

SYNERGY

Bilkent Energy Policy Research Center Newsletter



Energy
Policy
Research
Center

EPRC Farewells It's Captain and Welcomes The New Captain

Energy Policy Research Center has farewelled its energetic and successful captain Professor Hakan Berument as of last week. Berument has been the head of the center for over 20 months and achieved so much during his tenure that it is hard to summarize in a few paragraphs.

Berument has gathered a team of young researchers as well as industry professionals to boost the center's position and balance. EPRC's original contents and research questions were reflecting the policy agenda of Turkey and global energy issues. With over 70 studies, including Bilkent energy Notes, projects, presentations, podcasts, and meetings, Berument has been the captain of the armada.

The journey began with the economics course ECON318 (Seminar in Energy Economics) that Hakan Berument and Serkan Şahin taught together where students worked on a particular project that has the potential to solve Turkey's one of the energy problems in a specific area. The outcome of the studies was highly promising, and the students had a chance to present their projects in the World Energy Council. Later the Ministry of Energy and Natural Resources



of Turkey invited the project teams, and the undergraduate students this time presented their projects to Minister Fatih Dönmez himself in a private meeting and received his feedback. Up to now, the course created seven different projects, and it will continue to generate solutions for energy problems.

Furthermore, Berument initiated the policy paper series named Bilkent Energy Notes to develop solutions for the challenges that Turkey faces. With the support from graduate and undergrad-



uate students from various disciplines, universities, and countries, Bilkent Energy Policy Research Center managed to publish 30 different Bilkent Energy Notes in 20 months. These studies also helped students to develop their networks and conduct studies with professionals in the energy sector. Many well-respected specialists and scholars from the Ministry, international companies, and other universities participated. Fifty-seven students had a chance to work on the projects of the EPRC in the summer term.

Other than the Bilkent Energy Notes, EPRC began publishing a weekly newsletter, Synergy, where the students and professionals in the energy sector write articles together. We also have a podcast channel where the specialists discuss the current energy issues.

These accomplishments can not be attributed to the hard work of a single

man. But his dedication to team spirit and brilliance of motivating EPRC personnel will be remembered. So for all his commitment, time, and intelligence, we would like to say a farewell to our captain Prof. Hakan Berument.

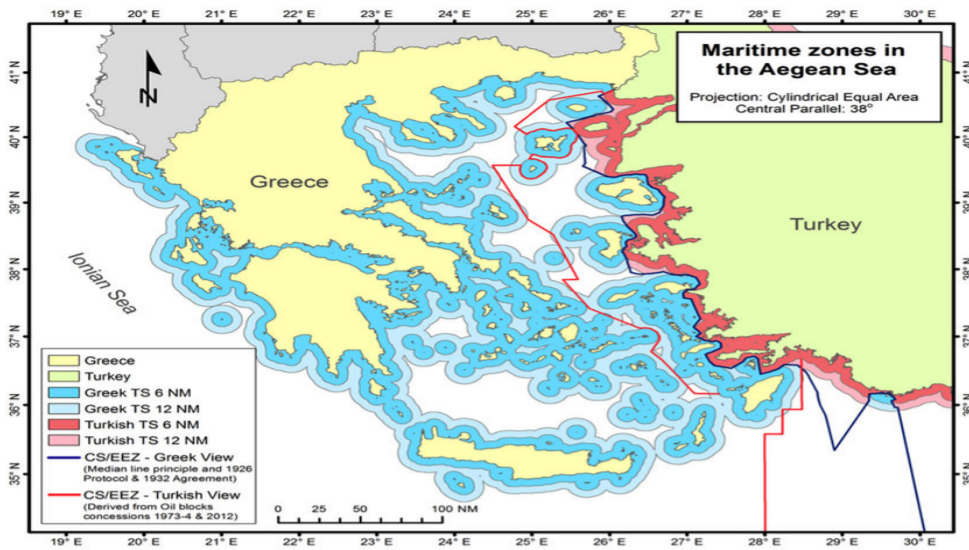
Our new captain is no stranger to EPRC, and he is the founding director of EPRC, a well-known economist and a successful scholar. Professor Erinc Yeldan has taken over the position as of last week. He is a very well-known environmental economist and has several studies on green energy. With his leadership and vision, EPRC will sail to the new horizons.

