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SYNERGY

Bilkent Energy Policy Research Center Newsletter

Energy Policy Research Center

Notes from Energy Poverty Panel

On February 26, 2020, Bilkent EPRC hosted a panel on Energy Poverty Panel and Literature Review. Our guest speakers were President of GAZBİR, Yaşar Arslan, Tamer Emre from Aksa Enerji, and Barış Sanlı and Erinç Yeldan from Bilkent EPRC.

The event began with the presentation of Tamer Emre. In the first part of the discussion, Emre explained the evolution of the energy poverty concept by providing examples from the literature. He discussed how the definition of energy poverty shaped.

In the second part of the presentation, Tamer Emre introduced a study conducted by PwC on energy losses and illegal usages of energy. The study focused on whether there is a regional difference exist or not on illegal usages and if it exists whether they can build a mechanism to overcome the problem.

Tamer Emre suggested that the main problem with these studies is collecting valid data on the given region because people who conduct illegal activities are reluctant to share their information with the researchers.

To overcome this problem, Tamer Emre and his colleagues focused on the total consumption of the region. One of the most important results of the study showed that people who lived in poverty only consumed electricity they need and did not abuse the system. From this point of view, the authors indicated that if we can provide an effective mechanism for these people, illegal usages may decline.

Yaşar Arslan began his speech by addressing the different types of energy poverty, which are not accessing energy at all, insufficient access to energy, and being unable to access the energy that is provided. Arslan also focused on sociological issues. Yaşar Arslan claimed that in the 21st century, consumption behaviors of the society has changed. With the increasing usages of electronic devices, our overall consumption increased considerably compared to the 20th century.

Furthermore, Yaşar Arslan indicated that 80% of the natural gas consumers paid their bills on time, 15% of the consumers paid with the second warning, and 4,5% of the consumers paid the bills with the final warning while he was discussing on the incentive mechanisms.

Finally, Barış Sanlı discussed the public policy side of the issue. He claimed that in the older generations, being an efficient consumer was a motivation. At the same time, today, people more cared about luxury consumption by indicating that the average room temperature in Turkish houses is 25C, which is much higher than averages.

Barış Sanlı also discussed a government project that aimed to heat the schools in villages. By providing a warm environment, the government tried to help students enjoy their education and reduce dropout rates.

Overall, it was a very informative and joyful event. We thank our speakers for their contribution, and our guests for being with us You can also access Tamer Emre's presentation on our website.

Gökberk Bilgin

Nudging Energy Behavior

Energy efficiency is always preferable energy fuel. From negawatts to low hanging fruit, lots of tags are attached to it. On a macro level, energy efficiency can happen by either technological improvement or behavior change. As we talk more about the smartness of our energy system and digitalization, we have to understand the human instinct that interacts with the smart-digital system. Can these systems nudge the user for a more energy-efficient realm?

Nudging energy behavior is not a new thing, during the 70s and 80s, there were lots of advertisements, government programs for energy efficiency. However, we are coming to a dark reality about behavior change, does the consumer only react to price hikes?

During 2007, I was part of the project to explore sustainability options for energy policies. The project group was composed of well educated, activist, informed sector professionals. One of the transition during that period was switching from the light bulb to CFL (compact fluorescent lamps). I tried it myself and changed all my bulbs with CFL and reported the decrease in my bill. Some people from the group didn't concur with me and emphasized the adverse health effects of CFLs. Some also correctly mentioned how some cheap CFLs could be harmful to the grid through harmonic generation.

While walking back home, it was easy to spot houses with bulbs and CFLs, since bulbs produce a yellowish light and CFLs blue-white. A big CFL manufacturer also produced pamphlets and was distributing those in the biggest supermarkets to inform customers. But the lights from the houses were still yellow. After price hikes, this all changed.

Suddenly white light was victorious. The health hazards are forgotten, and the good old eye-friendly yellow incandescent light is damned. Today in most of the shops, you can not even find a yellow LED light because the customer prefers white light to be yellow, contrary to the social hesitation against white light 13 years ago.

There may be lots of reasons for the change. The availability, quality, design, price, and unavailability of incandescent light are all factors. But the shift is interesting.

Today consumers are more environmentally conscious. However, cars are getting bigger and bigger. In a diesel country like Turkey, environmental groups didn't mention diesel scandal once. The ecologically conscious consumers didn't bother it as well. Despite substantial technological improvements, smart houses are not the norm but still testbeds in terms of energy consumption.

Therefore we have to be very careful about revealed and declared preferences of consumers. There are environmentally conscious consumers, but the services for them may not be available. There may be millions of energy efficiency savvy people, but their preferences are hardly known.

