgaria and Greece (3 Months Cumulative, Moving)



**Source:** Author, based on data provided by ENTSO-E.<sup>46</sup>

<sup>44</sup> Tom Miles, “Russia Loses Bulk of WTO Challenge to EU Gas Pipeline Rules”, *Reuters*, 10 August 2018, sec. Commodities News, <https://www.reuters.com/article/us-russia-eu-gazprom-wto-idUSKBN1KV10X> (Accessed 23 May 2022); Permanent Mission of the Russian Federation to the European Union, “Report of the WTO Panel on the ‘Third Energy Package,’” Official website, 14 August 2014, <https://russiaeu.ru/en/news/report-wto-panel-third-energy-package> (Accessed 23 May 2022); European Commission, “EU Trade Relations with Russia”, Official website, Russia, [https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/russia\\_en](https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/russia_en) (Accessed 23 May 2022).

<sup>45</sup> T.C. Cumhurbaşkanlığı Mevzuat Bilgi Sistemi, “Elektrik Piyasası İthalat ve İhracat Yönetmeliği”, 2014, <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=19679&MevzuatTur=7&MevzuatTertip=5>; TEİAŞ, “TEİAŞ Kapasite İhale Sistemini Kullanabilen Firmalara Ait Güncel Liste”, TCAT, 9 May 2022, <https://tcat.teias.gov.tr/companies/registered>; Ministry of Foreign Affairs of the Republic of Turkey, “Turkey’s International Energy Strategy”, Official website, <https://www.mfa.gov.tr/turkeys-energy-strategy.en.mfa> (Accessed 13 May 2022).

<sup>46</sup> ENTSO-E, “Cross-Border Physical Flow”, Database, Transparency Platform, 2023, <https://transparency.entsoe.eu/transmission-domain/physicalFlow/show>.

The legal and infrastructural regulations mentioned above are as follows: A system introduced by the EPIAŞ (*Enerji Piyasaları İşletme A.Ş.*, EXIST) made it possible to monitor the real-time renewable electricity generation of each Turkish company.<sup>47</sup> Based on a blockchain technology, the EMRA launched a system, in which all processes of electricity from generation to distribution to the final consumer can be monitored. Through this system, the final consumer can safely be assured that the consumed electricity was generated from a renewable source. In this system known as the “Renewable Energy Source Guarantee System (*Yenilenebilir Enerji Kaynak Garanti Sistemi*, YEK-G),”<sup>48</sup> certificates are issued per MWh of electricity produced from renewable resources.<sup>49</sup> These certificates also allow an energy generator firm in Turkey to trade traceable/source-guaranteed renewable electricity with EU partners. The YEK-G system, prepared in harmony with the EU Guarantees of Origin system, has been in force in Turkey since June 2021.<sup>50</sup>

A similar, private-sector-led development was decisive in the natural gas sector of Turkey. While the state-owned gas company of Turkey, Petroleum Pipeline Corporation (*Boru Hatları ile Petrol Taşıma A.Ş.*, BOTAŞ), remains the biggest importer of natural gas, smaller but “influential” natural gas companies have been allowed to operate in the Turkish market after significant modifications to the domestic natural gas regulations in Turkey since the early 2000s. These modifications are pushed by EU regulations.

Following the EU *acquis*, in 2001, Turkey’s Natural Gas Market Law was amended to liberalize the natural gas market and ensure competition to the benefit of the end consumers. BOTAŞ’s monopoly of natural gas imports came to an end with this law, and the natural gas import contracts of BOTAŞ were gradually transferred to private companies.<sup>51</sup> After BOTAŞ’s contracts expired, Gazprom had to sign new agreements with private Turkish companies, beginning from 2012.<sup>52</sup>

At the beginning of 2022, a new deal was reached with Gazprom: BOTAŞ signed a 4-billion-cubic meter contract, and the private companies signed another 4-billion-cubic meter deal with the Russian monopoly. As BOTAŞ’s monopoly has ended, the private energy firms

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<sup>47</sup> EPIAŞ, “EXIST - Energy Exchange İstanbul”, Şeffaflık Platformu, 2022, <https://seffalik.epias.com.tr/transparency/> (Accessed 23 May 2022).

<sup>48</sup> EPIAŞ, “Epias YEK-G - Yenilenebilir Enerji Kaynak Garanti Sistemi”, EPIAŞ YEK-G, 2021, <https://yekgnedir.com/> (Accessed 23 May 2022).

<sup>49</sup> Republic of Turkey Ministry of Trade, “Yeşil Mutabakat Eylem Planı.”

