Volume 1 Issue 30 May 11, 2020

SYNERGY

Bilkent Energy Policy Research Center Newsletter

Energy Policy Research Center

Energy Transition in a Fragmented World

There are several scenarios about having a “green takeoff” after the depression. So more investments in green and renewable investments will increase jobs and stimulate growth. The rationale is simple. But this scenario was not necessitated by the crisis, but it was a well-known narrative before the crises. Change is the motto for everything nowadays.

Everything has to change, and the change is imminent, etc. For the covid19 crisis, we are pretty sure that there will be changes in our lives. Despite all this change literature, there is one thing that doesn’t change, and it is the expert’s ideas. If this change has not changed your ideas in any way and if you are still singing the old lullabies, it may be a possibility that you are getting it wrong.

The wave of green deals is not new. Just during the 2008 crisis, UNEP Executive Director proposed the “Global Green New Deal” to foster green development and to stop climate change. There are numerous green deals in between. Then came the US senator Alexandria Ocasio Cortez’s Green New Deal. Then Europe revealed a “European Green Deal.” All these ideas are the product of Keynesian templates with technology pulls. But naming all these “deals” in the same way shows us the shallowness of the options we have so far.

European Green Deal, in this sense, is aiming for a Carbon-based Border Adjustment Tax. So when you put artificial limits on your trade with other partners, it is for sure that your costs will increase. But at what cost? Europe thinks local industry and job creation worths this economically inefficient choice.

Then we have the growing disarray between the US and China. The question, of course, is the speed of energy transition where China is no longer the favorite production and supply hub. The solar technology owes its cost decreases to scale. If the markets get fragmented, the global scale will be divided into several parts. India is an alternative to balance China, sure. But alternative can be fractured as well, including several mid-sized countries.

Assume that, EU has pushed for more renewables and battery storage. That means it will also apply border taxes(“green deal” is implemented). Therefore, they will have an internal green industrial engine. So when they want to sell their products abroad, the border tax will be a problem because of reciprocity. Since the EU industry is protected by border taxes, China may gain a better share of the world’s renewable industry. As the discrepancy increases, the companies will make a choice.

A Chinese-American dispute is no different in terms of results. The US has no intention to have a “green” energy transition, but maybe a natural gas substitution is more likely. China also needs natural gas, and US production is important. For green industries, if there will be border taxes, then China has to produce more cheaply. Cheaper renewable production will kill more innovation in the pipeline. The car industry, battery storage, you name it. Anything seen strategically by the Chinese will be subsidized until they run out of money.

So the innovation engine will be broken, global scaling of new technologies will be damaged. Fragmented markets, more taxes, the urgency to bring back growth at all costs will create a more chaotic world. Along the lines, LNG is the only product that will not get affected by this new age of “border-trade barriers,” yet. In the world of scared global companies, it will take time to have the courage to change completely before the eye of risk-aware investors.

In conclusion, a leap to renewables -globally- is harder than before. Gas(with hydrogen) and renewables are much more likely to accompany each other. Border taxes, other green deals, and asset purchase programs are not new. What is new is our blindfolded march to a new reality by singing “change” rhymes. Welcome to the more fragmented, less innovative, and more adventurous world.

Barış Sanlı

Lessons from ’08 Applied to ‘20

The 2008 Financial Crisis had severe implications on the banking and finance world, and one of them was certainly on how the industry conducted its business. People had always been at the epicenter of the financial world, whether they were on the trading floor or creating forecast scenarios. However, an aftermath analysis of how some banks managed to make it through those times reveals an interesting pattern. Banks that had gone the extra mile and invested in the latest generation technologies were aware of the situation of the non-performing loans through a series of algorithms that had alerted the managers beforehand. When the liquidity started to dry-up in the market, the machines had already unloaded a significant amount of their NPL’s. They were faster than their human counterparts in processing the sale orders into the market when the need to do so arose.

Some people in the industry even refer to the banks of our current era as being more of tech companies than the financial institutions of the past century. Indeed, if you look at the skillsets being looked for in the job applications, it is common nowadays to see knowing programming languages being a must. The amount of labor this has forced cut in the sector is another contributor to the increase in the Earnings-Per-Share numbers for the industry.

