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SYNERGY

BİLKENT ENERGY POLICY RESEARCH CENTER NEWSLETTER



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BRENT OIL

78.42 \$/BL

GASOLINE

12.99 ₺/LT

USD/TRY

13.80

DIESEL

12.86 ₺/LT

EUR/TRY

15.65

FUEL OIL

9.33

EDITOR:

GÖKBERK BİLGİN

CONTACT: gokberk.bilgin@bilkent.edu.tr

ABOUT US



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Editor's Message

Dear Readers,

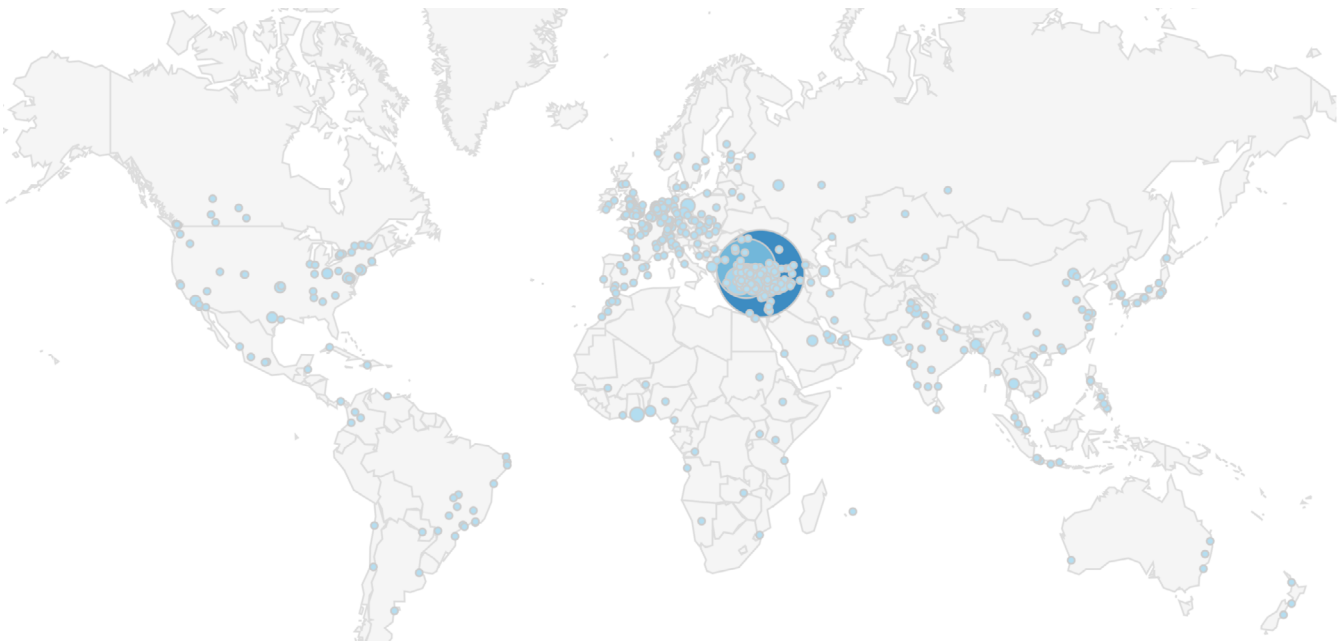
At the end of this week, as we publish the 71st issue of Synergy, we will leave the year 2021 behind. This year, while informing you about energy and climate change, we tried to create a platform for undergraduate and graduate students who want to improve themselves in these fields. Our academics, graduates, and respected energy experts in their fields, who have significant experience in the field of energy and climate, continued to support this year as well.

According to the data we obtained through Google Analytics, we reached more than 8500 people interested in energy and climate issues from 813 cities in the world in 2021, as you can see from the map below. We would like to express our sincere thanks and respect to all our readers who take the time to examine our work. This year, apart from Turkey, the countries we read about the most were the USA, Germany, the United Kingdom, and Pakistan, respectively. Our most-read article was "From Paris to Net Zero Emissions Target," written by Erinc Yeldan.

