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USD/TRY	8.87	DIESEL	7.38 ₺/LT
EUR/TRY	10.30	FUEL OIL	6.67

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Energy Policy Research Center

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Paris Climate Agreement: Signed or Implemented?

Başak Bozoğlu

Recently, climate change has increased both its individual and social impact in many areas. From documentaries to columns, from brands to factories, climate change practices are discussed. An almost forgotten debate resurfaced last week. President of Turkey Recep Tayyip Erdogan announced at the United Nations (UN) General Assembly that they plan to submit the Paris Climate Agreement to the Grand National Assembly of Turkey (TBMM) for approval. The first question that comes to mind is whether Turkey signed The Paris Agreement or not put it into practice. Why is such a statement being made now?

First of all, before answering the main question, it is necessary to explain the Paris Agreement and its political implications briefly. The Paris Agreement is a global agreement signed in 2015 under the United Nations Framework Convention on Climate Change (UNFCCC) and entered into force in 2016. 195 countries signed the Paris agreement, but the six signatories did not implement the agreement. Eritrea, Iranian, Libya, Yemen, and Turkey are countries that do not implement the agreement. Among these six countries, Turkey is in the top 20 in carbon-emitting.

The Paris Agreement, for the first time, takes the fight against climate change from an individual, regional or administrative concept and creates a global scope. The fundamental aim is to limit global average temperature rise to 2°C or even pursue to limit 1.5°C because of maintaining environmental diversity and habitats and reduce the hazardous impacts of climate change. The primary way to achieve this goal is to reduce the use of fossil fuels by countries and reach the net-zero by reducing carbon emissions with renewable energy sources. For this purpose, The Paris Agreement's goal is to mitigate the effects of climate change, financial planning in climate change adaptation, and support countries for economic and social transformation requirements while reducing global warming.

Interestingly, United States was the first and only country to withdraw from the agreement among the countries that signed the agreement. Former president of the United States, Donald Trump, announced that he was officially withdrawing from the Paris Agreement in June 2017. According to the rules, the United States must have spent three years in the agreement to exit the agreement, and exit takes effect exactly one year after the official application. Therefore, the USA became the first and only country to withdraw from the 195 countries that signed the agreement in November 2020. The USA ranks second after China in greenhouse gas emissions in the entire world. This move by the USA encouraged other countries that use fossil fuels not to stay in the agreement. Hence, it created many discussions and problems to avoid producing a solution with the Paris Agreement. However, former US president Trump used the expression "killing employment" for the agreement and said that "while enriching foreigners who pollute the environment, Paris Agreement will punish the American right." Trump argues that investing to reduce emissions means more costs for heavy industry, which also means less employment for American citizens. After the presidential elections in the USA, President Biden announced that their administration found the former decision unacceptable and signed the Paris

Agreement again in 2021. Biden administration claim that the USA will reduce emissions by 60 percent in 2030 and reduce emissions to 0 by 2050. Moreover, China, the world leader in carbon emissions, has committed to reducing its carbon emissions to zero by 2060.

In 2020, European Commission published a Fossil CO_2 emissions of all world countries. In this report, Turkey stood out as the European country that experienced the highest increase in CO2 emissions, increasing 186.6 percent between 1990 and 2020. Although Turkey signed the agreement, it did not have a comprehensive carbon emission reduction plan because it did not implement it. Turkey is the only G20 country that has not ratified the Paris Agreement and has not had nationally determined contribution (NDCs) for the carbon emission problem since 2021. However, President Recep Tayyip Erdoğan, in his speech at the UN General Assembly held in New York on September 21, ratified the Paris Climate Agreement and announced that they would become a party to the agreement. President Erdoğan says that "*Turkey is taking a historic step on climate change, one of the first and most critical steps of our 2053 vision. It was among the countries that ratified the Paris Climate Agreement in 2015. However, due to the injustices in the provisions, we did not initiate the approval process in Parliament. We decided to approve this agreement in our Parliament.*" Why Turkey decided to put the agreement into practice now aroused curiosity.