So how does this reflect on oil? Much like the effect ’08 had on banks, the 2020 Oil Crisis will likely force change the structure of how Oil&Gas companies operate, whether small or big. Throughout decades of operation, the O&G firms have focused exclusively on making drilling operations as lean as possible. This was largely because the energy firms had the underlying reserves booked on their financial sheets as assets, and they needed to turn them into producing assets and also to replace their lost barrels of reserves faster. Investor sentiment is likely to have held a large responsibility for this. While drilling operations have developed extensively, other areas of operation have been neglected to a certain degree, much as to

how the banks have done in the past. The latest wave of large-scale digitalization in the industry has occurred in the 1990s, where the oil majors were acquiring one tech firm after the other to develop internal IT processes. But the real digital wave hit the world in the last decade, whether it was the developments of the Cloud systems, Artificial Intelligence, Machine Learning, Robotization, or Automation.

Sharing one common feat with the finance industry, that is having costly labor costs, the energy industry will likely resort to the application of companywide digitalization developments where they will be able to bring down the cost per employee to a minimum. There are already early adopters of this. The back-office jobs that usually curtail documentation and the reviewing of the said documentation are already being replaced by software designed to sort out the internally produced documents and automatically filter them out into the archives or flag for further human personnel review afterward. The cost benefits in the departments are said to be within the %75-%90 range compared to human-occupied positions—another point where there will likely be major changes in the usage of cloud technologies.

Currently, the industry is heavily reliant on keeping the data on physical servers on the premises of production. Being an extremely data-heavy industry, this is creating additional costs as the companies have to add servers on top of another one. In offshore environments, this is also taking away valuable space from the drilling operations on the platforms. At this point, we should remember that the underwater robots (ROV’s) the industry uses did not switch to digital formatting from analog formats until the late 2000s. The industry could be said to be slow to respond and adapt to certain matters. It should also be noted that a lot of the information being drawn away from the drilling is fragmented and requires labor-intensive processes to bring together and create interpretable datasets. If the conversion from the server-based system to cloud-based systems does materialize, we can expect to see AI’s to bring together the said documents, replace any faulty links in the datasets. If applied, machine learning can detect hidden links between wells or fields.

Improved safety of operations will also be achieved as the onboard personnel will have a wider variety of virtual training opportunities to use before getting on the drilling sites. If there is one segment of the industry where there will be visible changes in the near term, then it would be the trading department. Much like how the trading departments of banks have turned into digital High-Frequency Algorithms, the latest volatility in the financial commodity markets has shown valuable timing, and early analysis is. Robots can move and act in instances way faster than humans can, and the salaries in the trading departments can also run high for top talent in the industry. O&G companies will probably start their transformation from the back office as the front-office drilling prospects will likely be too expensive and complicated to handle in a short notice. Taking one step at a time, all industries reliant on keeping the shareholders content converge on the same topic, better Earnings-per-Share, and larger dividends.

Alpcan Efe Gencer

BRENT OIL	29.95 $/BL	GASOLINE	5.80 ₺/LT
USD/TRY	7.02	DIESEL	5.36 ₺/LT
EUR/TRY	7.60	FUEL OIL	2.51 ₺

The North Sea Wind Power Hub after the COVID-19

Although the E.U. is committed to take action for the climate and to meet the Kyoto and Paris Agreement requirements by using renewable energy sources like wind, current renewable capacity doesn't guarantee energy supply security. To increase the capacity, the countries seek to conduct innovative onshore and offshore activities. For many years, offshore wind energy technology becomes more important for European energy policy.

Even if the North Sea countries have a serious capacity, most of them still aim to increase their offshore production levels. To realize this aim, Denmark, Germany, the U.K., the Netherlands, Norway, Sweden, and Belgium decided to build an artificial islands system to generate electricity from wind in the Dogger Bank area (Dutch Exclusive Economic Zone). This project is known as the North Sea Wind Power Hub (the NSWPH).

It is a long-term hub and spoke project. It is regarded as technologically and economically feasible due to the large wind capacity of the geography and relatively inexpensive and innovative cable connections to the territorial area. The project has three main goals: to develop a bridge that will provide electricity trade between the North Sea countries, to make the conversion and distribution of electricity easier, and to offer a place for constructors and maintenance operators who experience some difficulties in the offshore activities.