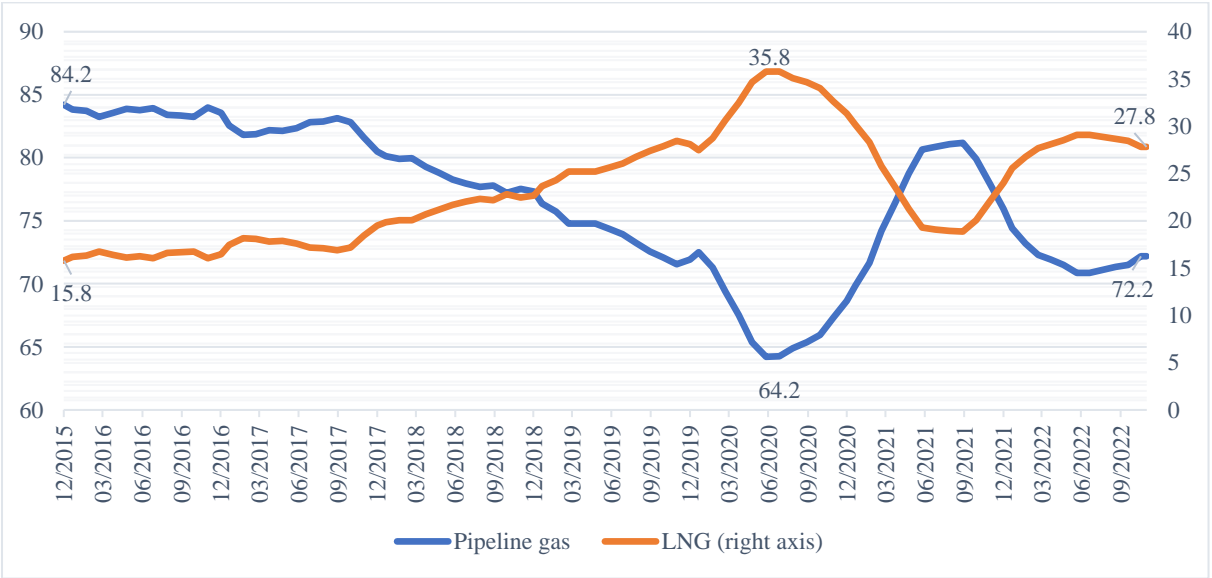
<sup>50</sup> Personal written communication with Deniz Daştan, 9 September 2020.

<sup>51</sup> Bosphorus Gaz, “Profile”, 2020, <https://www.bosphorusgaz.com/sirketimiz-2/profil> (Accessed 23 May 2022).

<sup>52</sup> BOTAŞ, “Sector Report for 2012”, 2012, [https://www.botas.gov.tr/uploads/galeri/15-2019sektorap\\_2012.pdf](https://www.botas.gov.tr/uploads/galeri/15-2019sektorap_2012.pdf) (Accessed 23 May 2022).

close deals individually with Russia’s Gazprom.<sup>53</sup> The Turkish private natural gas companies also sought alternatives to Russian natural gas, and found the alternative of importing lower-cost LNG via tankers from other suppliers like Algeria, Qatar, the US, and Nigeria.<sup>54</sup> As Figure 6 shows, between 2015 and end-2022, the share of pipeline gas in Turkey’s total natural gas imports dropped from 84.2 to 72.2 percent, while the share of the LNG rose to 27.8 percent.

**Figure 6.** Share of Pipeline Gas and LNG in Turkey’s Total Natural Gas Imports (12-months Cumulative, Moving)



**Source:** Author, based on data provided by EMRA.<sup>55</sup> Latest data: November 2022.

This section discussed the main patterns of change in Turkey-Russia natural gas relations, principally induced by the EU’s political and institutional responses to climate change and global warming. The conclusions reached in this section are summarized in Table 1.

**Table 1.** EU Policies and Implications for Turkey-Russia Natural Gas Relations

EU aim/ challenge	EU policy response	Turkey’s policy adaptation	Results in Turkey’s energy sector	Impacts on Turkey-Russia energy ties
Reduce emissions by 55% by 2030	Green Deal and the Fit for 55 Package	Green Deal Roadmap	Increase in renewable energy generation	Less demand by the conversion sector for natural gas

<sup>53</sup> Ece Göksedef, “Doğalgaz sıkıntısı 2022’de Elektrik Kesintilerine Yol Açar Mı?”, *BBC News Türkçe*, 30 December 2021, <https://www.bbc.com/turkce/haberler-turkiye-59821370> (Accessed 23 May 2022).

<sup>54</sup> BP, “Statistical Review of World Energy 2021”, July 2021, 58, <https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html> (Accessed 23 May 2022).

<sup>55</sup> EMRA, Natural Gas Market Monthly Sector Reports. Data is based on all available reports from January 2014 to November 2022. Latest observation: 5 February 2023.

	CBAM	YEKDEM	Less carbon-intense industrial production	
	Renewable energy targets	Renewable Energy Action Plan, YEK-G system	Turkey became net electricity exporter to the EU	
<b>Establish a common and competitive energy market</b>	Only private companies can trade with the EU partners	Privatization of the natural gas sector	Monopoly of BOTAŞ in natural gas sector ended	Private companies prefer LNG instead of pipeline gas
		Integration into the ENTSO-E	Number of private electricity exporters to the EU increased	Russia cannot directly trade with the EU partners

The next section deliberates on how the Russian government circumnavigates and endures this rapid and dramatic process of change by employing its (sometimes conflictual) political and trade ties with Turkey in a mostly cooperative way. As the Russian invasion of Ukraine and the EU's robust reaction to Russia showed clearly, EU-Russia energy relations have always had political ingredients. Now, it is more apparent that the EU's climate change policies can easily become influential political instruments in the context of EU-Russia hydrocarbon trade relations.

### **The Impacts of EU Policies on the Changing Perceptions of Turkey by Russia as an Energy Partner**

Unlike Turkey's privatized natural gas sector, the Russian oil and natural gas sectors are dominated and directed by the public sector.<sup>56</sup> This structure of the Russian energy sector is unlikely to change in the near future. Therefore, to minimize the impacts of the climate-change-led EU regulations on the unbundling of the vertically integrated energy companies, Russia developed a strong partnership with Turkey,<sup>57</sup> particularly with regards to the natural gas pipeline projects.<sup>58</sup> The solid ties of the natural gas trade between Turkey and Russia remain

<sup>56</sup> Adnan Vatansever, *Oil in Putin's Russia: The Contests over Rents and Economic Policy*, Toronto, Buffalo, London, University of Toronto Press, 2021.