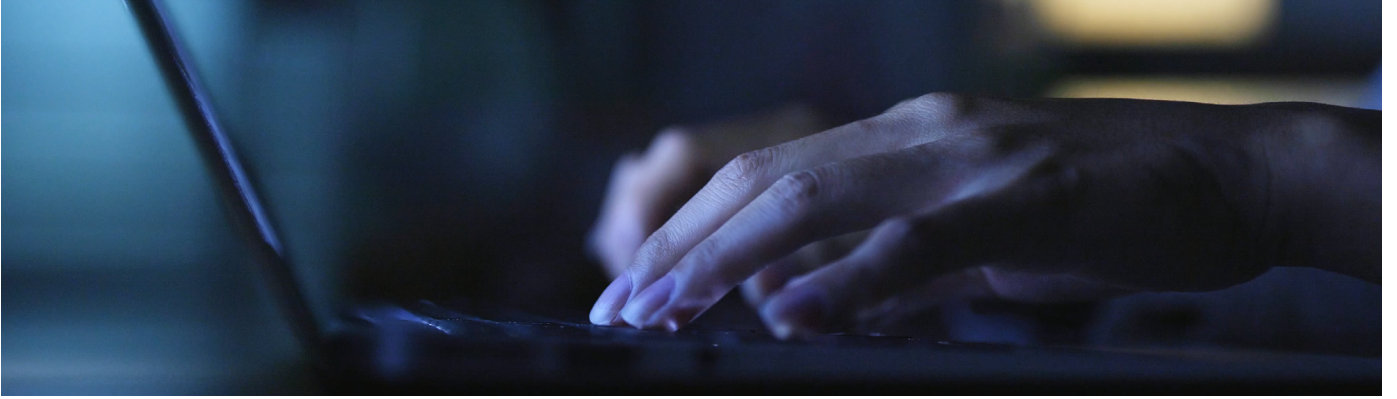
Our 27 valuable authors, whose names you can see on the next page, contributed to creating our content. We had the opportunity to produce hundreds of content covering a wide range of the energy sector through our valuable writers from different fields. This year, we have been faithful to our principle of giving equal voice to different opinions based on the data that we have set as the target from the first issue. We have allowed our writers from different countries to debate through their articles. We care about your criticisms to improve the quality of our work in the upcoming period. You can contact us to contribute to our newsletter and share your views.

We celebrate your new year, and I wish you health, happiness, and success in 2022.

Gökberk Bilgin



Our Authors in 2021



Ali Barışcan Kaya

Ali Berk Bilir

Alpcan Efe Gencer

Atahan Tümer

Barış Sanlı

Başak Bozoğlu

Büşra Öztürk

Can Arıhan

Değer Saygın

Ekin Yüksel

Erinç Yeldan

Erkin Sancarbaba

Fatih D. Oral

Gennady Nechaev

Gökberk Bilgin

Halil Öztürk

Hande Mert

Hasan Gürsel

İbrahim Halil Aslan

Kristína Žaková

Mihael Gubas

Onur Uyanusta

Onurcan Mısır

Refet S. Gürkaynak

Salih Efe Kahramaner

Selin Kumbaracı

Sohbet Karbuz

Yazgı Nur Akın

Was 2021 Just the Beginning of an Energy Crisis?

Bariş Sanlı 

Crises do not have a specialization because each crisis is a different kind of monster. For this reason, analysis of what was done right or wrong in past crises is more important than crisis expertise. Studying the past provides a toolkit. For this reason, it would be useful to keep the past events and results in the knowledge base.

The ancestor of all energy crises is the 1973-74 and 1979-80 oil crises. It may be necessary to look at these crises for two reasons. Many experts know very well the establishment of the IEA (International Energy Agency) against the Organization of Petroleum Exporting Countries (OPEC) in the first oil crisis. But EIA (Energy Information Administration), whose name is confused with IEA, dates back to the 1974's. With the Federal Energy Management Act, the tasks of "collecting, evaluating, analyzing, future reflections" of energy information were determined. Then the Office of Energy Information and Analysis was established in 1976, and then its name was determined as EIA.

The EIA is still the most important single point source of US energy data. So, when we think of a crisis, when we think of the lack of a resource or the high price, how was it that a "statistics institution" was established? Because the

inability to increase oil production in the USA during the oil crisis brought along the arguments that there were errors in the statistics given by the producers and that this caught the USA unprepared.

