# AI can help fight climate change by optimizing energy efficiency

Man-made climate change is an undeniable fact, and the need to mitigate its damage is all too real. We need to make drastic changes in the next 12 yearsto prevent climate disasters and reach our goal of restricting an increase in global temperature to 1.5 degrees Celsius. Time is of the essence, and that's where AI comes in.

"AI can make it much cheaper and much faster to analyze consumption data to find patterns that you can use to lower and make your energy use more efficient," Henrik Brink told TNW at North Star AI in Estonia.

That's why Brink founded Ento Labs, which helps companies and homes achieve better energy efficiency using AI – saving money and the environment.

"Energy efficiency is the only really direct way of lowering emissions," says Brink. "And according to our initial

research, there's a huge opportunity for lowering emissions. There's so many low hanging fruits of companies and industries that can be optimized a lot."

Brink points out that the need for energy worldwide will skyrocket, if we continue on our path of electrifying more parts of our energy usage. Electrifying allows us to cut down direct emissions which is extremely important, but we need to couple that with energy efficiency to keep the indirect emissions of electricity production low. Basically, we need to optimize energy efficiency, which is AI's forte.

Brink and his team created 'Ento AI' to help companies forecast their consumption and plan accordingly. The tool recommends specific energy efficiency initiatives – some in real-time – based on environmental impact and return on investment. Cynics could point out this is the 'money-making way' to save the climate, but realistically speaking, it could be the best way to get major businesses and industries to rethink their emissions.

Optimizing energy efficiency with AI can be an incredibly complex matter, but one of its simpler examples is choosing *when* to use energy. A big part of future energy grids is batteries, which can be used to store excess energy, and mitigate the variable output of renewables such as solar and wind. AI is essential in making these systems work, as it's fast enough to observe a myriad of variables, and make real-time adjustments to ensure the least polluting energy source is always chosen.

## Getting data to go green

Using AI to increase energy efficiency and reduce emissions is an incredibly promising approach, but it hinges on the availability of data – the lifeblood of AI.

"The key is *good* data, because if you just have data, you have

to spend a lot of time cleaning it. That's usually what you have to do for a company, as many have old databases scattered around in various places," explains Brink. "You can't just take it and use it."

This problem also exists in our larger grids. Smart meters are becoming more common, giving infinitely better insights than manually checking them a couple of times a year. However, in most cases, this data is locked up or not gathered centrally, making AI optimization much harder.

"Centralized data hubs really allow us to build these models with one format. That's what makes it scalable, and if it's not scalable, it won't have a meaningful impact," says Brink.

Companies like Google are already using AI-based energy solutions for their servers, but if we're to apply AI solutions on a bigger scale, we'll need better data to support innovation by AI startups and companies.

A handful of countries in Europe – like Denmark, where Ento Labs is based – provide companies and researchers with the opportunity to access energy consumption data to benefit the environment and consumers. More countries need to catch up on the fact that changing the way they handle data could be a step towards achieving emission goals – allowing AI to find solutions we haven't already.

Brink believes that this is only the beginning of AI's role in cutting down emissions and finding more sustainable ways for energy consumption.

"AI will help plan future rates and future energy production, so that it will become cleaner. And the only way it can do that is if you understand the consumption in a very detailed way," Brink explains.

With current climate models, we need to have net zero carbon dioxide (CO2) emissions by 2050, and *almost* net zero a whole

lot earlier. We can achieve that by eating less meat, using renewable energy, and cuting down on plastic and single-use products – as well as running initiatives for proper data curation. It's our shared responsibility to use all the tools at our disposal to mitigate climate change, and AI is one of them.