According to experts, Turkey complains about the lack of access to climate funds and sufficient financial resources such as the Green Climate Fund. Turkey is trying to find financial support through the Green Climate Fund by leaving the Annex-1 list covering developed countries. Although it was promised that a total of 100 billion dollars will be transferred annually to developing countries for harmonization actions, starting from 2020, 10 billion dollars have yet been collected in this fund. The Paris agreement evaluates the distinction between countries that will receive or will receive aid in two categories as "developed" and "developing" countries. Although Turkey is a developing country, it cannot benefit from the support provided by the Paris Agreement, as it is in the developed country group in the UNFCCC. Currently, the most considerable development is the strategy of creating a new and additional financial burden with exports to EU countries if the necessary measures are not taken due to the carbon regulations contained in the EU Green Deal. Therefore, Turkey decided to implement the Paris Agreement, as the economic cost of not joining the agreement could be greater than the cost of joining.

Paris Agreement actually is not even an "agreement" in the true sense of the word. It is a non-binding agreement that covers all countries at all levels, both in terms of welfare and level of responsibility in climate change, and aims to reduce local emissions for achieving the global impact of reducing hazardous effects of climate change. For this reason, it is extremely important for countries to announce their plans to reduce their carbon emissions to zero within the scope of the agreement, find financial support, and provide adaptation within the process.

The Aftermath of the German Elections: Climate as Kingmaker

Selin Kumbaracı

The federal elections that took place in Germany on September 26 were the first since 2005 in which outgoing Chancellor Angela Merkel was not up for election. Merkel's party, the Christian Democratic Union (CDU), and its sister party, the Christian Social Union (CSU), suffered the worst electoral results in its history in the wake of her departure, coming in second place with 24.1% of the vote to its former coalition partner, the Social Democrats (SPD), which received 25.7%. To put this in context, the conservative CDU/CSU bloc had received 32.9% of the vote and the SPD 20.5% in 2017.

The Greens placed third in the elections, winning 14.8%. While this is a significant rise from the 8.9% that they had won in 2017, there was still an air of underperformance due to how in the summer of 2021, the Greens were polling in first place for a brief period, surpassing both the CDU/CSU and the SPD. In fourth place came the liberal Free Democratic Party (FDP), with 11.5% of the vote.

Since no single party has won a clear majority and the SPD has only gotten a slim majority over the CDU/CSU, coalition talks—likely to be quite drawn-out—will be taking place to determine which parties will form Germany's next government. Leaders of both the CDU/CSU and SPD claim to have the mandate to take on this role. While the two major parties have entered into a coalition in the past, it is an unlikely outcome this time around. Consequently, the coalition that emerges will likely be dependent on the Greens and the FDP.

Currently, the two likely combinations are that of a "traffic light" coalition (named as such due to the colors of the relevant parties) composed of the SPD, the Greens, and the FDP or a "Jamaica" coalition (again, a name based on party colors) composed of the CDU/CSU, the Greens, and the FDP.

The two smaller parties have already begun talks among themselves prior to entering coalition negotiations with the SPD or CDU/CSU, setting up a common approach so as to bargain with the two bigger parties more effectively. As the Greens and FDP expressed on social media, "In search for a government, we are exploring common ground and bridges over dividing lines. And even finding some. Exciting times."

Nonetheless, there exist significant divergences between the positions of the Greens and the FDP. Notable among these is their approach to climate change. With all the potential coalition members supporting climate neutrality by around 2040-2050, there has been somewhat of a lack of real debate over the broader issue of climate change. However, where the debate indeed does exist is how to actually go about reaching climate neutrality.

With the Greens and FDP emerging as the decisive actors in coalition talks, their fundamental divergences on how to approach reaching Germany's climate targets will be a major faultline in the negotiations that will take place.

The Greens wish to enact an approach that gives a much greater role to government regulation such as stronger laws and potential bans, whereas the FDP would like a much

more market-based approach to climate policy, focused on decreasing bureaucratic hurdles to enable investment by companies in zero-emissions technologies like hydrogen and wind.