<sup>57</sup> Şaban Kardaş, "Liberalization of the Turkish Energy Market Sparks Russian and European Interest", Jamestown Foundation, 25 September 2009, <https://jamestown.org/program/liberalization-of-the-turkish-energy-market-sparks-russian-and-european-interest/> (Accessed 23 May 2022).

<sup>58</sup> Dışişleri Bakanlığı, "Türkiye Cumhuriyeti İle Rusya Federasyonu Arasındaki İlişkilerin Yeni Bir Aşamaya Doğru İlerlemesi Ve Dostluğun Ve Çok Boyutlu Ortaklığın Daha Da Derinleştirilmesine İlişkin Ortak Deklarasyon", T.C. Dışişleri Bakanlığı, 13 February 2009, <https://www.mfa.gov.tr/turkiye-cumhuriyeti-ile-rusya->

largely intact, despite regional and bilateral conflicts. These solid ties were enabled by Russia’s changing perceptions of Turkey as an energy partner since the 2010s.

One of the main indicators of Russia’s changing perceptions of Turkey as an energy partner was the construction of the “TurkStream” pipeline in the 2010s, as an alternative to the controversial South Stream project canceled by the EU in 2014, because it did not comply with the necessary regulations on competition<sup>59</sup> with reference to Article 9 of the EU Natural Gas Directive.<sup>60</sup> In 2019, the European Commission further revised the 2009 Natural Gas Directive, with the aim that “no current, planned and future gas infrastructure project between a member state and a third country distorts the single market for energy.”<sup>61</sup>

**Table 2.** The Nature of Political and Trade Relations of Russia with the EU and Turkey

Peers	Political relations	Energy trade relations
EU-Russia	Conflictual	Conflictual
Turkey-Russia	Conflictual/cooperative	Cooperative

As summarized in Table 2, politics is decisive in EU-Russia energy relations, and although the EU regulations are shaped by concerns about the impacts of climate change, the EU also uses the climate change regulations as political tools against Russia. The recent war in Ukraine and the accompanying discussions on EU dependence on Russian natural gas, as well as the critical policy choice at the end of 2022 not to buy gas from Russia, support this observation. Beginning in the earliest phases of the Russian invasion of Ukraine, the International Energy Agency’s official trade policy documents proposed reducing the volume

federasyonu-arasindaki-iliskilerin-yeni-bir-asamaya-dogru-ilerlemesi-ve-dostlugun-ve-cok-boyutlu.tr.mfa (Accessed 23 May 2022); Fatih Özbay, “The Relations between Turkey and Russia in the 2000s”, *PERCEPTIONS: Journal of International Affairs*, Vol. 16, No 3, 2011, p. 69–92; Rémi Bourgeot, “Russia-Turkey: A Relationship Shaped by Energy”, Paris, Ifri, March 2013, <https://www.ifri.org/sites/default/files/atoms/files/ifriremibourgeotrussiaturkeyengmarch2013.pdf> (Accessed 23 May 2022); Gareth Winrow, “Turkey and Russia: The Importance of Energy Ties”, *Insight Turkey*, Vol. 19, No 1, 2017, pp. 17–32.

<sup>59</sup> Elmar Baghirov, “Turkish Stream Offers Russia Increased Export Control”, *Oil & Gas Journal*, 1 June 2015, <https://www.ogj.com/general-interest/article/17236931/turkish-stream-offers-russia-increased-export-control> (Accessed 23 May 2022).

<sup>60</sup> “Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 Concerning Common Rules for the Internal Market in Natural Gas and Repealing Directive 2003/55/EC”, 2019, <http://data.europa.eu/eli/dir/2009/73/2019-05-23/eng> (Accessed 23 May 2022).

<sup>61</sup> “European Parliament, “Internal Energy Market”, Official website, Fact Sheets on the European Union, October 2021, <https://www.europarl.europa.eu/factsheets/en/sheet/45/internal-energy-market> (Accessed 23 May 2022).

of imported natural gas from Russia.<sup>62</sup> This policy stance supports the EU environment policy that foresees increasing energy imports generated by renewable sources, which means limiting or preventing natural gas trade with Russia. One of the most critical political aims of the EU, as indicated in the Energy Union strategy, is the diversification of energy supply sources and routes. This strategy is closely connected to the Russian aggression in Eastern Europe, which became evident with the Ossetia war in 2008 and the annexation of Crimea in 2014. Therefore, it is not surprising that the Energy Union strategy stressed in 2015 that “[t]he political challenges over the last months have shown that diversification of energy sources, suppliers and routes is crucial for ensuring secure and resilient energy supplies to European citizens and companies, who expect access to affordable and competitively priced energy at any given moment.”<sup>63</sup> These pieces of evidence demonstrate that EU policy against the use of Russian natural gas is a longer-term phenomenon, which peaked with the 2022 invasion of Ukraine.

Another important aspect of the Energy Union is the importance given to LNG instead of natural gas in harmony with the diversification efforts.<sup>64</sup> As acknowledged by the EU, energy is “a foreign policy tool, in particular in major energy producing and transit countries.”<sup>65</sup> With regards to Russia, the strategy indicates that “[w]hen the conditions are right, the EU will consider reframing the energy relationship with Russia based on a level playing field in terms of *market opening, fair competition, environmental protection*, and safety, for the mutual benefit of both sides.<sup>66</sup> Therefore, it can be argued that competition, market mechanisms, and the environment are indispensable parts of EU energy policies in relation to its neighbors, as indicated in official EU strategy documents.