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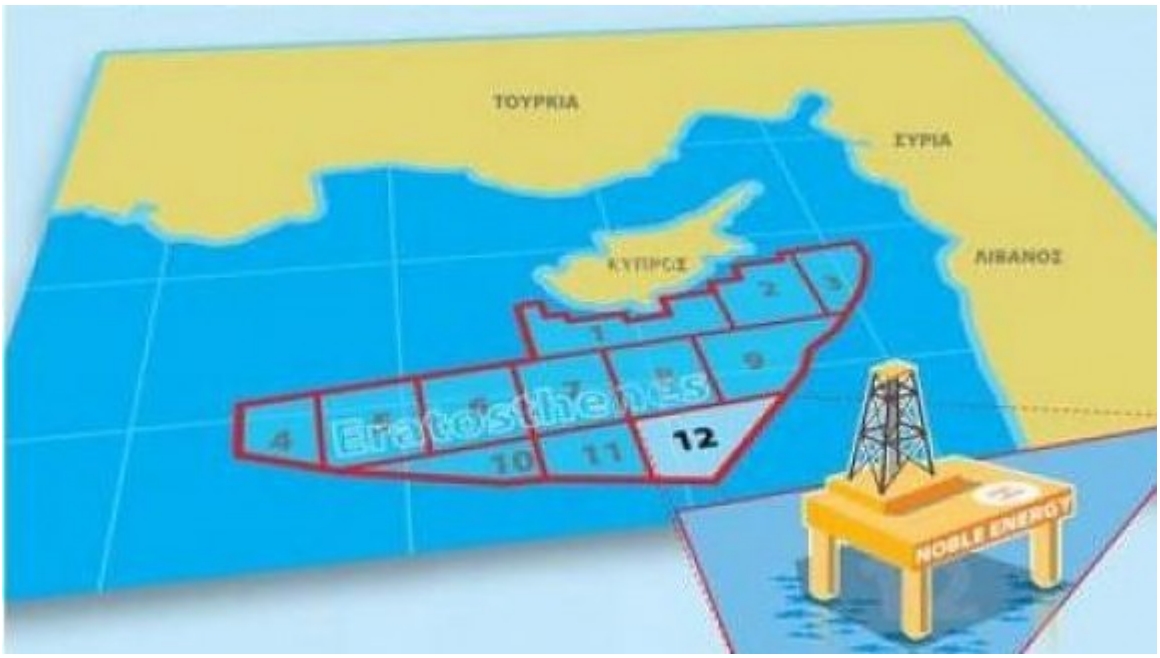
# ENERGY: Cyprus close to resolving revenue sharing dispute for Aphrodite gas




**Differences between Nicosia and the Noble-Shell-Delek consortium over a revenue sharing agreement for the exploitation of the "Aphrodite" field in Cyprus EEZ are soon to be overcome.**

According to sources quoted by Politis newspaper, the two sides are closer to an agreement after a meeting held on 7 March, where the last remaining – mainly legal – obstacles

where discussed.

Nicosia appears to be particularly optimistic as, according to Politis, Energy Minister George Lakkotrypis informed MPs during a closed meeting of the House's Energy Committee that the deal would be sealed within 2-3 weeks.

According to Politis, Noble is expected to submit to the government negotiating team a revised text of the proposed revenue sharing contract. If there are no serious objections from Nicosia, which would call for a new round of consultation, then the agreement will be signed.

The revised agreement involves the reduction in the anticipated revenues of the Republic of Cyprus and an increase for the consortium in the event that the price of crude oil is close to 60 dollars per barrel (a condition set by the consortium), if oil prices go up, then the Republic's revenue will increase accordingly.

Responding to MPs' questions in parliament, Lakkotrypis denied estimates of renowned expert Charles Ellinas that the new contract will see the Republic's revenues from Aphrodite limited to around €100 mln per year for the 15-year exploitation period of the gas field.

In addition, provisions have been incorporated into the contract, which according to government sources, better ensure the implementation of the land development program within specific timeframes.

From the reaction of MPs, it is clear that only AKEL does not support revision of the contract. AKEL continues to argue that the government should focus on building a land-based liquefaction plant in Vassiliko, by including findings in the Aphrodite gas field (with an average estimate of 4 trillion cubic feet).

Governmental officials, including Lakkotrypis, have stated,

that the construction of a terminal remains a strategic goal, but it is not related to Aphrodite, as this reserve is now ripe for exploitation and the only tangible option for selling the gas is Egypt.

Other parties seem to favour the deal which is to see gas transferred to an LNG plant in Egypt for economic as well as geopolitical reasons.