One such manifestation of this approach is the way in which the FDP emphasizes carbon pricing and leaves it to market mechanisms to incentivize emissions reductions. The Greens, however, are critical of this reliance on pricing carbon emissions, calling it "deeply socially unjust." While the two parties do agree on the need for increasing the prices of carbon emissions within the existing emissions trading system, whether this higher price will be determined by the state or the market is a key question. As one of the co-leaders of the Greens, Annalena Baerbock expressed in a speech to the German parliament, "The market won't regulate the climate crisis because the market does not care about people."

The FDP and the CDU/CSU share a similar leaning on this emphasis of the market, while the Greens are closer to the SDP in terms of emphasizing the importance of redistribution policies to ensure that households do not end up bearing the brunt of climate policies. However, they do diverge when it comes to Germany's phaseout of coal—the Greens want it to take place by 2030 while the SPD has supported this deadline being later, by 2038. The FDP, on the other hand, wants to put into place incentives as opposed to regulations to encourage energy providers to move away from coal and toward renewable energies before 2038.

Another contentious topic that is likely to play an important part in discussions is that of the Greens' car policies aimed at reducing emissions from personal transport, specifically their dual demands of a ban on vehicles with a combustion engine and the enactment of a 130 km/h speed limit.

So far, early talks between the Greens and the FDP are demonstrating some signs of compromise by the latter, especially toward speed limits, despite having been strongly opposed to both the measures proposed by the Greens.

While speed limits are an issue important to the Greens, a much more major one is that of the future of the combustion engine. It is not only the Greens that wish to phase out polluting vehicles—the European Commission, the EU's executive body, has also taken on this stance. While the Commission has proposed 2035 as the date for ending the sale of cars with a combustion engine, the Greens want an earlier date of 2030. The FDP is against a total ban on combustion engines, saying that gasoline and diesel engines remain as a technology option and criticizing that "the EU has unfortunately fixated one-sidedly on the battery-electric drive." This involvement of the EU could offer an easy way out during coalition negotiations, though, by allowing the parties to leave Brussels to deal with the controversial matter.

All in all, whether a "traffic light" or "Jamaica" coalition come to power in the months ahead, it is exceedingly clear that more so than any single party, it will be climate and energy policy that dominates the negotiations at every step of the way—the climate has arguably become the 'kingmaker' in German coalition-building.

A Looming Asian Energy Crisis

Barış Sanlı

The energy crises were a concept mostly associated with the West and developed world in our recent history. The developing world has always been vulnerable to energy crises. But an Asian energy crisis is a new thing; therefore, its consequences will be different.

The mother of all energy crises is the first oil crisis of 1973-1974 because of the Arab-Israeli conflict. In his book "Red Gas," Per Högselius explains how an oil crisis has created tensions in the European gas system. Dutch threatened others with gas if oil was not shared. At the end of that crisis, new institutions such as International Energy Agency emerged. Such events have big effects on countries and force them to act together.

In recent events, there are multiple stories. First of all, regional differences are obvious. While Europe and the US have succeeded in mass vaccination, Asia is still laggards. While the holiday season was strong in the West, Asia was struggling with Covid19 closures. This created asynchronous regional growth momentums—a complicating factor for analysis.

The core of the issue is natural gas and coal. Asia is susceptible to panicking more in scarcity periods. One of the patterns we keep seeing in Asia is the same panic for "trying to secure supply at all costs." That further feeds gas into the fire. The fundamentals, seasonality, the AI models can not forecast that. The premium associated with this panic spreads to other regions and feeds into a global panic.

One worrying factor we have recently is the record low level of Indian coal stocks. According to FT, "more than half the country's power plants have less than three days of supplies remaining." India's coal-fired plants are producing 66% of the nation's electricity. It is a worrying case since once the panic starts, the demand also gyrates unpredictably.

This is what we experienced in Britain. Most of the time, satisfying demand looks like enough for managing an energy crisis. But as the news spread, consumers tried to stock more than their normal demand. Whether it is toilet paper or gasoline, the same trend is observable everywhere. But gasoline gets you to work, where an economic activity creates other economic activities.