In times of crisis, data becomes even more important. Because, in the simplest terms, "if you can't measure, you can't manage." Therefore, it would not be wrong to say that in 2022 and beyond, we will enter a period in which data is spoken more and gains more importance.

So what should we do in crises? The people, the politicians, the technocrats, the markets? People want the price of everything to drop, politicians want to look good for the next election, technocrats want to put into action the plans they already had in their minds before the crisis, and the markets want to make a profit. To make everyone happy, "removing taxes, saying it's not in the hands of politicians, opening and accelerating a necessary season of unnecessary regulation, and keeping prices running pretty high" seems like a sufficient paradoxical condition. Thus, the consumer does not have to cut back on consumption; the politician does not lose votes, the technocrats strengthen their strongholds, and the markets provide a rapid return



on their investments.

It is useful to look at this situation in the 1979-80 period. Perhaps it is also useful to remember who came at the end of the USA's worst energy crisis in 1981: Ronald Reagan. The previous president, Jimmy Carter, is also in trouble with the Iran hostage crisis. But even though Carter prioritized alternative energy systems enough to be innovative enough to put solar panels (water heating) on the White House's roof and invest in synthetic fuels, the result was anti-regulation Ronald Reagan, who said let's look for more oil.

In the recent period, the system players have been the opposite of optimization. The most obvious reason for this is people's action-discourse distinction. Whether we accept it or not, it is like a universal law. This distinction between action and discourse is the difference between what people say and do. Everyone complains about paying taxes, but no one makes taxes the subject of a referendum. Everyone is an environmentalist, but consumption of red meat, energy, goods, and services continues at full speed.

It has been discussed for a long time that the end of oil has come to an end in the last 2008 crisis. Again, it was always

on the agenda that this world would not be enough and the resources would run out. One of the most distinctive features of this was the increase in documentaries and groups "preparing for the apocalypse."

According to BP Energy statistics, world energy consumption is 13% higher in 2020 compared to 2008. The climb of oil, natural gas, and coal accelerated. The period when the search for a sustainable world was at its peak also marked the beginning of a new fossil era.

But not everything is so sinful and hypocritical. PURPA law in the USA in the 1970s also became a kind of ancestor of renewable purchase guarantees. Years later, PURPA was also cited in renewable energy support mechanisms in Germany. The way for people to produce their own energies has been opened. This also led to the rise of cogeneration, simultaneous heat-electricity generation technologies, and natural gas. In the 2008 crisis, electric car companies such as Tesla also marked the beginning of periods such as automation and scaling in solar panel production.

In short, while the crisis had the opposite effect of what was expected in the near term, it also brought some of the expected effects in the medium-long term.



We should be surprised if we see more fossil fuel consumption in the exit from this crisis. For this reason, it is necessary to read the energy crises and the later ones from the data by closing their ears to the discourses.

I wonder if people are more inclined to form common wisdom or madness when they come together? If we look at the past examples here; In times of crisis, human societies lose their way; they cannot find the truth or the truth, what needs to be done. Both politicians and the public are actually deepening the crisis, just as US President Carter's treatment of synthetic fuels and people seeing their states as the only culprit in the 1973-74 crisis stemming from the Middle East. They destabilize the system even more. Because due to urgency, everyone wants results as soon as possible, and there is no time. Maybe it would be right to examine the USA and Italy's political transformation with the people's vote preferences after the 2008 financial crisis.

This energy crisis will be no different. In general, resolving crises in the shortest way, fixing prices, or supporting the consumer has not increased the voting rate in any of the countries I have studied. Because people see support as a right hence, their effect is zero. But since the crisis continues in one way or another, the "state" is always responsible. One of the interesting examples of this is now given by England. Twenty-one companies in the UK went bankrupt, but the UK did not provide additional consumer support despite high

prices. Although the Macron administration sent inflation checks in France, the rate of those who did not approve the policies is 57%, and this rate has been at the same level for the last year. Of course, Covid policies and economy are much more effective in these surveys. However, it can be claimed that energy supplements did not have a significant effect.