Once the new contract between the Republic of Cyprus and the companies is finalised and signed, the Noble-Shell-Delek consortium, along with representatives from the State Hydrocarbon Company are to restart negotiations with the operators of the terminal at Egypt's Idku this year for the sale and liquification of the reserves in the Aphrodite gas field.

It is estimated that it will then take 2-3 years to complete the studies for the Final Investment Decision and 3 more years for the construction of the mining infrastructure and a pipeline to transport the gas to the Egyptian coast.

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# FOR ITALY'S RULING NATIONALISTS, ENERGY SECURITY MORE IMPORTANT THAN PUTIN'S FRIENDSHIP [GGP]

New natural gas discoveries in the Eastern Mediterranean might be a boon for the European Union's efforts to move away from dependence on Russian energy supplies. In the current complex energy game between Europe and Russia, Italy could play an important role as an entry point for gas deliveries from Egypt, Israel and Cyprus, despite the current Italian government's largely sympathetic stance toward the Kremlin.

On February 28, the United States energy giant ExxonMobil announced it discovered natural gas off the southwestern coast of Cyprus. The new find adds to other giant offshore gas fields discovered in the region such as Aphrodite and Calypso in Cypriot waters, Israel's Leviathan and Tamar, and Egypt's Zohr.

By the end of the year, the governments of Italy, Greece, Cyprus and Israel are expected to sign a multilateral agreement to build the EastMed pipeline, which promises to bring a natural gas bonanza to Europe. Russia is currently the largest single provider of gas to the EU, and supplies from the Eastern Mediterranean basin are seen as a viable alternative to state-owned Russian gas monopoly Gazprom. Currently, Russia accounts for around 40 percent of the European bloc's natural gas imports.

The planned EastMed gas corridor is projected to cost $7 billion and is backed by the European Commission. It is designed to initially transport 10 billion cubic meters (bcm) of gas per year from offshore reserves in Cyprus and Israel to Greece and, thanks to its connection with the planned Poseidon pipeline, onward to southern Italy.

Yet, critics say the project is too expensive and faces serious technical challenges. Furthermore, EastMed is opposed by Turkey, which has territorial disputes with the internationally-recognized Cypriot government in Nicosia, including competing claims to waters around the island.

For their part, the Egyptians emphasize that the EastMed initiative is still in the feasibility study stage—a process that will take a couple of years to be completed—and note that Egypt could re-export the region's natural gas to Europe now by using underutilized Egyptian gas liquefaction plants, more quickly and at a lower cost.

Indeed, Egypt is already moving in that direction. A new conduit will deliver natural gas from Cyprus' Aphrodite field to Egyptian territory. Some experts argue the Cyprus–Egypt pipeline puts the EastMed corridor at risk because the latter needs all Cypriot gas to be commercially feasible.

Interestingly, Italian Deputy Prime Minister Matteo Salvini, the kingmaker in Italy's fractured coalition government led by the anti-establishment Five Star Movement and the nationalist League party, is a supporter of the EastMed gas pipeline. Salvini's Russia-friendly League is also endorsing the completion of the Trans-Adriatic Pipeline (TAP), which the Five Star Movement has tried to block by raising environmental concerns (see EDM, November 5, 2018). TAP is the westernmost section of the EU-supported Southern Gas Corridor (SGC), a planned system of conduits to carry natural gas from the Azerbaijani Shah Deniz gas field to Italy, via Georgia, Turkey, Greece and Albania. TAP is designed to pipe 10 bcm of Azerbaijani gas to Europe by 2020, with the target of doubling supplies in the following years.

The EU aims to diversify gas imports away from Russia with the help of EastMed and TAP, in addition to other energy transit projects. In this respect, Italy's support for the two gas pipelines could be a source of friction between Salvini and

the Kremlin, whose relations are reportedly close. A recent journalistic investigation claims that an aide to Salvini negotiated with the Kremlin to secure Russian funding for the League's European Parliament election campaign.

But other issues risk damaging the relationship between the Italian leader and Moscow. Salvini has so far done nothing to cancel or ease economic and financial sanctions that the EU leveled against Russia in response to its annexation of Ukraine's Crimea in 2014 and armed intrusion into Donbas. Salvini promised to do so last spring, after his rise to power.