The Chinese situation is also worrying. More than 20 provinces of 34 Chinese provinces are struggling with power cuts. The issue can be traced back to the Chinese spat with Australia. Last year, the situation was less alarming. Before last year, the Chinese "Blue Sky" project also affected coal consumption. There are lots of reasons for the recent cuts. Coal mine accidents, surging coal prices, low tariffs, local governments' maneuvers to reach their end-year targets, drought, and other factors are all part of the problem.

The high coal prices and electricity cuts also created shortages for solar panels, chip production, and other industrial sectors. A coal product, coke is generally used for panel grade silicon. The gasoline crisis in Britain is to be solved by military assistance. In China and India, we have to see how things evolve, but an energy crisis in Asia will not be a regional event. This will be the first time such an event at this scale happens.

Whether Asian countries can contain such a crisis is irrelevant for what is to come next. The damage has been done, and policymakers have seen and felt the fear of such a scenario. Will this create new prospects for Asian energy institutions? Is creating common institutions the Asian way to deal with the problem? Is it the price, supply, or rationing the demand, or a mixture of all of them that will lead the Asian efforts? Maybe just like Europe, the industrial sector will give up steaming its engines and rest until problems become manageable.

Climate Concerns, Diplomatic Consequences

Onurcan Mısır

Four months ago, the District Court in the Hague ruled against oil giant Shell in its actions within the Paris Agreement, ordering it to reduce its CO_2 emissions much faster than it had planned. While Shell spokespeople stated that the company would refer to the court of appeal against this verdict, the decision was clearly significant, for it was the first time an oil company was found responsible by a court due to its lack of responsiveness regarding the Paris Agreement. The court verdict was cherished among environmentalist groups and set an important precedent for possible cases in the future. However, as an energy investor talking to the Financial Times said, "It's far from clear that the best venue to resolve these matters is a courtroom." The climate question has many aspects due to its energy production roots, including political, diplomatic, and even military.

While binding court decisions similar to the verdict about Shell can be a good solution to the non-binding nature of climate agreements, it is not exactly clear whether or not this bindingness would necessarily be helpful for climate actions expected to be taken, especially by governments. Especially for developing countries, the transition process to green energy and the reduction of CO2 emissions can mean a heavy economic burden, considering high technological and systemic costs. Even if these countries are willing to contribute to the process, they may not be ready to satisfy the necessities and require financial assistance. Court decisions and punitive actions may shift the opinion in these countries to a more conservative stance regarding energy production and climate change, and they may not be wrong altogether. Every country has the first and foremost duty to provide for its citizens and its national defense. Financial means allocated to energy transition can easily be spent elsewhere, including infrastructure or education investments, which would directly increase the life quality of the citizens directly. Under these circumstances, environmentalists or governments of countries leading the global green transition should seek ways to aid developing countries financially rather than taking court decisions and seeking punitive actions. Such actions would only shift the developing countries away from further commitments.

Furthermore, such binding and punitive decisions would also seem like an attempt to build a solidaristic international society for those countries which want, or need, to pursue their own ways. This would result in alienation, shift away

from international commitments, and lead to dangerous dilemmas in global diplomacy. The most appropriate example is the relations between China, the US, and Russia. History establishes that when China or Russia faced pressure and sanctions from the West, an outside force, these two countries immediately turned to each other with economic and military convergence. On the other hand, when the West seemed to have good relations with either of them, they loosened the ties between each other and turned to Western partners for all kinds of partnership. Today, China requires vast amounts of energy to provide for its overpopulated cities and holds an important military and economic power, which would be a game-changer if it converged with Russian power. Hence, even though it seems ironic, the best course of action for Western powers who emphasize green transition would be to work with Russia and/or China and not alienate them. If this alienation begins, Russia and China may again turn to each other for partnership in energy issues, and the green transition may be disregarded altogether. Similar concerns apply to almost all developing countries which lack proper necessities to fulfill their green transition responsibilities, such as Turkey, which decided to ratify the Paris Agreement next month. The incentives for these countries can be in many forms, the most important of them being financial. Instead of using a binding and punitive method, environmental groups and governments should find ways of integrating them into the process in accordance with their capabilities and needs.