We wish our best for Professor Hakan Berument for the rest of his life and best of luck to Professor Erinc Yeldan on developing Energy Policy Research Center as a worldwide recognized think-tank institution.

Barış Sanlı - Gökberk Bilgin



Dispute That Lasted a Century: The Aegean Problem



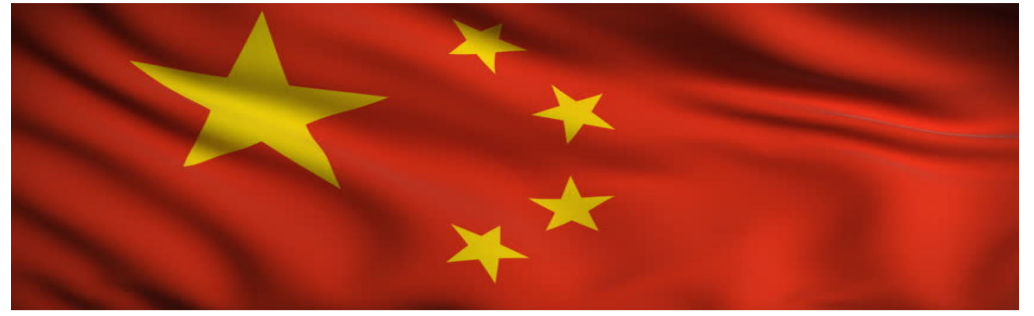
Aegean Sea is located between Greece and Turkey that consists of many islands and rocks, some of which are militarized by Greece. Contrary to the UN Convention on Law of the Sea (UNCLOS) territorial waters between Greece and Turkey as of right now are 6 nautical miles each, as its vital to the interests of Turkey. The breadth of the territorial seas should not be considered as 12 nautical miles because if that was the case, Turkish citizens would be locked out of Aegean Sea and would have to remain only in their territorial waters. By keeping them at 6 miles, middle of the Aegean Sea remains as high seas, helping trade ships to pass by will and remaining free trade. States also wouldn't be able to act accordingly to their military interests because the right to innocent passage of a military ship could be protested by the states.

Militarization of the islands of Lesbos, Chios, Samos, Ikaria, Lemnos and Samothrace was banned by 1923 Lausanne Peace Treaty and 1947 Paris Peace Treaty further confirmed the demilitarized status of these island and Greece ceded Dodecanese Islands on the explicit condition that they would remain demilitarized. Contrary to these agreements, since 1960s these islands remain militarized. Turkey can't go to International Court of Justice (ICC) regarding this situation since ICC only accepts disputes where it has jurisdiction. Since Greece reserved has a reservation to the jurisdiction of ICC concerning matters of national security, the Court can't give a binding judgement about this issue.

Turkey's interests regarding a 6 nautical mile territorial sea also contradicts with their interests in the Mediterranean. Since Turkey has to protest the custom 12 nautical mile baseline, they can't claim to have a 12 nautical mile territorial sea in Black Sea and Mediterranean as well. If Greece and Turkey make a bounding agreement between themselves regarding the status of the Aegean, Turkey could lift its protests against UNCLOS and have a 12 nautical mile territorial sea in the Mediterranean as well. As a side note, Turkey applies UNCLOS as customary international law. Nations not ratifying a worldwide treaty doesn't affect the bounding effect it has on ICC, only thing nations can do is to protest the treaty regularly so it doesn't become customary law. Airspace of a country also extends from their land to all airspace on top of their territorial sea. And in regard to airspaces, right to innocent passage doesn't exist. Since Turkey can't claim a larger airspace elsewhere because of Aegean, their security interests are at stake because it's harder to claim a security interest outside of your airspace.

Canberk Taze

China on Global Energy Governance



As being the rising power of the world economy and the main competitor of the United States, China prepares itself for its new role in global politics. The industrialization process, combined with cheap labor, offers a significant amount of current account surplus, and the Chinese government uses this source on improving its impact on the world. Up to the 1990s, the Chinese economy was self-sufficient on oil and was not importing it in a significant amount. However, after the shifts in the industry, Chinese cities grow, and demand for vehicles, roads, and other industrial goods increased rapidly. This created an enormous amount of oil to the region, and in years, China becomes the top oil importer country. Today, like the United States, they are implementing policies to reduce their vulnerability to petroleum.