The Italian deputy prime minister is also trying to build a political axis in the European Parliament with right-winger Jarosław Kaczyński, the leader of Poland's ruling Law and Justice party, who is a staunch critic of Putin's Russia. Moreover, in sync with the United States, Salvini has expressed support for the interim government of self-declared President Juan Guaidò in Venezuela, who is challenging embattled de facto President Nicolás Maduro, an ally of Russia in Latin America.

Moscow has been publicly silent on Salvini's recent moves and declarations, especially as far as natural gas exploitation in the Eastern Mediterranean is concerned. Russian leaders continue to say that their gas is cheaper for European consumers than other sources, and Europe may need new imports by 2030 because of falling production at home (RT, February 28, 2019; TASS, August 2, 2018). Nevertheless, Italy wants to diversify gas suppliers and become a gas hub in southern Europe, be it through the EastMed pipeline or Egypt's shipments of liquefied natural gas (LNG).

Italian state-owned oil and gas producer ENI, the leading company in the exploitation of the Zohr supergiant gas field, has already advanced the idea of turning Egypt into a hub to pipe local, Israeli and Cypriot gas to Europe (see EDM, April

10, 2018). The Kremlin has had to walk a fine line with regard to ENI's strategies in the region, given that Russia's Rosneft has a 30 percent stake in the Shorouk concession, where the Zohr gas field is located.

As Italy seeks to raise its energy profile, it is also aligned with the US and some countries in Central Eastern Europe against Nord Stream Two, the pipeline project designed to double the preexisting natural gas conduit that runs under the Baltic Sea and links Russia to Germany (see EDM, November 5, 2018). The capacity of Nord Stream One stands at 55 bcm, and Russia's state-run gas monopoly Gazprom wants to complete the parallel Nord Stream Two by the end of 2019.

Salvini has built his political brand on the promise to protect Italy's national interest. If this collides with Putin's geopolitical plans, the leader of the League will not hesitate to go against his Russian "friend."

*Emanuele Scimia*

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# Things Are About to Change: Oil and Gas Have Been Found in the Eastern Mediterranean

Large quantities of oil and natural gas have been discovered in the East Med and the race to extract them has begun. These hydrocarbon finds hold the potential to build regional stability and to bolster the economies of important US allies and partners, all of which is in the interest of the United States. But these discoveries could just as easily stoke further instability and conflict if nations default to historic resentments and if regional powers jockey to monopolize on or block access to this strategic treasure.

Extending from Israel and Egypt in the East and South to Turkey, Greece and Italy in the North and West, the Eastern Mediterranean has long been an economically dynamic and politically important region for the United States and its NATO allies. It is about to become even more important.

Large quantities of oil and natural gas have been discovered in the East Med and the race to extract them has begun. These hydrocarbon finds hold the potential to build regional stability and to bolster the economies of important U.S. allies and partners, all of which is in the interest of

the United States. But these discoveries could just as easily stoke further instability and conflict if nations default to historic resentments and if regional powers jockey to monopolize on or block access to this strategic treasure.

There are some early signs of cooperation, and these should be welcomed. States which acutely stand to benefit from the finds—Greece, Cyprus, Israel, and Egypt—have begun working toward a solution and have discussed various export options. The first-everregional gas forum was held Jan 14, 2019, in Cairo, with these Eastern Mediterranean Gas (EMG) pipeline participating countries, along with Jordan, Italy and the Palestinian Authority. The meeting discussed the future of the EMG pipeline and the potential of Egypt as a regional gas export hub. Egypt owns robust domestic energy infrastructural facilities in the Nile Delta—including two LNG plants (sitting idle) and pipeline infrastructure for easy connection to the newly discovered hydrocarbons in the East Med for turnkey distribution to LNG markets in Africa, Israel and the Middle East.