Considering the energy policies of Russia, the EU is an influential veto player that acts against Russian domination in the European energy market.<sup>67</sup> On the other hand, Turkey is not a big veto player and has traditionally developed close relations with Russia in international energy trade and transfer projects since the Soviet era.<sup>68</sup> Since the early 2000s, Russia-Turkey relations have entered a new phase, with Vladimir Putin and Recep Tayyip Erdoğan coming to power. The two countries experienced a series of political crises, including the downing of the

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<sup>62</sup> IEA, “A 10-Point Plan to Reduce the European Union’s Reliance on Russian Natural Gas – Analysis”, Policy Paper, Paris, International Energy Agency, 2022, <https://www.iea.org/reports/a-10-point-plan-to-reduce-the-european-unions-reliance-on-russian-natural-gas> (Accessed 23 May 2022).

<sup>63</sup> “A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy”.

<sup>64</sup> Ibid.

<sup>65</sup> Ibid.

<sup>66</sup> Ibid.

<sup>67</sup> Vatansever, *Oil in Putin’s Russia*.

<sup>68</sup> Dimitar Bečev, *Rival Power: Russia’s Influence in Southeast Europe*, New Haven, Yale University Press, 2017.

Russian fighter jet, the assassination of Andrei Karlov, the Russian Ambassador to Ankara, and the Syrian crisis, during which the interests of both sides were often in contradiction.<sup>69</sup> On the other hand, as indicated above, the natural gas trade between Turkey and Russia continued, and new pipeline projects were launched. This is a win-win solution that benefits both Russia and Turkey. While Russia circumnavigates the EU climate change regulations, Turkey has positioned itself as an important trade partner at the crossroads for energy trade with the EU.

## **Conclusion**

Since short-term political analyses fall short in explaining the longer-term trend of change in bilateral terms of energy trade between Turkey and Russia, this article has deliberated on the indirect and spillover effects of climate change, and the EU response to it on Russia's natural gas trade ties with Turkey. Climate change, directly and indirectly, impacts the Russian natural gas trade with the EU and Turkey. While direct impacts affect Turkey and EU energy policies and long-term strategies, the indirect effects run through the EU institutions and regulations, and are more visible and persistent. These spillover effects influence Turkey-Russia natural gas exchanges through climate-change-triggered EU regulations, which have a more technical and less political character.

The EU regulations on climate change have “pull” and “push” effects on Turkey's commodity trade relations with third countries, including Russia. They pull renewable energy from Turkey to the EU realm, as Turkey produces certified, cheap, and reliable sustainable renewable electricity, leaning on its relative geopolitical advantage as a neighbor of the EU. Turkey's intensified focus on increasing renewable energy production is also congruent with its long-term energy strategy. The changing energy regulations in Turkey are aimed at reaching a degree of energy supply security, reducing the energy-led trade deficit, and converging with the EU *acquis*. Consequently, in the 2010s, for the first time in history, Turkey became a net electricity exporter to the EU, producing energy mostly from renewable sources. This resulted in a decreased demand for natural gas in Turkey's conversion sector.

The EU regulations and trade rules, on the other hand, push Turkey to liberalizing its natural gas and electricity markets and integrating them with the EU, as preconditions for continuing trade relations. This change in the market structure and integration benefits the private electricity producers in Turkey, enjoying a stable and high demand from the substantial

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<sup>69</sup> Volkan Ş. Ediger and Duygu Durmaz, “Energy in Turkey and Russia's Roller-Coaster Relationship”, *Insight Turkey*, Vol. 19, No 1, 2017, p. 135–155.

and integrated electricity network of Turkey and the EU. But on the other hand, unlike Turkey, the Russian government has no intention of changing the ownership structure of the energy sector, despite the EU regulations, and energy has long been a crucial leverage for the Russian government and Vladimir Putin in dominating domestic and regional politics. Therefore, Russia uses its trade ties and pipeline network with Turkey to continue trade with the EU and circumnavigate the political pressures on energy imports that peaked in the 2022 Russian invasion of Ukraine.

While the prominence of the EU as a strong market for Russian natural gas rapidly diminished with the Russian invasion of Ukraine, Turkey continues to be a solid and reliable trade partner of Russia, despite occasional ups and downs in political relations. Turkey is pursuing a more balanced energy relations strategy than the EU's harsh engagement with Russia. This paper reflects on the trend of change in Turkey-Russia natural gas trade relations by examining climate change's direct and indirect consequences through spillover effects. As the adverse outcomes of environmental degradation are being felt more in almost every aspect of life on earth, more research is needed to analyze climate change's secondary and mostly implicit impacts on political and economic ties and processes.