The NSWPH also requires detailed strategic plans of countries and companies together. There is a need for technological and cost-benefit analysis, which should be supported by energy security and climate policies. Even if the building this kind of power hub on artificial islands sounds unrealistic, many experts believe that it's more important to put a vision and to start the feasibility studies immediately rather than to continue using the traditional energy sources. All these actions can be more effective with the national and the E.U. based support in terms of decisions and regulations.

The foremost point of this project is the emphasis on energy cooperation among these countries to fulfill climate change goals and energy sector developments.

The Consortium of the project mainly aims to make the offshore wind industry more sustainable and efficient by dedicating itself to ensure coordination and securing the supply and demand for energy without harming the environment. Thanks to this kind of project, Europe's ambition on decarbonization can show marked improvement by the stronger national desire and international cooperation.

The Consortium has indicated that in the 2030s, the first hub of the NSWPH will be electrically connected to the shore. As a result, the European current installed wind capacity will be increased to 150-180 GW by 2045. However, due to the COVID-19 effects on politics, economy, and energy markets, the financial supports for the offshore wind projects that are framed by some practices like feed-in tariffs, regulations, and policies will be affected and maybe dramatically changed. It is expected that the Consortium, which includes several big energy companies like TenneT Netherlands, TenneT Germany, Energinet, Gasunie, and Port of Rotterdam, will face some financial difficulties.

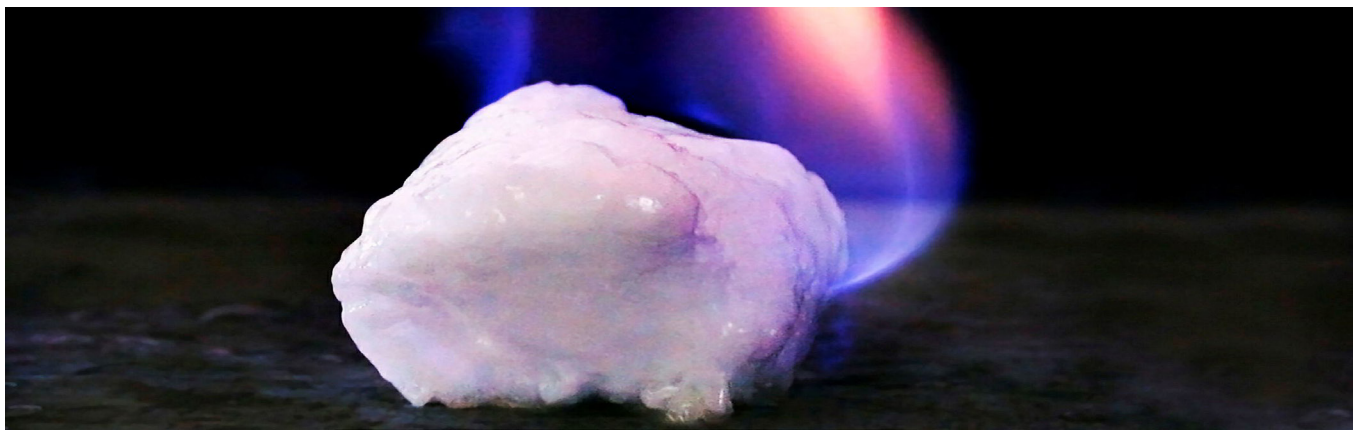
It is also expected that the industry and the Consortium, will see a negative trend because the trillions of euros will be spent to stimulate the economies in the wake of the recession. Weaken climate change actions will emerge due to the possible reductions in Green Deal policies and investments. So, the E.U. and the U.K. as parties of the NSWPH will probably be evaluated as politically, institutionally, and economically unprepared for a crisis in their markets.

Moreover, there will be some problems in the equipment production process not only in Germany or Denmark but also in the U.S. and China as the biggest equipment producer and exporter for the first-mentioned countries. It is expected that the wind industry will face severe impacts of logistic problems too. One of the main reasons is that there is a mutual interdependency situation in the supply of wind turbines, and this project is a big-scale wind hub that requires so many exported turbines.