This is a very interesting dilemma. While the public complains at the price level, they punish the politician even if they get support. Because whatever the politician does, he is the chief responsible for this crisis. In other words, whatever the current governments do in this energy crisis, their job is difficult. In the European financial crisis, as in the case of Italy, it would not be surprising for the large masses who said: "it would be better if a comedian came."

So why? Crises take us all out of our comfort zone. Energy crises are also dragging us into an area we do not know. Since we do not question the past too much, we do not hesitate to make the same mistakes over and over again. For this reason, even with energy, crises are prolonged. While the volume of complaints from crises increases, none of us actually know what to do. Just as the world was blatantly dragged into an energy crisis from 2005 to 2008, we are still going to that conclusion even though we are blatantly complaining.



In fact, we have energy efficiency as a very clear tool. But it's more tempting to criticize the inefficiencies of others than to make ourselves productive. Maybe we feel like we did the right thing when we criticize, so we don't have to do it right. As we have seen in the past global examples, almost no consumer in the world takes action without feeling the crisis. In the USA, people change their vehicle preferences after waiting in long lines in gas lines, and the regulation also has an effect here. In the last Texas energy crisis, it can be said that although consumers were in crisis and knew the prices, they still could not prevent \$5000/week bills. But after that, an awareness began. According to some studies, their effects may not be long-term. After the 2008 energy crisis, we really saw efficiency in many electric consumption vehicles. Unfortunately, none of them was due to the consumer's interest, but it was an efficiency enforced by the regulations. This time, we should not expect it to be different.

So, does the world really drift from one end to the other like it did in the 1970s, 80s, and 2008s? It will most likely bounce again. In 1972, "Limits to Growth," the discussion that the resources will not be enough with modeling at MIT comes back as "degrowth" today. The limitation of fossil resources in the 1980s is always on the agenda. We cannot claim that we have gone too far from the discussions of the 2008s. Even the production of fuel from non-food agricultural products promised at that time was not discussed at all.

Ethanol production from corn in the USA during the drought period increased from 3.71 billion bushels (8 gallons = 36.4 liters) in 2008 to 5 billion bushels in 2020.

But this energy crisis will trigger innovation even more. It's unlikely that this innovation will come from the sun or electric car batteries if we look at past patterns. The innovation here has perhaps reached its limits (also with solid-state batteries), and it may need 10-odd years to take the next step. Hydrogen and fusion are on the agenda in every period. There is little chance that new innovation can come from here. But innovation can be expected on the gas, nuclear sides. Further electrification can also be expected in the way we generate and use energy. Another interesting point is that data and human behavior will become more prominent, and the importance of behavioral approaches in energy policies will result from digitalization. While the acceleration of innovation in materials and production with artificial intelligence is inevitable, its effects are even more uncertain.

The future will, of course, be different; every crisis is different. The results and effects will be different. But only by making notes to ourselves and to each other can we better understand and analyze crises and learn from each other and our past reflections. Unfortunately, whether we like it or not, we draw the best lessons from our mistakes. We should not be afraid of it.

Main Energy and Climate Events of 2021

Büşra Öztürk 

2021 has been the year of the world's recovery after Covid. The decreased energy demand increased again, and we witnessed the events in which we avowedly observed the consequences of climate change. On the other hand, the year is ending which we have collected important energy stories that are anticipated to be effective in dealing with climate problems. As we wrap up 2021, I would like to convey the important energy and climate occurring together that I think left their mark on this year, with brief summaries. If you would like detailed information, you may access it with news links available in the website.

The US rejoins the Paris Agreement: On the first day of Joe Biden's presidency, the global agreement that mandates countries to set carbon limits targeted at keeping global warming below 1.5 degrees Celsius was reaccredited. On the former President Trump administration's decision, the US formally departed the Paris Agreement last year and became the first and only country to formally pull out of the pact since it was enacted in 2015. The US President Biden emphasized that their actions on greenhouse gas emissions in the coming weeks, months, and years will be momentous. According to the agreement, the US will lower its emissions by around 25% by 2025 compared to 2005 levels under the parameters of the accord.