The European Union, too, thinks the new gas and potential oil discoveries in the East Med could strengthen regional energy cooperation, aid overall regional political stability, and spur economic growth in important European economies such as Italy and Greece. A proposed EMG pipeline costing $7 billion and opening in the mid-2020s is a beacon of hope for the European Union to increase energy diversification, bring billions of dollars of lifetime revenues to southern Europe and curtailing Russia’s dominance over the European energy market.

Yet even with this early cooperation, the role of U.S. and NATO naval forces as a diplomatic and economic actor in U.S. foreign policy and execution has never been more important in the Eastern Med. The discovery of hydrocarbons in the East Med has initiated historical interest and possible shifts in the global balance of power in a region already full of ongoing

tensions.

I have completed multiple tours in the region, with my last being as a Sixth Fleet Air Operation Officer, where I navigated firsthand the multiple lines of conflict. These conflicts, some fought in the open and others simmering beneath the surface, include disputes between Turkey and Israel, between Egypt and Turkey, between Turkey and Greece over territory and the Cyprus issue, and among Israel and its Arab neighbors, just to name a few. From my experience it is difficult to imagine an easy way forward as these conflicts continue to plague the region and make exploitation of the East Med natural resources a geopolitical issue.

Enter the United States. "The role of the U.S. Navy as a diplomatic and economic actor in US foreign policy and execution is as strong as ever and likely to remain so for the next several decades," said the Chief of Naval Operations, Admiral John Richardson, in February. Nowhere else do these words ring truer than in the Eastern Med, where stability and economic prosperity are at the cusp. Nowhere do risks to United States, NATO and its allies have more facets and come from more directions than in the Mediterranean region. Well-positioned naval forces have the flexibility to respond to any crisis that may arise in the region quickly and authoritatively all while creating stability through consistent presence.

It makes economic sense for the United States and NATO to deploy naval forces to the Eastern Med where four of the five major threats, to the United States and its allies, mentioned in the National Defense Strategy can be confronted while at the same time effecting a top economic and geopolitical priority. The security and prosperity of the European Union, specifically among its southern nations, depend on anticipating, containing, and reducing risks in the Mediterranean region by consistent presence. The United States and NATO must get ahead of adversaries in the region and have

them react to Western moves rather than the West continue to react to the actions of its adversaries.

Diplomatic and economic functions of naval forces while conducting exercises with allies in the region should be the primary instruments in this effort, but hard power also has its role, especially when risks turn to threats and threats turn to violence. After all, there is still something to gunship diplomacy.

Even with U.S. presence, however, there must be a concerted effort. Egypt has established cooperation agreements with Israel, Cyprus and Greece. The four nations have made efforts that seek to enhance civil and military activities, including joint military drills to bolster interoperability and cooperation, and ultimately stability in the nations' energy sectors. U.S. and NATO forces must look for opportunities to join in these joint exercises.
Yet the discovery of these sizeable amounts of hydrocarbons has not only attracted the attention of the West, but also that of other nations worried about the potential effects on the region's current power balance. Turkey, Russia, Iran and even China are attempting to gain geopolitical influence in this critical and distinct region.

The Eastern Med bustles with age-old local disputes that are territorial, ethnic and religious in origin. Turkey has opposed extraction activities off the coast of Cyprus and has threatened to blacklist major firms that take part in the extraction and exploration operations. Turkey not only challenged Greece and Cyprus over the ownership of the natural resources discovered in the region, but also has begun seismic and drilling activities in Cyprus' UN recognized, exclusive economic zone. Furthermore, Turkey has enhanced cooperation with Iran –the two nations have established a comprehensive pipeline network to bring gas to the European markets. Both countries have been negotiating additional projects in the region, and now worry that an EMG pipeline will disrupt their efforts. Iran is trying to establish a foothold in Syria to ensure a post-conflict land bridge to the Eastern Med, further

increasing its relevance in energy geopolitics and threat to Israel. Russia increasingly wants to be viewed as a respected global power in the region. It has established bases in Syria and has increased its military presence in the Eastern Med. Now it looks to have a say in the East Med and maintain its dominant stand in the global gas market. Finally, China is investing heavily in the East Med, as it views the East Med region as the western end of its Belt and Road Initiative and entry point to the European Market.
In the end, the exploitation of the East Med resources will require a stable region bolstered by U.S. and NATO alliance support that includes naval forces for diplomacy, open economic sea lanes and poised hard power.