In international politics, China desire to build its institutions that would compete for the existing global energy institutions. They are doing this through the organizations like the BRICS, Shanghai Cooperation Organization, and in Central Asia through the Silk Road Initiative. Gaye Christoffersen explains the reason for this policy in her article named The Role of China in Global Energy Governance. She states that to cooperate with the existing institutions means doing important reforms in the domestic energy sector for China. The existence of ungoverned places within China creates rapid increases on the oil demand, and smuggling activities cause the Chinese government to lose money. The lack of transparency on sharing the available data also problematic for building an alternative institutional system for energy cooperation. It directly creates diplomatic parties between the actors. According to the article, despite China's desires and perceives it as a strategically important policy, the lack of governance at the domestic level prevents its impact from reaching desired levels in the international system diplomatically.

Although their success is low on building an alternative institution for the global energy markets, the Chinese government is quite successful in building economic partnerships with the countries that have energy resources. Starting from the early 2000s, the presence of China in the Middle East increases. Since the Iranians offer the type of oil that China requires for their refinery operations, there is a growing partnership between these two countries. As Ponížilová suggests, the decreasing American investments to Iran replaced by the Chinese money. A similar investment also made to Venezuela as well. The Chinese government offered a \$50 billion loan to Venezuela in return for its oil and made an agreement.

Overall, China also becomes an important player in global energy politics. Even though they lack playing the game as Americans do on international organization level, they increase their influence by focusing on bilateral economic relations with the countries that have something to offer them.

Gökberk Bilgin

BRENT OIL

63.17 \$/BL

GASOLINE

6.94 ₺/LT

USD/TRY

5.73

DIESEL

6.58 ₺/LT

EUR/TRY

6.33

FUEL OIL

3.91 ₺

Operation Mediterranean Shield – Part II: The Old Trick of Turkish Sailors and Three Essential Tools of the Operation

Sir James Eric S. Cable, a former British ambassador, described by The Telegraph as “one of the most influential naval strategic thinkers of the last half-century”, defines gunboat diplomacy as the pursuit of foreign policy objectives with the aid of visible display of naval power; signaling an adversary with the threat of using force should the terms of the practicing state are not agreed.

On Issue 8, we have briefly talked about Operation Mediterranean Shield (AKH), its scope, jurisdiction, and naval assets available to counter detrimental efforts by foreign states on the exclusive economic zones (EEZ) of the island. Today we will be touching upon what particular tactics and exercises are being carried out by the Turkish Navy (DZKK).

We can split the Turkish response into two as the first one being the operational arm that is spearheaded by the AKH, and the second one being the exercises which lately is having more weight due to its flexible use to prevent Cypriot drilling efforts. When we observe the operational arm of the Turkish activities in the region, apart from the AKH, which we discussed in our previous issue, we see three mission-critical, fundamentally important military platforms. Submarines, uncrewed aerial vehicles, and the E-7T aircraft. The Turkish Air Force operates the latter in the region.

Submarines are understood as ships swimming under the sea that can launch torpedoes. But it is more than that. First of all, for navies, including the DZKK, submarines are also valuable tools for gathering intelligence. It is hard to detect a submarine, especially a diesel-attack submarine, even for militarily advanced states. And apart from torpedoes, they can also carry missiles to strike naval and land targets. Turkish Submarine Fleet entirely consists of German-made Type 209 diesel-attack submarines. DZKK operates two variants of this model, first one being the 209/1200 which is slowly being phased out of the fleet for the incoming new Reis-class submarines (Type 214TN) and the second one is the 209/1400 which differs from 1200 by being able to launch the Harpoon anti-ship missiles' submarine variant with a range of 220 km.

Given that, DZKK conducts clandestine and AKH-related submarine patrols on the south of the island, this is a very important capability for the Navy's efforts in the region because the 209-1400 model is a crucial safety guarantor by being able to closely approach contested zones such as the gas fields near the island and fire missiles if necessary that provides firepower beyond the range of a torpedo. They are useful stealth assets to monitor military and research vessel movements of the Greek side. The problem, however, is that the Greek Navy's submarine fleet also consists of the boats of the same class, and it also operates a more advanced submarine type of the same manufacturer, but this is a topic for the next issue.