## **Bibliography**

- A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy (2015). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank. <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex:52015DC0080>. (Accessed 7 June 2023).
- Acar, Sevil, Ahmet Atıl Aşıcı and A. Erineç Yeldan (2022). "Potential Effects of the EU's Carbon Border Adjustment Mechanism on the Turkish Economy", *Environment, Development and Sustainability*, Vol. 24, No 6, p. 8162–8194.
- Akçalı, Emel, Evrim Görmüş and Soli Özel (2023). "Turkey's Green Imagination: The Spatiality of the Low-Carbon Energy Transition within the EU Green Deal", *Uluslararası İlişkiler*, Vol. 20, No 77, 2023, p. 127-146.
- Alpan, Başak, and Ahmet Erdi Öztürk (2022). "Turkish Foreign Policy in the Balkans amidst 'Soft Power' and 'de-Europeanisation.'" *Southeast European and Black Sea Studies*, Vol. 22, No 1, p. 45-63.
- Anderson, Sarah E. et. al. (2018). "The Critical Role of Markets in Climate Change Adaptation", Working Paper, No 24645, National Bureau of Economic Research. <https://www.nber.org/papers/w24645>. (Accessed 7 June 2023).
- Aydın-Düzgıt, Senem and Alper Kaliber (2016). "Encounters with Europe in an Era of Domestic and International Turmoil: Is Turkey a De-Europeanising Candidate Country?", *South European Society and Politics*, Vol. 21, No 1, p. 1–14.

- Baghirov, Elmar (2015). “Turkish Stream Offers Russia Increased Export Control”, *Oil & Gas Journal*. <https://www.ogj.com/general-interest/article/17236931/turkish-stream-offers-russia-increased-export-control>. (Accessed 7 June 2023).
- Baran, Zeyno (2007). “EU Energy Security: Time to End Russian Leverage”, *The Washington Quarterly*, Vol. 30, No 4, p. 131–44.
- Bečev, Dimitar (2017). *Rival Power: Russia’s Influence in Southeast Europe*. New Haven (Conn.), Yale University Press.
- Bednar-Friedl et. al. (2022). “Adaptation to Transboundary Climate Risks in Trade: Investigating Actors and Strategies for an Emerging Challenge”, *WIREs Climate Change*, Vol. 13, No 2.
- Bennett, Gordon (2020). “The Role of Markets in the Energy Transition.” The ICE (Intercontinental Exchange, Inc). <https://www.theice.com/insights/market-pulse/the-role-of-markets-in-the-energy-transition>. (Accessed 7 June 2023)..
- Benzie, Magnus et. al. (2017). “Implications for the EU of Cross-Border Climate Change Impacts.” Project Final Report. Sweden, Impressions Project. [www.impressions-project.eu/getatt.php?filename=D3A.2\\_Indirect\\_Impacts\\_FINAL\\_14206.pdf](http://www.impressions-project.eu/getatt.php?filename=D3A.2_Indirect_Impacts_FINAL_14206.pdf). (Accessed 7 June 2023).
- Borders and Pipelines (2022). *Nature Energy*, Vol. 7, No 3, p. 213–213.
- Bosphorus Gaz (2020). “Profil”, <https://www.bosphorusgaz.com/sirketimiz-2/profil>. (Accessed 7 June 2023).
- BOTAŞ (2012). “2012 Yılı Sektör Raporu”, [https://www.botas.gov.tr/uploads/galeri/15-2019sektorap\\_2012.pdf](https://www.botas.gov.tr/uploads/galeri/15-2019sektorap_2012.pdf). (Accessed 7 June 2023).
- Bourgeot, Rémi (2013). “Russia-Turkey: A Relationship Shaped by Energy.” Paris, Ifri. <https://www.ifri.org/sites/default/files/atoms/files/ifriremibourgeotrussiaturkeyengmar ch2013.pdf>. (Accessed 7 June 2023).
- BP (2021). “Statistical Review of World Energy 2021”, <https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html>. (Accessed 7 June 2023).
- Canlı, Zeynep and Zeynep Çetinkaya (2022). “Rusya-Ukrayna Savaşı Türkiye’den Geçen ‘Orta Koridor’un Önemi Daha Da Artırdı.” Anadolu Ajansı, March 1. <https://www.aa.com.tr/tr/ekonomi/rusya-ukrayna-savasi-turkiyeden-gecen-orta-koridorun-onemini-daha-da-artirdi/2519232>. (Accessed 7 June 2023).
- Carafa, Luigi (2012). “Domestically Driven, Differentiated EU Rule Adoption: The Case of Energy Sector Reform in Turkey.” Francesc Morata and Israel Solorio Sandoval (eds.), *European Energy Policy: An Environmental Approach*. Cheltenham, Northampton, MA, Edward Elgar, p. 171-192.
- Claeys, Grégory, Simone Tagliapietra and Georg Zachmann (2019). “How to Make the European Green Deal Work.” Policy Brief, *Bruegel*. <https://www.bruegel.org/policy-brief/how-make-european-green-deal-work>. (Accessed 7 June 2023).
- Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC, 2009/73/EC Natural Gas Directive (2019). <http://data.europa.eu/eli/dir/2009/73/2019-05-23/eng>. (Accessed 7 June 2023).