*Commander Tony Chavez is a navy federal executive fellow at the Chicago Council on Global Affairs. A decorated navy aviator, Commander Chavez has served in every U.S. Navy fleet throughout the globe.*

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# US’ ExxonMobil plans more drilling in the Eastern Mediterranean after recent gas discovery

Two weeks after announcing it had made the world's third largest natural gas discovery in the last two years off the coast of Cyprus island, U.S. energy giant ExxonMobil is now working on projects to commercialize its gas reserves and also planning to drill more exploration wells around the island, according to Stephen Greenlee, the president of ExxonMobil exploration company and vice president of the ExxonMobil corporation.

Greenlee's comments came at CERAWeek by IHS Markit, the world's largest energy conference bringing together industry leaders in Houston.

"We have obviously just announced the discovery and we are currently working on the size of it, trying to understand the most commercial vehicle to commercialize the reserves," Greenlee told the Daily Sabah on the sidelines of the event.

Greenlee also confirmed that the company will be looking into more drilling opportunities in the region while also being engaged in projects to monetize the Glaucus-1 reserves in the most lucrative way.

The ExxonMobil discovery, announced by the Greek Cypriot administration's Energy Minister Georgios Lakkotrypis, was

made in the second well of the company, Glaucus-1, located in the putative Block 10 in the exclusive economic zone unilaterally declared by the Greek side. The Glaucus-1 is estimated to contain 5-8 trillion cubic feets of gas (142 to 227 billion cubic meters).

Greenlee previously said the gas discovery was an encouraging result in a frontier exploration area. “The potential for this newly discovered resource to serve as an energy source for regional and global markets will be evaluated further.”

Last year, Italy’s ENI and France’s Total said they had found a promising prospect of natural gas in a nearby concession, Calypso, located on Block 6 of the Greek administration’s unilaterally declared Exclusive Economic Zone (EEZ).

The consortium of ExxonMobil and Qatar Petroleum started drilling in Block 10 in November 2018.

The Greek Cypriot government has not yet commercialized any gas discovery with a huge political problem waiting to be resolved in the island as well as a lack of infrastructure to process and utilize the gas. It has one gas field, Aphrodite, which contains an estimated 4 trillion cubic feets of gas discovered to the south of the island in 2011.

In response to the infrastructure problem, the Greek Cypriot government launched a tender for a liquefied natural gas (LNG) facility to be constructed by November 2020. The facility will be capable of unloading LNG from LNG carriers ranging in size from 120,000 cubic meters to 217,000 cubic meters.

Greenlee refrained from commenting on the political conundrum in the island which has been an impediment to the equitable share of resources between the Turkish and Greek communities on the island. “It is an issue between the governments to resolve,” he said and did not comment on any future interaction between the two sides.

ExxonMobil’s Greenlee also suggested that ExxonMobil is open to joint drilling with other countries in the region, including Turkey, if the data allows and the opportunity rises.

Turkey has also accelerated its seismic survey and drilling activities in the Eastern Mediterranean in the last five years. The country’s seismic vessel Barbaros Hayreddin has been conducting surveys in the region since 2013 after an agreement with the Turkish Cypriot government was signed in 2011, which gives Turkey exploration rights for 30 years. Its first drillship Fatih also started operations with deepwater well-drilling in October 2018 off Alanya, a district in the Mediterranean province of Antalya.

The island of Cyprus has been divided since 1974, when a Greek Cypriot coup took place after decades of violence against the island’s Turkish community and Ankara’s intervention as a guarantor power. The status of the island remains unresolved in spite of years-long negotiations.

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# Flexible renewable power: Spain to triple solar thermal capacity by 2030

**Spain's** NECP has been approved by the **Spanish Council of Ministers** and submitted to the **European Commission**. ESTELA, the representative association of the **European Solar Thermal Electricity sector** (also known as concentrated solar power), highlights that the plan includes a proposed **increase in installed capacity of solar thermal electricity from 2,300 MW to 7,303 MW by 2030**.