In short, even though the latest court verdict regarding Shell's inaction towards the Paris Agreement is a monumental one for the environmental cause, it is probably not the best way forward, especially when it comes to punishing governments rather than big oil companies. If one aims to achieve a pluralist solution to the green question, the outcome will be a tremendous victory for all human beings. On the other hand, if a solidaristic approach based on bindingness and punishments is pursued, it will most probably end in a diplomatic, economic and natural disaster. In a time when our planet and public health are in massive danger, the stakes are too high for the decisions to be taken unilaterally.

Cyber Security of the European Power Sector

Kristína Žaková

Cyber security is becoming an ever more inseparable component of our efforts to ensure a secure and functional European economic infrastructure, especially when we consider the power sector. As the trend of a continuously growing electricity demand will probably persist, ensuring a secure flow of the commodity will depend more and more on our electric power systems' cyber resilience level.

Let us point out the cyberattack on the Ukrainian power grid that occurred in 2015. This event has demonstrated the potential impacts of such a suchlike cyber incident caused by a cyberattack on an electric grid. It has also highlighted the need to focus our attention on cyber security, particularly on the specific characteristics of the power sector that influence how we ensure its cyber resilience.

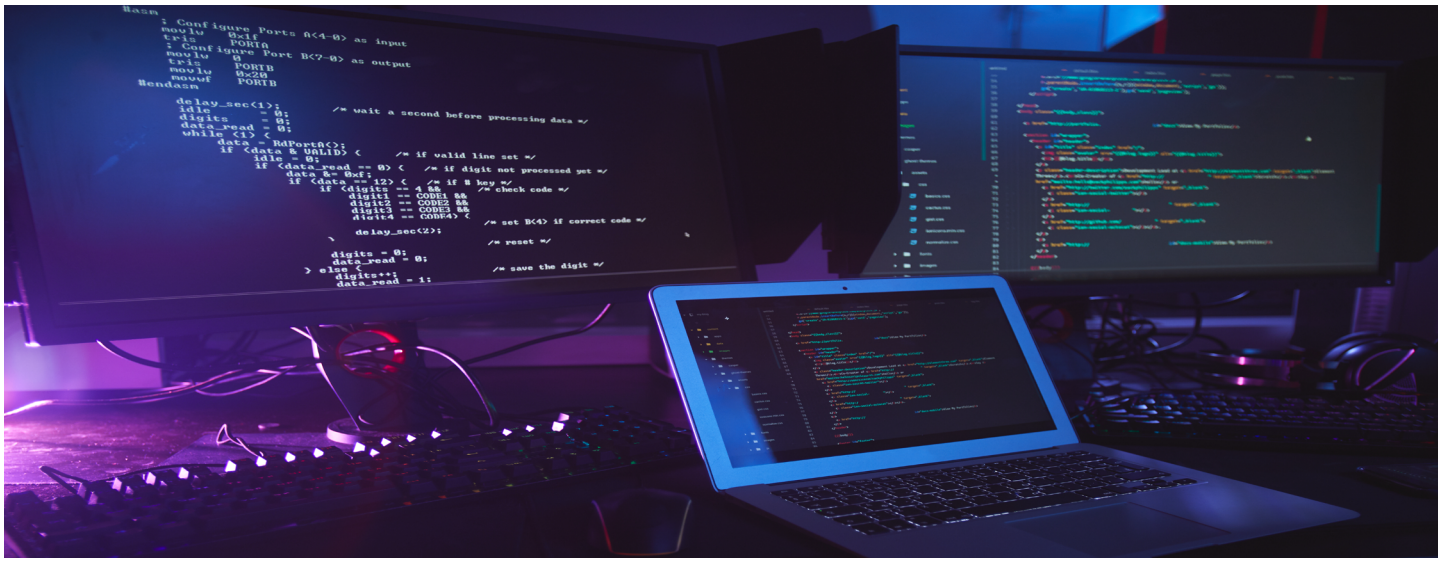
As the IEA warns, "the threat of cyberattacks on electricity systems is substantial and growing." However, we have experienced only a few successful and severe cyberattacks targeting the electricity- or generally the energy sector so far. Then why do we deem it important to focus specifically on the cyber security of the power sector? Why do we emphasize the growing importance of defining effective cyber security architecture for the European power grids?