The second and the third vital assets are coming from the aerial domain of warfare, and their contributions to AKH significantly supports efforts to formulate a naval picture that in turn makes DZKK sure of knowing the exact locations of every Greek, French and Egyptian ship and as well as their contracted commercial research vessels. It is reported that the Turkish Navy currently operates two types of unmanned aerial systems; Bayraktar TB2 and Anka. These two systems are medium altitude long endurance platforms (MALE) that work on attitudes above 20.000 feet with an endurance of 12-24 hours depending on the payload. The variants operated by DZKK are accurately reconfigured for naval requirements and have sensors that are used to detect submarines and low-visible surface targets. They have more massive payload with decreased endurance of 12 hours when compared to Air Force variants of the same UAV models. But this length is operationally satisfying for DZKK due to a variety of reasons. Firstly, as of October 2019, according to Turkey's defense industrial state body SSB, the Turkish Navy currently operates 22 Anka UAVs, and the number of Bayraktar TB2s with full operational capability is at least 5. It means a sizeable naval drone fleet of at least 27 aircraft, which several of them are armed variants. Few navies in the world possess a drone fleet as large as this that are capable of handling MALE-characteristic UAV missions. Neither the Egyptian nor the Greek naval aviation commands have this type of capability. This capability extends the surveillance and reconnaissance scope of the Turkish naval operations in the Eastern Mediterranean. Also, it is essential to note that these UAVs are also used to support AKH by escorting the research vessels Fatih, Yavuz, and Barbaros. They make a valuable escort asset for these vessels because warship and submarine escorts protect against conventional threats only. UAV support with strike capabilities also includes protection and



the ability to respond against the danger of sabotage and boarding, which are likely to happen in the region, given the intensity of confrontations.

As part of the AKH, the Turkish Navy also has assets tasked to follow and monitor foreign research vessels in the region. If the ship approaches close to a contested sector of gas fields, the Turkish warship quickly increases speed to reach the destination before the research vessel and is joined by another Turkish warship they issue a NAVEX stating that they will be conducting a naval exercise in the region with the usage of live, explosive ammunition. The downside of using this method to prevent the foreign actors from accessing contested zones is that, when you are also involved in seismic research and drilling efforts, they can be used against you as well. And there is no legal regulation that prevents you or the other side from doing so. And the Turkish Navy has been using this method or 'trick' as some would call, for over decades not only in Eastern Mediterranean but also in the Aegean Sea on contested lines of territorial water boundaries.

The third vital asset used to support AKH is the E-7T Peace Eagle airborne early warning and command aircraft of the Turkish Air Force. These are flying giant radars that scan the air and sea for targets and relay target data-friendly assets. Turkey currently has 4 of these planes; they are used continuously to support AKH and monitor foreign military activities in the Eastern Mediterranean. When compared to the aircraft of same roles, used by the neighboring countries involved in drilling efforts in the region, E-7T provides unmatched scanning, detection and locking capabilities with a radar scan radius of 240 kilometers against surface naval targets and from 370 to up to 600 kilometer scan radius for aerial targets depending on the search mode.



Therefore, it is crucial for Turkish naval staff to observe developments around the world that embark legal, geographical and military similarities with the situation in Eastern Mediterranean, such as the South China Sea crisis and the methods used by the Chinese Navy such as using large boats and Coast Guard cutters to ram foreign warships, that would propose new techniques and tactics for the Turkish Navy to maintain its area-denial capability and effectively prevent the other sides' efforts. Nevertheless, we should always remember that military effectiveness should always be supported by effective diplomacy.

On the next issue, we will be covering Greek-led efforts to counter the Turkish Navy and the civilian research ships Yavuz, Fatih, and Barbaros.

A Power Grid Overstretched for the Future

The power grid is named as one of the most complex, interconnected, and biggest machine human ingenuity has ever achieved. It works in real-time. The whole machine is designed to incorporate the uncertainty of humankind's request for ad-hoc energy needs and the failures of machines as well as cables. The tools, algorithms, engineering challenges are all accumulated in this backbone of the modern economy.