- Dışişleri Bakanlığı (2009). “Türkiye Cumhuriyeti İle Rusya Federasyonu Arasındaki İlişkilerin Yeni Bir Aşamaya Doğru İlerlemesi Ve Dostluğun Ve Çok Boyutlu Ortaklığın Daha Da Derinleştirilmesine İlişkin Ortak Deklarasyon”, Ministry of Foreign Affairs of Turkey, February 13. <https://www.mfa.gov.tr/turkiye-cumhuriyeti-ile-rusya-federasyonu-arasindaki-iliskilerin-yeni-bir-asamaya-dogru-ilerlemesi-ve-dostlugun-ve-cok-boyutlu.tr.mfa>. (Accessed 7 June 2023).
- Ediger, Volkan Ş. and Duygu Durmaz (2017). “Energy in Turkey and Russia’s Roller-Coaster Relationship”, *Insight Turkey*, Vol. 19, No 1, p. 135–55.
- EMRA (2021). “Turkish Natural Gas Market Report 2020.” Sector Report. Ankara: Energy Market Regulatory Authority Strategy Development Department. <https://www.epdk.gov.tr/Detay/Icerik/3-0-94-1007/dogal-gazyillik-sektor-raporu>. (Accessed 7 June 2023).
- EMRA (2022). “Doğal Gaz Piyasası Aylık Sektör Raporu Listesi.” Official website. T.C. Enerji Piyasası Düzenleme Kurumu (Energy Market Regulatory Authority of the Republic of Turkey). <https://www.epdk.gov.tr/Detay/Icerik/3-0-95-1007/dogal-gazaylik-sektor-raporu>. (Accessed 7 June 2023).
- ENTSO-E (2023). “Cross-Border Physical Flow.” Database. Transparency Platform. <https://transparency.entsoe.eu/transmission-domain/physicalFlow/show>. (Accessed 7 June 2023).
- EPIAŞ (2021). “Epiaş YEK-G - Yenilenebilir Enerji Kaynak Garanti Sistemi.” EPIAŞ YEK-G. <https://yekgnedir.com/>. (Accessed 7 June 2023).
- EPIAŞ (2022). “EXIST - Energy Exchange İstanbul.” Şeffaflık Platformu. <https://seffalik.epias.com.tr/transparency/>. (Accessed 7 June 2023).
- EU (2007). “Communication from the Commission to the European Council and the European Parliament of 10 January 2007, ‘An Energy Policy for Europe.’” Communication. Brussels: European Commission. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM%3A127067>. (Accessed 7 June 2023).
- EU (2019). Regulation (EU) 2019/942 of the European Parliament and of the Council of 5 June 2019 establishing a European Union Agency for the Cooperation of Energy Regulators (Text with EEA relevance.), 158 OJ L. <http://data.europa.eu/eli/reg/2019/942/oj/eng>. (Accessed 7 June 2023).
- EU (2019). Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity, Pub. L. No 32019R0943, 158 OJ L 54. <http://data.europa.eu/eli/reg/2019/943/oj/eng>. (Accessed 7 June 2023).
- European Commission (2022). “EU Trade Relations with Russia.” Official website. [https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/russia\\_en](https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/russia_en). (Accessed 7 June 2023).
- European Commission (2018). “Europe Is Ready for Climate Impacts: Commission Evaluates Its Strategy.” [https://ec.europa.eu/clima/news-your-voice/news/europe-ready-climate-impacts-commission-evaluates-its-strategy-2018-11-12\\_en](https://ec.europa.eu/clima/news-your-voice/news/europe-ready-climate-impacts-commission-evaluates-its-strategy-2018-11-12_en). (Accessed 7 June 2023).
- European Commission (2022). “European Climate Law.” European Climate Law. [https://ec.europa.eu/clima/eu-action/european-green-deal/european-climate-law\\_en](https://ec.europa.eu/clima/eu-action/european-green-deal/european-climate-law_en). (Accessed 7 June 2023).

- European Commission (2022). “Joint European Action for More Affordable, Secure Energy.” Press Corner. [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_22\\_1511](https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1511). (Accessed 7 June 2023).
- European Commission (2022). “Third Energy Package.” [https://energy.ec.europa.eu/topics/markets-and-consumers/market-legislation/third-energy-package\\_en](https://energy.ec.europa.eu/topics/markets-and-consumers/market-legislation/third-energy-package_en). (Accessed 7 June 2023).
- European Council (2022). “Clean Energy.” Fuelling the Transition to a Decarbonised Economy. <https://www.consilium.europa.eu/en/policies/clean-energy/>. (Accessed 7 June 2023).
- European Council (2022). “European Green Deal.” The EU’s goal of climate neutrality by 2050. <https://www.consilium.europa.eu/en/policies/green-deal/>. (Accessed 7 June 2023).
- European Parliament (2021). “Internal Energy Market.” Fact Sheets on the European Union. <https://www.europarl.europa.eu/factsheets/en/sheet/45/internal-energy-market>. (Accessed 7 June 2023).
- Göksedef, Ece (2021). “Doğalgaz Sıkıntısı 2022’de Elektrik Kesintilerine Yol Açar Mı?” *BBC News Türkçe*. <https://www.bbc.com/turkce/haberler-turkiye-59821370>. (Accessed 7 June 2023).
- Hache, Emmanuel (2016). “The Geopolitics of Renewables: Does More Energy Security Come with More Energy Dependencies?”, *Revue Internationale et Stratégique*, Vol. 101, No 1, p. 36–46.
- IEA (2022). “A 10-Point Plan to Reduce the European Union’s Reliance on Russian Natural Gas – Analysis.” Policy Paper. Paris, International Energy Agency. <https://www.iea.org/reports/a-10-point-plan-to-reduce-the-european-unions-reliance-on-russian-natural-gas>. (Accessed 7 June 2023).
- International Trade Administration (2021). “Turkey - Oil and Gas Equipment – LNG and LNG Terminals, Upstream, Downstream and Midstream.” Turkey - Country Commercial Guide. <https://www.trade.gov/knowledge-product/turkey-oil-and-gas-equipment-Ing-and-lng-terminals-upstream-downstream>. (Accessed 7 June 2023).
- Jakob, Michael (2022). “Globalization and Climate Change: State of Knowledge, Emerging Issues, and Policy Implications”, *WIREs Climate Change*, Vol. 13, No 4.
- Karasar, Hasan Ali (2019). “Türkiye-Rusya İlişkilerine Genel Bir Bakış”, Halil Burak Sakal (ed.), *Türkiye-Rusya İlişkilerinde Enerji*. Nevşehir, Cappadocia University Press, p. 11-16.
- Kardaş, Şaban (2009). “Liberalization of the Turkish Energy Market Sparks Russian and European Interest.” Jamestown Foundation. <https://jamestown.org/program/liberalization-of-the-turkish-energy-market-sparks-russian-and-european-interest/>. (Accessed 7 June 2023).
- Kevin Adams et. al. (2020). “Climate-Resilient Trade and Production: The Transboundary Effects of Climate Change and Their Implications for EU Member States.” *Adaptation Without Borders*. <https://adaptationwithoutborders.org/knowledge-base/transnational-climate-impacts/climate-resilient-trade-and-production>. (Accessed 7 June 2023).
- Leal-Arcas, Rafael (2019). “Linking International Trade to Climate Change and Energy.” Rafael Leal-Arcas (ed.), *Solutions for Sustainability*. European Yearbook of International Economic Law., Cham, Springer International Publishing, p. 47-107.