An important part of the answer to those questions lies in the already mentioned sector-specific characteristics of the power sector. The process of cyber-securing the electricity systems is comprised of various components (such as risk management), which are sector universal. Yet, when it comes to the electricity sector, its specificities need to be considered when implementing those components. This might cause the process of ensuring cyber resilience to be relatively more complex.

Firstly, (not only) European power systems are largely characterized by a **technological mix** of newer and older components with a long operational lifetime. In the case of the latter, cyber security principles were rarely included in their security architecture. Nowadays, those “legacy” components transform power grids consisting of an increasing number of modern IoT devices. Such a mix of technologies with various cyber resilience levels may adversely affect the overall vulnerability of power systems unless technologically integrated cyber security measures are implemented.

Secondly, power grids are known to operate in **real-time**. Out of the CIA (Confidentiality, Integrity, Availability) triad thus, emphasis is being put especially on the **Availability**, i.e., the possibility of accessing information, data, or a computer system. Therefore, security updates must not compromise the functionality of the operational technology (OT) in question. Additionally, some traditional cyber security processes like authentication must either take only fractions of a second or are due to their response time being impossible to implement.

Lastly, we may not ignore the highly **interconnected** nature



of the power grids across European countries. With the ongoing decarbonization efforts and related measures aimed at effective integration of variable RES, enhancements of the electricity grid interconnectivity have been increasingly taking place in terms of both the electricity and the digital layer. This, however, means that a cyber incident occurring locally might cause a **cascading effect** with potentially large-scale impacts, affecting several countries.

The second part of the answer to the aforementioned questions is based on the main trends within the electricity sector, which, as much as the energy sector itself, is going through some substantial changes. As we have already suggested, the ongoing integration of RES as well as of other power grid components contributes to the overall grid **expansion** and power generation **decentralization**. Yet, one of the most influential trends in the electricity sector is the large-scale **digitalization** of which tempo has been in recent years growing significantly. We are observing a gradual physical-cyber convergence among power system components where traditional analog communication is being replaced by a digital one. The sectoral ICT (Information and Communications Technology) layer, which has been forming for already quite some time, thus complements the physical electricity grid. The convergence is then reflected at the level of information and operational technologies (IT/OT) where OT, such as remote terminal units, are being integrated into a digital network. OT and IT of new and legacy components are thus becoming more and more integrated, resulting in an overall increase in network integration.

In terms of cyber security of the European power grids, where do these sectoral characteristics and trends leave us? When taken into account, it is not the concept of cyber security that is subject to change. It is the level of its complexity and the difficulty of ensuring the cyber resilience of European electricity systems that are changing. Discussed trends bring along not only economical, security, and other benefits. They also contribute to, e.g., the expansion of the cyberattack surface or to the intensified concerns over the security of the supply chain, which supports power networks through the provision of specialized software, hardware, or services.

At the European level, such challenges are addressed by the NIS Directive (EU 2016/1148), which provides a legislative basis for cyber security practices and measures within key sectors, including energy. Currently, the proposal for NIS2 and Network Code on Cybersecurity are being discussed to overcome the limits of the current legislation and provide for an electricity sector-specific regulation of cyber security. Other than top-down regulation, however, we also need pertinent bottom-up activities. Regular cyber security personnel training or research initiatives such as in February 2021 opened Critical Infrastructures National Testbed Centre of Turkish SAÜ and STM, which provides an environment to develop cyber security solutions for, among other things, power grids, might help us to keep up with the changing environment in the power sector. Because it is the joint efforts that can enable us to ensure an integrated and adaptable cyber resilience of European electricity grids.

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