Global fossil fuels demand roared back: Demand for coal,

natural gas, and oil has surpassed pre-COVID-19 highs with the growth of 4.5%, 3.2%, 3%, respectively. However, the rebounding puts a damper on the hopes that the pandemic would expedite the transition to renewable energy from fossil fuels. According to the IAE Global Energy Review 2021, the global energy-related CO₂ emissions are on track to have their second-largest annual increase ever. This is because when the airplanes were grounded, industries were shut down, commutes were limited in 2020, the society did not replace any of those items for the world's reopening, they were just turned back on once vaccines became available.

Extreme Floods and Wildfires: There was a devastating flood disaster in Germany, and we experienced such a disaster in Rize. Although ours is more due to misplacement and landslides, we have started to experience natural disasters, especially as the effects of climate change in 2021. Subsequently, massive wildfires have started to be seen all over the world due to the soaring temperatures and strong winds. I believe that the world is giving us very serious messages with these disasters as we need to take urgent actions regarding climate change. Unfortunately, these kinds of extremes might be happening more frequently in forthcoming years as global temperatures increase.

COP26 Climate Summit: Leaders from nearly 200 countries gathered in Glasgow, Scotland, to negotiate the



possible global initiatives to combat climate change and to agree on new international climate targets, such as reducing methane emissions, beginning to transition away from gas-powered vehicles, and phasing out coal power. The most striking edit of the meeting was changing the phrasing from “phase-out” to “phase down” in the section dealing with coal. This linguistic change may potentially exclude countries from meeting their targets. While the meeting was not entirely satisfactory in terms of climate issues, constructive steps have also been taken. For instance, China and the US pledged to stop financing new coal power plants.

Green Steel Transformation has begun: Sweden, where is leading the transformation to green steel through two projects called Hybrit and H2 Green Steel, produced its first steel in late 2021 and plans to provide the market with zero-carbon steel at a commercial scale by 2026. Furthermore, major steel companies such as Arcelor Mittal and Nippon Steel have announced their carbon-neutral steel production goals. Zero-carbon steel will be a key fragment of decarbonization efforts, as steel production currently accounts for 7% of global greenhouse emissions, and steel demand is predicted to double by 2050.

First Energy Crisis of Green Transition: By the last quarter of 2021, Europe faced the prospect of natural gas supply shortages, and energy prices have surged to the highest

record ever. The lack of gas inventories could be simply explained by the fact that Norwegian gas flows were lower than typical, and supplies from Russia were limited while it was rebuilding its own inventories. However, the outcome of this crisis is not that simple and tells an important story about the world is nevertheless dependent on fossil fuels despite international agreements and efforts to achieve net-zero emissions. The insufficiency of energy stockpiles brings ahead questions on the reliability of renewables and their efficiency of them. In this sense, it has been interpreted as the first energy crisis of the green transition.

Artificial Rain: Dubai created artificial rain to tackle the high temperatures crossing 50-degree Celsius. The rainfall is produced by the method of cloud seeding, which promises to help alleviate drought conditions worldwide. This operation might be beneficial in combatting drought, one of the problems that may arise due to climate change in the future.

Despite the inconveniences caused by COVID-19 or foul climate events, we are almost at the end of this year. I hope that we will learn from our experiences and move forward with stronger climate goals. Best wishes for a healthy, just, equitable, and cooler 2022!

Starting Sustainability from Universities

Gökberk Bilgin 

The pace of change in our world has started to increase rapidly in recent years. While our living habits have changed with the innovations that technology has brought to our lives, we found ourselves faced with the problem of coronavirus and global warming, which affects the entire planet. Studies that have increased in number in recent years reveal that our current lifestyle will limit the years we can spend on this planet. We may think that these studies reflect reality entirely or ignore them. However, we cannot deny that we need to start preparations today to overcome the problems that we are likely to encounter in the upcoming period.

When faced with long-term problems such as climate change, solutions are generally offered under two main headings. The first of these aims to change our existing habits, and the second aims to reduce the damage we do to the environment by improving our technology. Universities, which provide human capital to people to take the necessary steps in both areas, have major responsibilities. The activities of the energy sector, which is shown as the main cause of climate change, is a very dynamic and exciting field that is affected by many different factors. The quality of our ability to work together in this sector, where different faculties in universities can be stakeholders somehow, will

show the quality of the solutions we will produce when we encounter problems.