Why a social media technology or platform like Facebook was used to manipulate the elections but not increase energy efficiency? That is probably because of the nature of the information. The information does not convey the truth most of the time. In recent times, information is much more about opinion than facts. So what is the public opinion on energy efficiency? "Good," and that is it.

What is the way forward? A combination of smart technologies, social media, new forms of media, and behavioral methods can be a good starting point. The first step should be to dissect consumer groups according to their revealed preferences, not declared ones. The second step is to design the services and make them accessible to these groups. However, to nudge the groups to the services, facts generally do not matter. That is very unfortunate, but opinion matters more. Data and facts are always relevant, but truth decay is a reality.

When opinions are essential, what the person believes in or identity becomes critical. For example, in a smart home experiment in the UK, males tend to use these technologies better than female members. That irritates the female members since the complicated nature of the system leads to discomfort. Therefore a smart energy-efficient house system should always account for a female opinion before male opinion.

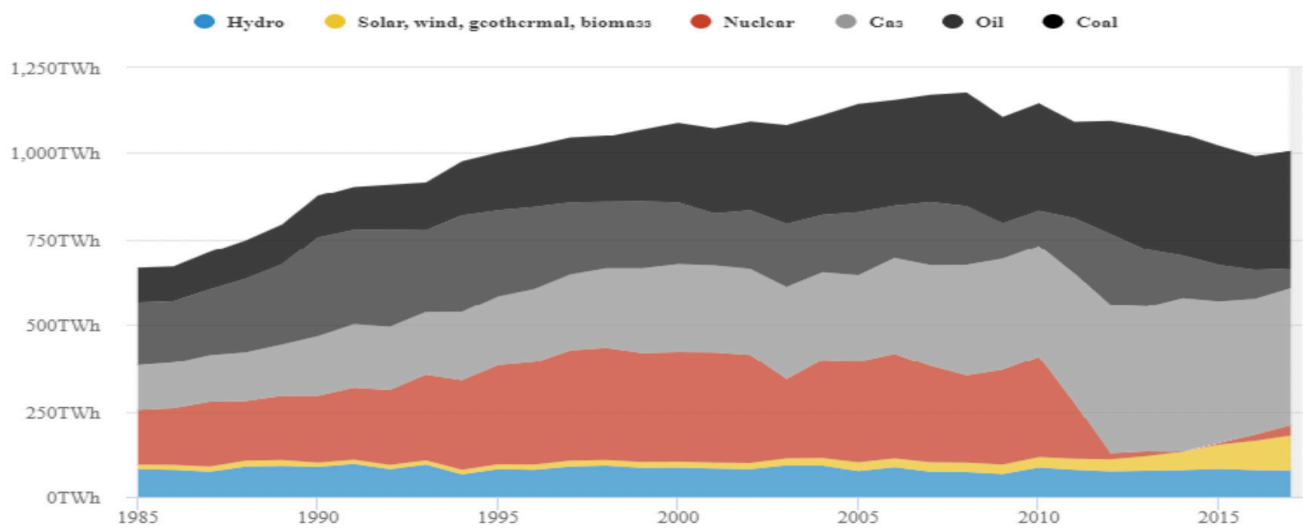
Also, just like selecting videos from online services, most of the consumers do not read the details or lengthy texts. They just make their choices based on visual images. For the same results, it may be better to warn about emissions for environmentally conscious groups and inform about the savings for the cost-conscious ones.

The other issue is how to make efficiency stick to our daily lives. The rebound effect is real, and we are lazy. If technology does all the efficiency things in the background, that is great. If not so, technology can nudge consumers with enjoyable animations and information. That may work better than numbers. In an experiment, a polar bear on melting ice visuals on a showerhead screen has pushed some consumers for less hot water usage.

Although it may sound controversial, the consumers may not be interested in numbers, facts, or scientific explanations. The opinion matters more, and we can not change it in favor of facts. Therefore the technology should help energy efficiency in the opinion realm. While doing this, we should remember identity, behavior, and relations affect energy demand probably more than government campaigns.

Barış Sanlı

Japan's Nuclear Question - Part II: The 'Nuclear Village'



The second part of Japan's nuclear question steps into the domestic debate regarding the use of atomic energy. In this part, I will start by presenting pro-nuclear local actors, along with their arguments and capabilities. 'Nuclear village' is the name refers to the pro-nuclear institutions and individuals in Japan, the 'village' includes governments at the national and local level, members of bureaucracy -especially in related ministries and regulatory bodies-, business associations, energy companies, media outlets, and academics. The most prominent actors within this abstract entity are The Liberal Democratic Party, Japanese Business Federation (Kaidanren), Japan Association of Corporate Executives (Keizai Doyukai), Japan Chamber of Commerce and Industry, Tokyo Electric Power Company (TEPCO), Kansai Electric Power Company (KEPCO), and Japan Atomic Power Company (JAPC). Compared to the anti-nuclear activist groups, the nuclear village appears as a more consolidated clique as a proper example of an 'iron triangle' -government, bureaucracy, and business.