Now, the power grid faces at least twin challenges from climate change and renewables. Both seem to interconnect in the political agenda. But the grid never appears as an issue. There is just this "smartening" of this backbone, which has no unified definition. More and more technologies and communication systems will be integrated, and with a little bit of magic, there is the future grid. Then the platform and market place will be revolutionized with the grid transformation. It is the whole story.

But the reality is far from these aims. Recently wildfires in California have been a challenge for the future of grid discussions. In short, last year, power lines caused wildfires in California. This year the company implemented systematic blackouts to avoid any fires caused by power lines in the driest dates. The exciting part of the story is the company's efforts to instrument consumers resisted preventive line outages, and then next, or a few days later, fires erupted last year. Then the customers filed cases against the company for the wildfire damages. The company then applied for bankruptcy protection. This year, the company didn't leave any room for chance or customer resistance and started preventive outages. It affected 2.5 million people in California.

The increasing frequency of wildfires may be due to the warming of the climate. But we see an increase in the number and scale of disasters. The power grid is the most fragile part of this new equation. But to prevent climate change, more renewables had to be utilized. Then we came to the story of (South) Australian blackouts and UK power cut. For both cases, the renewables have contributed to the power disturbances.

Then the disasters and disaster preparedness enters the scene. According to Itron's "Disaster Preparedness 2019 Edition", after 1970, the natural disasters "quadrupled to 400 a year". For the US, the losses amount to \$1 trillion. The surveys are done in the US. 87% of customers are saying they have been impacted by one in the last five years. 53% of utility executives say they are very or extremely concerned about the likelihood of a disaster in the next five years. For the consumers, the same sentiment is at 40%.

We are sure that renewables are the way to go. The disasters are expected to increase. Electricity's share in overall energy consumption to climb up — customers' requests for cheaper electricity services to escalate. Then everyone's right to produce his electricity to be the norm. It is such a complicated optimization problem to be solved. One interesting strategy to solve this puzzle or optimization problem is to have a hybrid grid. The hybrid grid should have "micro or mezzo grids" connected with the mega grid. It should also have a silent and reliable operation as well as a smart mode. The topology should be as hard as the wires and poles, but it should be dynamically rerouted with algorithms and autonomous processes.

But today's grid is not there yet. More research and studies had to be carried out to find the way forward. For most of the customers, the network is intrinsic and natural. However, the future demands a more living and cosmopolite grid.

Bariş Sanlı

Movie Review: Zero Days



It is already past Halloween, but there is no real right time to tell a horror story. What you are about to read is going to haunt you down into an endless paranoia. I might have sounded like the beginning of an Edgar Allan Poe story, which is precisely what I intended to do. Nonetheless, there is a difference between Poe's stories and what I am about to tell. Poe was a gothic fantasy writer; hence, his stories were fictional. The story I am about to say is, here comes the scary part, real to the core.

Alex Gibney's cyber-war documentary "Zero Days", captures the essence of the new era of war. As the 21st Century citizens, we are already aware of the dangers and terrors of technology. Still, we never actually come to realize the potential of it as a weapon as destructive as a nuclear power. The documentary investigates this potential through the case of "Stuxnet". Stuxnet, as known as the Olympic Games (OG), is a cyber-virus developed by the U.S. and Israel to destroy the heart of the Iranian nuclear facility.

The difference between Stuxnet was the containment of several Zero days. I am not intended to give any spoilers so you can experience the same terror as it should be. Gibney's interviews reveal the chilling answers to critical questions. Can a malware infiltrate to a far-off land and destroy their projects? Can it cause damage to an economy of that state? And more importantly, can something that only exists in the cyber realm cause physical damage up to casualties? At the end of the documentary, we can answer these questions with a big fat, yes.

The cyber-world is the new warfare, and everyone prefers it. The experts are analyzing Cybercrimes in three categories. First, traditional cybercriminals who are aiming to money laundering; Hacktivists who are in it or fun or trying to give a political message; the Nation-States who are striving to obtain high-level intelligence or to attack. The first two categories are dangerous, but the third category has the objective to destroy. The world history has witnessed different forms of Nation-State terror, and it is reborn in a different one, as we observe in the documentary.

The cyber attacks are getting more likely to experience, and the improvement of cyber forces are increasing at a fast pace. There are no rules to this game. Except the only state is that do what you can get away with. And if the attackers get caught, the injured party can act the same way.

Irem Ayça Aykın

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