For this reason, students who will come to decision-making roles in the future should acquire the necessary skills at the university. The word sustainability does not have a universally accepted definition since different priorities can lead to different perceptions of the meaning. You can think of the sustainability used in this article as being able to carry an organization with its current resources according to today and the future's requirements and constantly improve the way it does this business.

In the report titled "Solving the net-zero equation – 9 requirements for a more orderly transition" published by McKinsey in the past months, besides the importance of technological transformation in ensuring sustainability, the importance of managing socio-economic effects, persuading the society to change and building strong institutions, are also mentioned. It will be important to take each of these steps correctly to transform states and companies in the coming period. Therefore, students who have been able to practice on finding solutions at the university will have the opportunity to start their business life with an important



experience. While doing so, at the same time, they can turn university campuses into leading centers of transformation.

So, how should the university approach the event at this stage? It is possible to find many different opinions on this subject. The book *The Sustainable Development Goals – A Transformative Agenda*, written by Wendy Steele and Lauren Rickards, discusses four different approaches that vary according to the strength of the corporate commitment and innovation culture. When we examine the positive and negative ends of these, it is said that in the campuses where the institutional commitment is low, and the innovation culture is not widespread the interaction within the university will be weak and disconnected from each other. On the other hand, if the university is strongly committed to taking steps in this area and a suitable environment for innovation is provided, the activities to be carried out in this way will be transformative. Bilkent University administration declared this academic year the “Sustainability Year” and claimed that it would support activities in this field institutionally. Therefore, by providing an innovative environment, sustainability can be realized through transformative activities at Bilkent University.

In this context, as the Bilkent Energy Policy Research Center, we aim to create a platform covering our entire campus to support our university's sustainability activities, identify our problems together, and develop solutions by combining different perspectives. This platform will aim to develop detailed solutions to the identified problems by bringing together people who have received education in different disciplines in the light of recent the studies on design thinking, data analysis, problem-solving techniques, etc. For example, you might want to consider increasing the recycling rates of garbage at the university. Although there are steps regarding the separation and recycling of garbage on campus, we think an important area can be improved. When we deal with this problem with a sustainable approach, we can create a system that can solve different problems we will encounter instead of developing one-dimensional solution suggestions. If we need more trash bins for different trash bins to sort and collect the garbage on campus, instead of just putting them, we can design the whole process. For this, it can be started by studying the data of the daily garbage generated on the Bilkent campus and the areas of the campus where different types of waste are more concentrated. Then, the optimization work about how many trash cans should be in which region can be



done by the students of the engineering department. In addition, psychology and interior architecture departments can contribute to the design of garbage cans and encourage people to separate waste. At the point of changing the habits mentioned above, instead of the restrictive or punitive approach that comes to our minds, an order can be created to encourage people to willingly exhibit the necessary behaviors in the light of scientific methods. These designed boxes can be produced by related companies such as Tepe Home, which is part of Bilkent Holding. On the economic analysis side of the operation, the Department of Economics can do the calculations. The students in the social sciences can contact the municipality's garbage facilities to discuss how the garbage will be handled after the campus. Finally, the continuity of the contribution can be ensured by ensuring that the people who support the project can see the impact they have created. At this stage, the support of the Communication and Design Department

can provide important support in conveying how the process is progressing, and they can show everyone that the process works by producing various content. The outputs of the work done will be followed, and a more effective system will be created by making marginal improvements at the end of each year. If such a platform is created, dozens of different problems will be considered, and solutions will be created. The good thing is that not all projects even have to be successful. Projects that we can show to be successful where our technical capacity will not be enough can be realized even after the university receives professional service.

In summary, while developing inclusive projects on campus, requesting voluntary support from all relevant departments ensures that human capital can be used most effectively. At the same time, focusing to details will strengthen the sustainability of the work for the future years. The



participation of Bilkent members in this process related to the operation of the campus will enable them to be more committed to their work and increase projects' chances of success.

Making this system permanent and making improvements on the campus with new studies every year develops the campus according to the requirements of the age and allows the students who contribute to these studies to have the equipment and experience they can use when they start working life. If other universities conduct similar projects, when the newly graduated students began to enter the business world, it can start to transform it and support the increase of steps taken against the climate change.