The LDP -which has been the dominant party in the Japanese Diet since the year 1955 except for only three years- had maintained its pro-nuclear stance since the very beginning when it first came to power in 1955. The LDP governments have shown no intention to securitize the anti-nuclear discourse on their agenda. The party leadership believes that advanced technology, safety standards, and legal regulations render the use of nuclear energy away from being a threat to the security of human health and the environment. However, after the 3/11 incident, the party had to take some serious steps to restore its nuclear policy, such as the reinstitution of the regulatory body -Nuclear Regulation Authority (NRA)-, temporary shut down of the entire atomic reactors, and investments in renewable clean energy. The reason why the party insistently advocates multiple rights can explain nuclear power. The first, Japan is an archipelagic state that suffers from a lack of natural resources (mainly oil, gas, and coal) to supply the necessary energy that is vital for its vast industry, which renders the country dependent on the costly energy import. In this respect, two aspects of security emerge; energy and economic security. Nuclear power plants provide domestically-generated energy, which reduces the country's external dependency and offers the cheapest electricity, which is attractive if we remember the global oil crisis in the 1970s and the economic recession that the country suffers nearly for three decades. Even less than two years after the 3/11, Prime Minister Shinzo Abe pushed for 'nuclear renaissance' -restart of the nuclear reactors shut down after the 3/11- which he sees crucial for 'Abenomics' -his reform policies to revive the economy- to be successfully implemented. Secondly,

Besides its technological infrastructure, high numbers of power plants and a vast amount of radioactive material it possesses, Japan is the only country that is 'allowed' to enrich uranium without having nuclear weapons, which renders Japan as the likeliest country to produce its bombs within a concise time. In 2012, as LDP Secretary-General Ishiba Shigeru stated, "Having nuclear plants shows to other nations that Japan can make nuclear weapons," the LDP government wants to keep the nuclear option open. Keeping in mind that the Abe administration tries to take countermeasures against its giant rival China's military growth and North Korean aggression, in this sense, maintaining its nuclear potential is crucial to deter these two regional nuclear powers.

Thus, for the LDP side, nuclear power plants serve as a source of the country's military security. Thirdly, Japanese governments have been concerned with climate change since the beginning of the 1990s. In the year 1990, the LDP government adopted the Action Program to Halt Global Warming aimed at stabilization of carbon dioxide emission. In 1997, Japan hosted the Kyoto Protocol conferences marking the country's genuine efforts to fight climate change and global warming. Not surprisingly, pro-nuclear discourse and climate change concerns have gone parallel in Japanese politics thus far, the promotion of nuclear energy by the LDP governments as an alternative to fossil fuels gained momentum until the 3/11 Fukushima Daiichi incident.

In this respect, it was a concern of environmental security -in a different way as anti-nuclear actors voice- and a trade-off between reduced carbon emission and increased risk of radiation has been kept on the list. The pro-nuclear stance of the 'nuclear village' shows unanimity in no small extent, yet, the business pillar of this iron-triangle does not seem to have prioritized the environmental security. Most business associations (including Kaidanren) and energy companies (including TEPCO and KEPCO) have dragged their feet to comply with the new safety controls, shut down of power plants, and the LDP's new eco-friendly policies after the 3/11.

Hikmet Can Çakan

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Freedom of Contract under Energy Law

Freedom of contract is the freedom of legal persons to form any contract in accordance with their free will. This freedom is under the protection of Article 48 of the Turkish Constitution. It is further protected under Article 19 of the Code of Obligations. Freedom of contract contains the freedom to form and terminate the contract, make alterations in the contract, and the freedom to choose the other side of the contract. This freedom arises from the perception that all legal persons are equal.

Undertakings that are in the dominant position in the market can insist on their general terms of contracts on smaller undertakings. These results in some exceptions to freedom of contract, most importantly, the obligation to make a contract. That prevents the smaller undertakings from being abused by the ones with more economical and bargaining power.