This development in Spain is a strong signal that the value of solar thermal electricity is now recognised when forecasting the future energy generation mix. The additional 5 GW of latest-spec solar thermal power plants, **with much larger storage volumes**, will capture, store and subsequently generate electricity, mostly in a complementary way to photovoltaic and/or wind generation, contributing to the stability of the grid.

With 2.3 GW installed capacity currently, Spain is the global leader in STE technology. However, with threefold growth over the next 10 years, the European STE/CSP industry could substantially strengthen that leadership, reaching into world markets whilst maintaining its excellence in research and innovation activities.

More STE/CSP in Europe means the technology could (already today) provide a substantial contribution to the required flexibility for a further increase of solar PV and wind

generation towards decarbonisation – without waiting for industrial maturity of other technologies that are currently unable to deliver bulk amounts of CO2-free dispatchable energy.

As with other green technologies, STE/CSP offers deep and long-lasting benefits to the future economy and job markets as part of a Just Transition. The deployment of solar thermal power plants should have an immediate, positive macroeconomic effect on GDP and stimulate employment for all European countries involved along the STE/CSP value chain following investment in related equipment, components, and services.

Granting solar thermal power plants a more significant role over the next decade will ease the necessary phasing-out of coal and nuclear power plants. **The proven competitiveness of solar thermal power plants against fossil backup technologies** and the ability of this technology to provide the basic services of conventional power plants will lead to a zero-emission generation fleet – combined with the other already established intermittent renewables, especially in sunny European countries.

# Rolling out STE across Southern Europe for the benefit of the whole EU electricity system

STE provides the possibility of moving towards an efficient share of flexible and non-flexible renewable generation across Europe but requires a clear endorsement by the European Commission coupled with practical help.

The justifications are clear

- Leaving the completion of the 2020 and 2030 objectives to a purely market-driven process will lead to a further increase of non-flexible RES in Europe (essentially wind

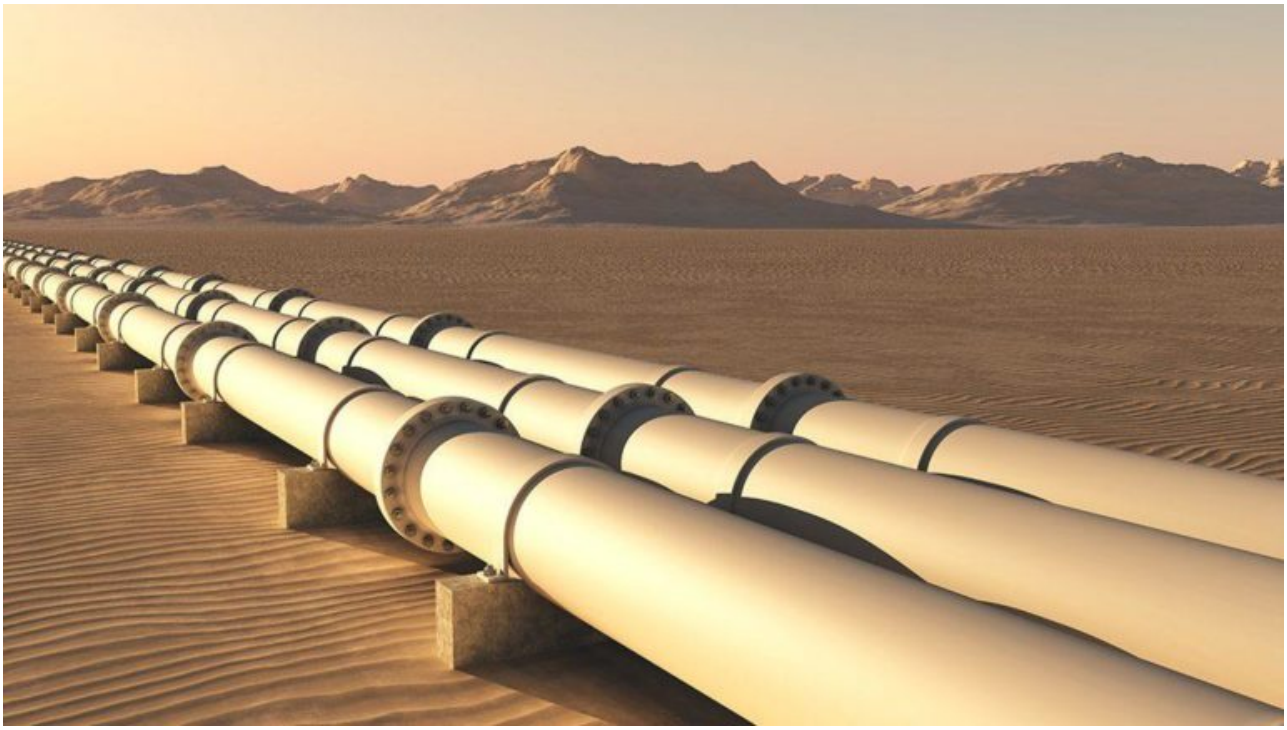
and PV);