In the movie *Don't Look Up*, which has recently been shown on Netflix, it is show that people bring the world to an end with systematic insensitivity. When it comes to

our way of handling the climate change, the reality is not much different from this situation. We believe that the solution is to gather people who want to work on this issue and make our lifestyle sustainable by making continuous improvements. On the other hand, university campuses are one of the best places to take the first step because while they host many highly skilled people from different disciplines, they also offer a small-scale environment where the things that need to be done to protect the planet can be tried. While wishing all our readers a good and healthy year, I would like to thank Erkin Sancarbaba, Halil Öztürk, Başak Bozoğlu, and Mustafa Eray Yücel for their support during the design phase of this project.

A Policy Recommendation on Upgrading Turkey's R&D in Energy

Erkin Sancarbaba 

As it is known, the evolution of energy production methods marks a new period of time in the energy sector. Within this context, the adaptation of Turkey to up-and-coming energy technologies is a national issue to make energy transition actual. Under current circumstances, the implementation of a new model to encourage and pioneer research and development activities has vital importance. This model should accelerate the R&D investments in nuclear and renewable energy by using our countries' financial sources most efficiently. Also, by implementing the aforementioned new model, Turkey can be an attraction center of qualified human capital and make progress on training capable personnel as well. The model that Turkey needs will be discussed comprehensively.

In the recent history of Turkey, it can be seen that there are a set of successful examples that can be served as a model, such as the improvement of the Turkish defense industry. Achieving the aforementioned success in the defense industry is came to realization with the well-planned set of policies that can also be implemented in the energy sector.

Under the regulations and fiscal rules that governments

strictly implement, it is not likely possible to make R&D and innovative works successfully. Although it is acceptable that governments should act upon certain rules and principles, allowing flexibility on fiscal rules and decision making in designated areas such as R&D activities on energy production is crucial to thriving.

In the first stage, the method of managing the money which will be used as the investment capital should be clarified. As a recommendation, by creating the "energy industry investment fund," which can enable financial flexibility and promote taking the initiative, it is an obligation to exclude the institutions that will manage the fund from strictly adopted governmental budget keeping. It is also mandatory to form a mechanism that will enable the fund to have its income and flexible budget. Moreover, the possible exclusion of the fund from the Public Procurement Law and Public Fiscal Management Law (no. 5018) can accelerate the projects and production activities that the investment fund will finance. When it comes to the administration of the initiative, an executive committee (might be chaired by the President of Turkey) can take autonomous decisions. Through the mentioned fund management, allocating more money



to R&D investments and human capital developments becomes inevitable.

Subsequently, gathering dispersed institutions and corporations which especially operate in the nuclear and renewable energy field and providing a collaboration atmosphere can make the technology and know-how transfer possible. On the other hand, in the current situation in Turkey, small corporations, which are independent of each other, allocate resources to research and development activities, whereas government agencies channel money into these ineffective R&D activities. The current policy ends up with disappointment due to the lack of cumulative practice and waste of resources. Consequently, an inclusive authority with a great prevalence to determine joint and comprehensive policy and control the R&D investments can ensure the efficient use of the sources and success of the research and development activities.

Furthermore, to attract human capital, the institutions and the public corporations that will carry out R&D investments and projects in the energy sector should not implement the salary and employment policies covered by the Turkish

public personnel system. In conjunction with the unique and attractive wage regime, which is possible according to the Decree-Law no. 375, it can be highly possible to draw the attention of specially qualified personnel across our country and the world. Additionally, forming a reward system that will award those who contributed to the successful R&D projects on nuclear and renewable energy systems might increase the new generation's attention and motivate the qualified human power to have a part in these industrial developments.

Though there are pivotal developments, such as the establishment of the Turkish Energy, Nuclear, and Mineral Research Agency, these kinds of reorganization efforts are not adequate to determine a sustainable and promising policy. The aforementioned new model, stipulated by the current state of the Turkish energy sector, should be considered as a policy recommendation. The model that is examined has the potential to become successful in the case of developing long-term and rational policies for the future of Turkey.



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