The market economy aims to maximize the consumer's benefits on obtaining a good or service. That can be achieved only by a market where the undertakings are competing with each other. If the dominant undertaking is able to prevent entrance to the market, becomes a monopoly, or, in general, abuse that position in the market, the market economy will fail. In the case of energy, the prevention of a healthy market is so important that there are two state-owned mechanisms to regulate the energy market, which are Energy Market Regulatory Agency ("EMRA") and the Turkish Competition Authority ("TCA"). Although TCA is not focused on energy only, one of its five departments is focused on energy undertakings only. These two mechanisms work in accordance with each other. When some undertakings do not abide by the Act on the Protection of Competition, EMRA sends a complaint to the TCA since TCA's penalties are more preventative because they are calculated based on the undertaking's turnover.

Obligation to make a contract leads to two results, the first being obliged to provide their services to the weaker party and second being if the dominant party is abusing their economic power, the obligation to make a contract with the optimal terms. Obligation to make a contract will only apply to a monopoly that arises from a state action or a natural monopoly. However, the prohibition of discrimination while making a contract does not require a monopoly or an undertaking in a dominant position. Therefore, the obligation to make a contract arises if a customer asks the undertaking to make a contract and the inability of the dominant party to change the contract; however, they wish.

The legal basis of the obligation to contract is accepted to be Article 2 of the Turkish Civil Code, which covers the "good faith" principle. That applies whether the monopoly is born out of state action, or it is an actual monopoly. However, there are instances which the law-maker has specifically made it necessary to form a contract. Some examples can be Code No. 4646 on Natural Gas Market Law 4/4/e/2, which orders legal entities to provide gas entrance within the seasonal, daily, and hourly flexibility ranges. If the legal entity fails to do so, customers may refer this to EMRA. Similarly, Code No. 4054, Act on the Protection of Competition's fourth and sixth articles, which cover agreements, concerted practices and decision limiting competition and the abuse of dominant position, will dictate an undertaking to make necessary contracts to ensure a competitive market that maximizes consumers benefits from the market.

Legal persons who fail their obligation to contract under these laws will face the consequences if there is no valid reason for their failure. If a state-owned entity fails to ensure a contract is formed, the customer can refer the case to Turkish administrative courts for nullity or remedies. According to Ayranci, the decision for nullity by the court will not result in a contract to be formed between the parties, EMRA must take action to ensure the obligation to contract is fulfilled after the court decision. If the party still fails to make a contract, penalties will be applied. If the undertakings do not act in accordance with Act on the Protection of Competition, they will directly face penalties that are calculated from their turnover. TCA also orders the party to make a contract with the customer.

Canberk Taze

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Code No. 4054 on Protection of Competition

Code No. 4646 on Natural Gas Market Law

Nuclear Energy in Turkey: Akkuyu, Sinop And İğneada

	Type	MWe gross	Start construction	Start operation
Akkuyu 1	VVER-1200	1200	April 2018	2023
Akkuyu 2	VVER-1200	1200	2020	2024
Akkuyu 3	VVER-1200	1200	2020	2025
Akkuyu 4	VVER-1200	1200	2021	2026
Sinop 1	Atmea1	1150	uncertain	
Sinop 2	Atmea1	1150	uncertain	
Sinop 3	Atmea1	1150	uncertain	
Sinop 4	Atmea1	1150	uncertain	
Igneada 1-4	AP1000x2, CAP1400x2	2x1250 2x1400		

For nearly 50 years, Turkey has been planning to build nuclear power plants and operate this plant to produce energy plans. Having an increasingly important place in today's world, nuclear energy is a very important step for a country to grow economically and to produce its energy. Today, Turkey imports a very serious part of its energy needs. The primary sources Turkey uses to meet its electricity needs are natural gas (37%), coal (33%), and hydropower (20%). According to the Ministry of Energy and Natural Resources (ETKB), Turkey's electricity consumption in 2023 will jump to 357TWh. To supply such demand, create an alternative scenario to Russian and Iranian gas, nuclear energy could be a very efficient choice.

Since 1970, several nuclear power projects have been proposed. First, the purpose was to settle a plant with 300 MWe power. Six years later, Akkkuyu location was licensed for a nuclear plant, and in 1980, attempts to build several plants failed because of government budget problems. In 1993, a nuclear power plant (NPP) was on the agenda again, and the government started an investment program for NPP, and bids for 2000 MWe plant at Akkuyu were received. Early in 2006, Sinop province was chosen to host a commercial NPP. The location has a great advantage for cooling water temperatures by using cold Black Sea water. In 2006, the government announced that three NPPs with 4500 MWe power was planning to actualize in 2012-2015. The first units of Akkuyu were built at Akkuyu since the site already licensed, but the licensing process for Sinop was continuing. In 2007, TBMM legislated a law concerning the construction and operation of NPPs and their electricity sale. In May 2008, a civil nuclear cooperation agreement with the USA entered into force; in June 2010, a nuclear cooperation agreement with South Korea was signed, and in April 2012, two such agreements with China were signed.