- Masuda, Tatsuo (2007). “Security of Energy Supply and the Geopolitics of Oil and Gas Pipelines”, *European Review of Energy Markets*, Vol. 2, No 2, p. 1–32.
- McCabe, Kevin A. et. al. (2008). “Economics: Markets, Competition, and Efficiency in Natural Gas Pipeline Networks”, *Natural Gas*, Vol. 6, No 3, p. 23–26.
- McDonald, Jan and Phillipa C. McCormack (2021). “Rethinking the Role of Law in Adapting to Climate Change”, *WIREs Climate Change*, Vol. 12, No 5.
- Mikhelidze, Nona et. al. (2017). *The Moscow-Ankara Energy Axis and the Future of EU-Turkey Relations*. FEUTURE Online Paper, No 5. [https://www.feuture.uni-koeln.de/sites/feuture/pdf/D5.3\\_Online\\_Paper.pdf](https://www.feuture.uni-koeln.de/sites/feuture/pdf/D5.3_Online_Paper.pdf). (Accessed 7 June 2023).
- Miles, Tom (2018). “Russia Loses Bulk of WTO Challenge to EU Gas Pipeline Rules”, *Reuters*, August 10. Commodities News. <https://www.reuters.com/article/us-russia-eu-gazprom-wto-idUSKBN1KV1OX>. (Accessed 7 June 2023).
- Ministry of Foreign Affairs of the Republic of Turkey (2022). “Turkey’s International Energy Strategy.” <https://www.mfa.gov.tr/turkeys-energy-strategy.en.mfa>. (Accessed 7 June 2023).
- Monkelbaan, Joachim (2014). “Addressing the Trade-Climate Change-Energy Nexus: China’s Explorations in a Global Governance Landscape”, *Advances in Climate Change Research*, Vol. 5, No 4, p. 206–218.
- Moore, Christopher W. et. al. (2014). “Air Impacts of Increased Natural Gas Acquisition, Processing, and Use: A Critical Review”, *Environmental Science & Technology*, Vol. 48, No 15, p. 8349–8359.
- Myers, Norman (1993). “The Question of Linkages in Environment and Development”, *BioScience*, Vol. 43, No 5, p. 302–310.
- Ngene, Stanley et. al. (2016). “Environmental and Economic Impacts of Crude Oil and Natural Gas Production in Developing Countries”, *International Journal of Economy, Energy and Environment*, Vol. 1, No 3, p. 64–73.
- Oktav, Ozden Zeynep (2022). “Ukrayna Savaşı’nın Türkiye-Rusya İlişkilerine Olası Etkileri”, *Bilge Strateji*, Vol. 13, No 23, p. 18–23.
- Omonbude, Ekpen J. (2009). “The Economics of Transit Oil and Gas Pipelines: A Review of the Fundamentals”, *OPEC Energy Review*, 33, No 2, p. 125–139.
- Özbay, Fatih (2011). “The Relations between Turkey and Russia in the 2000s”, *Perceptions: Journal of International Affairs*, Vol. 16, No 3, p. 69–92.
- Permanent Mission of the Russian Federation to the European Union (2018). “Report of the WTO Panel on the ‘Third Energy Package.’” <https://russiaeu.ru/en/news/report-wto-panel-third-energy-package>. (Accessed 7 June 2023).
- Personal written communication with Deniz Daştan (2020). Query on the source of exported electricity to the EU. E-mail.
- Republic of Turkey Ministry of Energy and Natural Resources (2014). “Türkiye Ulusal Yenilenebilir Enerji Eylem Planı.” Ankara. <https://www.ebrd.com/documents/admin/trkye-ulusal-yenleneblr-enerji-eylem-planı.pdf>. (Accessed 7 June 2023).
- Republic of Turkey Ministry of Foreign Affairs, Directorate for EU Affairs (2020). “Chapter 15 - Energy.” [https://www.ab.gov.tr/chapter-15-energy\\_80\\_en.html](https://www.ab.gov.tr/chapter-15-energy_80_en.html). (Accessed 7 June 2023).