From a general perspective, it can be said that the recovery progress after the pandemic will be hard for the wind industry because construction activities and installations will depend on the length of national lockdowns, and some construction restrictions might delay the NSWPH's schedules while increasing costs for developers.

Yazgı Nur Akın

Hydrates For All



Carbon Capture and Storage(CCS) has been on the agenda for a while now. More recently, the “Utilisation” term is also added to consider the process in a broader sense. By risking being oversimplified, I want to share a necessary thought process about one of the possible routes for CCUS. Ignorant speculation, a bet, so to speak.

First thought, harness the natural processes as much as we can so we don’t have to do it ourselves. Any solution to Climate Change has to be cost-effective and also scalable if it is going to have a significant contribution. A smart and sustainable way to achieve this goal is to make use of large scale natural processes that occur with slight adjustments like putting fans in front of the naturally flowing stuff to turn (wind turbines, tidal energy) or further even controlling that flow to some extent (hydroelectricity). Imagine if we had to spin all those turbines with muscle, suppose it wouldn’t be much useful.

Secondly, accepting our limits. There are some limitations to what can or can’t be done. These are usually engraved to the fabric of reality, like limits on material properties or evolutional behavior patterns. In other words, if we are to lower CO2 concentrations, it won’t be by people suddenly becoming more thoughtful and aware nor by a super laser-shooting the nucleus of CO2 atoms to eradicate them. Yet still, we have to capture the CO2 gas somehow, and somehow store it somewhere. There are numerous methods suggested for each of the capturing, utilizing, and storing parts. Among those pathways, one of the ways that make sense to me is to capturing and storing it in solid form, and by solid, I refer to a specific kind of solid named CO2 hydrate.

CO2 Hydrate is a solid form of CO2 forming under specific conditions (simply cold and pressurized). Now comes the part of harnessing nature. Making something cold against nature’s will is quite an energy-intensive job, additionally pressurizing it seems far from efficient. Thankfully we got oceans providing this service for us for free. Well, not exactly free. Unfortunately, the stored CO2 seems not to be stable enough and only stays in the deep ocean for a few hundred years, slowly contributing to Ocean Acidification and posing a threat to the marine biota. Moreover, oceans might be providing free storage, but putting the lot down there is a costly thing, bringing us to the transportation issue.

Although it is within our capability to do so, being able to inject something deep ocean is far from cheap. We can even supply energy to the seafloor by using waves if required. However, if something is to be transported anyway, it might be better to transport it in a solid phase since it takes a lot less space for the same amount of matter. IEA’s 2004 report on the issue points out that it will probably be much cheaper to transport captured CO2 in hydrate form.

Furthermore, the capturing part, hydrates are considered as an alternative, especially when it comes to industrial flue gas. Since CO2 has the lowest hydrate forming requirements within the mixture, it is possible to capture it by hydrate forming. Yet we also have to note that the hydrate capturing method is slightly negative in terms of energy balance when only the capturing part of CCUS is considered. Nevertheless, if we are to accept our limits for now and focus mainly on capturing from industrial zones rather than directly from the air, then hydrates are an option on the table.

Last but not least, there is another kind of hydrate named methane hydrates, which are potential energy sources for the future, in which the Black Sea has great potential. And hopefully, in days to come, the Black Sea will prove also to have great potential for oil. Minister Fatih Dönmez has announced that the drillship Fatih will probably start drilling in the Black Sea in July. It has been concluded by the source rock-oil analysis carried out by OMV(Austrian O&G Company), parts of the Western Black Sea are good candidates for such an exploration (Mayer et al., 2018). Let’s cross our fingers, for now, wish luck and hope for the best.

Hasan Gürsel

SYNERGY

Publisher: Bilkent Energy Policy Research Center
Editor: Gökberk Bilgin
Contact: eeps@bilkent.edu.tr
Synergy is a weekly online newsletter published by volunteers on bilkenteprc.com. It welcomes feedback from readers. Please submit your letters to eeps@bilkent.edu.tr. The Editorial Board will review the letters and print them as space permits. The contents of this newsletter are the author’s sole responsibility. They do not necessarily represent the views of the Bilkent Energy Policy Research Center or any of its Members.