With the agreement signed in 2010 between Turkey and Russia, Akkuyu NPP started, and its cost has guessed like 22 billion dollars. 4 units with 1200 MWe power each are expected to start operation in 2023. According to experts, Akkuyu NPP with four units can meet 10% of Turkey's energy needs. As the second project, Sinop NPP9 is expected to locate at Sinop, İnceburun. Its cost is guessed as 20 billion dollars. Experts announced that Sinop NPP could start operations in the 2030s. For the third NPP, minister of energy and natural resources announced that it would be located at İğneada, Kırklareli, in 2015. Its project will be maintained with experts from China and the US. However, its construction and operation dates are not determined yet.

Turkey has modest uranium resources. The Temrezli deposit in the central Anatolian region 220 km east of Ankara was discovered by the Department of Energy, Raw Material, and Exploration (MTA) in the early 1980s. MTA continued to explore the region for the next ten years. Regional towns of Yozgat and Sorgun are nearby.US-based Westwater Resources (formerly Uranium Resources Inc., URI) was planning to develop the Temrezli ISL mine. Australian-based Anatolia Energy had a 100% interest in 18 exploration licenses, which included the Temrezli project. Project activities were undertaken by Adur Madencilik, a wholly-owned subsidiary. In June 2015, Westwater Resources took over Anatolia Energy. In June 2018, Westwater Resources received notification from the Turkish government that its mining and exploration licenses for the Temrezli and Sefaatli projects had been revoked. The projects were owned by the company's Turkish subsidiary Adur Madencilik LTD CO., which had held exclusive rights for the exploration and development of uranium there since 2007 and had invested heavily in them. In December 2018, Westwater filed a request for arbitration on the matter.

Kaan Demirci

BRENT OIL	50.09 $/BL	GASOLINE	6.71 ₺/LT
USD/TRY	6.24	DIESEL	6.28 ₺/LT
EUR/TRY	6.94	FUEL OIL	3.54 ₺

Usage of Drones and Their Effects on Energy Sector

Humanity witnessed the dawn of drones in the last decade. It started as a simple plaything for fun, but as time went by, its areas of usage have increased drastically with ever-growing production developments over the product. As of this moment, drones can be used for pretty much everything (from commercial aerial surveillance to disaster relief), if one has the mind for it. The energy sector is one of the areas where drones provided several crucial advantages.

Protection

It is not a hidden fact that UAVs (Unmanned Aerial Vehicle) is currently being used for the military effort. Recent recordings from Turkey – Syria conflict show how much they can be useful, thereby being observed by experts. Approximately 40% of the world's oil and gas are produced where conflicts occur. Often, clashes involve attacks on pipelines, power plants, refineries, etc. Last year, attacks to Abqaiq and Khurais facilities reduced Saudi Arabia's oil production by about half – representing about 5% of global oil production. To prevent such events, private companies and states started using military drones. Iraq is currently using military drone systems to protect the only operational pipeline with Turkey. The country had more pipelines in the past —to Turkey, Syria, Lebanon, and Saudi Arabia — but they were shut down or destroyed as a result of wars and conflicts. Private companies, Gazprom can be given as an example, as they were already using mercenaries to protect their investments. Military drones became one of their security measures as well.

Inspection & Maintenance

According to recent data, drones are slowly becoming the leading actor of energy facility inspection and maintenance. There are benefits for every category in the sector. For oil, UAV use is getting more prominent on offshore oil rigs, especially. Typically, to avert catastrophes, visual inspections of the entire station need to happen regularly, and this was sorted out with manual inspection by humans. With drone use, the risk is avoided, the cost is decreased, and time is shortened. Similar scenarios are prevalent for solar panels, wind turbines, and power plants as well. There are many areas in these categories that are critical to production but generally unsafe to enter and inspect. Fortunately, an expendable drone that is not susceptible to harsh environments or emissions that would injure a human is now available to be used. Currently, thermal imagery and relevant software are crucial for time-saving, and cost-benefit maintenance actions for considerably all categories, and these features are easily added and started to be analyzed by drones.

Drones are vastly changing the energy world. They are fast machines that can send data in real-time back to technicians that improve the way that each of these companies operates. In the future, where drones are capable of construction in the energy sector as well, we can expect much lower prices for sustaining facilities and renewable energy production.

Yiğit Mert Yüreklitürk

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