- Republic of Turkey Ministry of Trade (2021). “Yeşil Mutabakat Eylem Planı.” <https://ticaret.gov.tr/data/60f1200013b876eb28421b23/MUTABAKAT%20YE%C5%9E%C4%B0L.pdf>. (Accessed 7 June 2023).
- Sakal, Halil Burak (2021). “Turkey’s Energy Trade Relations with Europe: The Role of Institutions and Energy Market”, *Energy & Environment*, Vol. 32, No 7, p. 1243-1274.
- Schoenefeld, Jonas J., Kai Schulze and Nils Bruch (2022). “The Diffusion of Climate Change Adaptation Policy”, *WIREs Climate Change*, Vol. 13, No 3.
- Scholten, Daniel (2018). “The Geopolitics of Renewables — An Introduction and Expectations.” Daniel Scholten (ed.), *The Geopolitics of Renewables*. Lecture Notes in Energy. Cham, Springer International Publishing, p. 1-33.
- Scholten, Daniel et. al. (2020). “The Geopolitics of Renewables: New Board, New Game”, *Energy Policy*, Vol. 138, p. 111059.
- Scholten, Daniel and Rick Bosman (2016). “The Geopolitics of Renewables; Exploring the Political Implications of Renewable Energy Systems”, *Technological Forecasting and Social Change*, Vol. 103, p. 273–83.
- Siddi, Marco (2018). “The Role of Power in EU–Russia Energy Relations: The Interplay between Markets and Geopolitics”, *Europe-Asia Studies*, Vol. 70, No 10, p. 1552–1571.
- Tamiotti, Ludivine (2009). *Trade and Climate Change: A Report by the United Nations Environment Programme and the World Trade Organization*. Geneva, Nairobi, Kenya, World Trade Organization, United Nations Environment Programme.
- Tastan, Kadri (2022). “The Challenge of Decarbonisation and EU-Turkey Trade Relations: A Long-Term Perspective.” *SWP Comment*. C. 66. <https://www.swp-berlin.org/10.18449/2022C66/>. (Accessed 7 June 2023).
- TBMM (2001). Enerji Piyasası Düzenleme Kurumunun Teşkilat ve Görevleri Hakkında Kanun, No 4628. <https://www.mevzuat.gov.tr/MevzuatMetin/1.5.4628.pdf>. (Accessed 7 June 2023).
- TBMM (2005). Yenilenebilir Enerji Kaynaklarının Elektrik Enerjisi Üretimi Amaçlı Kullanımına İlişkin Kanun, No 5346. <https://www.resmigazete.gov.tr/eskiler/2005/05/20050518-1.htm>. (Accessed 7 June 2023).
- TBMM (2011). Yenilenebilir Enerji Kaynaklarının Elektrik Enerjisi Üretimi Amaçlı Kullanımına İlişkin Kanunda Değişiklik Yapılmasına Dair Kanun, No 6094. <https://www.resmigazete.gov.tr/eskiler/2011/01/20110108-3.htm>. (Accessed 7 June 2023).
- T.C. Cumhurbaşkanlığı Mevzuat Bilgi Sistemi (2014). Elektrik Piyasası İthalat ve İhracat Yönetmeliği <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=19679&MevzuatTur=7&MevzuatTertip=5>. (Accessed 7 June 2023).
- T.C. Cumhurbaşkanlığı Mevzuat Bilgi Sistemi (2013). Yenilenebilir Enerji Kaynaklarının Belgelendirilmesi ve Desteklenmesine İlişkin Yönetmelik. No 28782. <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=18907&MevzuatTur=7&MevzuatTertip=5>. (Accessed 7 June 2023).
- TEİAŞ (2022). “Aylık Elektrik Üretim-Tüketim Raporları.” Türkiye Elektrik İletim Anonim Şirketi. <https://www.teias.gov.tr/tr-TR/aylik-elektrik-uretim-tuketim-raporlari>. (Accessed 7 June 2023).

- TEİAŞ (2022). “TEİAŞ Kapasite İhale Sistemini Kullanabilen Firmalara Ait Güncel Liste.” TCAT. <https://tcat.teias.gov.tr/companies/registered>. (Accessed 7 June 2023).
- Tekin, Ali and Paul Andrew Williams (2011). *Geo-Politics of the Euro-Asia Energy Nexus*. London, Palgrave Macmillan UK.
- Vatansever, Adnan (2021). *Oil in Putin’s Russia: The Contests over Rents and Economic Policy*. Toronto, Buffalo, London, University of Toronto Press.
- Wakamatsu, Hiroki and Kentaka Aruga (2013). “The Impact of the Shale Gas Revolution on the U.S. and Japanese Natural Gas Markets”, *Energy Policy*, Vol. 62, p. 1002–1009.
- Ward, Hugh (2006). “International Linkages and Environmental Sustainability: The Effectiveness of the Regime Network”, *Journal of Peace Research*, Vol. 43, No 2, p. 149–166.
- West, Christopher D. et al. (2021). “Europe’s Cross-Border Trade, Human Security and Financial Connections: A Climate Risk Perspective”, *Climate Risk Management*, Vol. 34, p. 100382.
- Winrow, Gareth (2017). “Turkey and Russia: The Importance of Energy Ties”, *Insight Turkey*, Vol. 19, No 1, p. 17–32.
- Yilmaz, Gözde (2016). “From Europeanization to De-Europeanization: The Europeanization Process of Turkey in 1999–2014”, *Journal of Contemporary European Studies*, Vol. 24, No 1, p. 86–100.