- At the horizon **2030 and beyond**, a more balanced share between flexible and non-flexible RES will be vital to ensure the reliability in a decarbonised European power system which is required to address the foreseen lack of flexible power generation overall;
- Expensive backup capacity from conventional power plants can be avoided if flexible RES (STE/CSP) is properly and adequately implemented from now on where **fossil back up capacities should be considered part of the costs of non-flexible RES**;
- Support for this program should be the product of a well-coordinated (at EC level) combination of sources: Directives, strategic energy security investments, cohesion funds, development and cooperation (including outside EU);

These issues were already identified in the 2014 IEA Technology Roadmap – Solar Thermal Electricity report that foresees **4% of the whole installed capacity by 2050 for Europe coming from STE/CSP**. That would mean that an additional 1 GW/year capacity in STE would need to be installed in total in Europe between 2015 and 2030.

**ESTELA President Dr. Luis Crespo** calls for EU institutions and, most importantly, other EU Member States getting behind their 2020 RES objectives, to take this example from Spain as an opportunity to consider again the role of STE/CSP in their strategies. This, he points out, would be in keeping with the RES Directive (recast to 2030) entering into force in 2021 which calls for proactive cooperation between Member States for the development of cross-border projects.

# Egypt’s gas production to increase to 7bn scf/day next June



(MENAFN – Daily News Egypt) The Ministry of Petroleum aims to increase Egypt’s natural gas production to 7bn cubic feet daily (scf/day) by June, compared to the current production of 6.8bn scf/day through increasing gas production from the Zohr field.

A source at EGAS told Daily News Egypt that the increase from Zohr to 2.6bn scf/day compared to 2.3bn scf/day now will compensate for the natural decline rates and increase the total local production.

He pointed out that new projects were connected to production, such as Zohr, Nawras, North Alexandria and 9B, and have contributed to increasing Egypt’s natural gas production.

The source added that it is targeted to increase Egypt’s natural gas production to 7.5bn scf/day in 2019/20.

The local market’s consumption of natural gas is currently dropping to 5.5bn scf/day as a result of the decrease of electricity plants consumption in winter.

Moreover, the source explained that the consumption rates of natural gas in the local market is growing according to the industrial development and urban plan and the increase in the number of cars that operate with natural gas.

The consumption of the electricity sector represents 61% of the total natural gas consumption, while the rest of the sector such as industry, household, and petroleum products consume 39%.

The source said that the local gas consumption rate would increase gradually to 7bn scf/day in the next fiscal year (FY) compared to 6.2bn scf/day this FY.

The average local market consumption of natural gas will increase to 9bn scf/day by FY 2020/21 according to the industrial development plan with the increase of the electric energy produced and delivered to homes, as well as to the largest number possible of cars operating with gas instead of petroleum products.

The Ministry of Petroleum’s plan aims to complete the implementation of Zohr, North Africa and Borollos to contribute to increasing local production and covering consumption rates with the operation of liquefaction factories through the gas comping from Cyprus and Israel.

# Equinor CEO: Energy sector ‘facing a crisis of confidence

he oil and gas sector is “facing a crisis of confidence” and a mounting lack of trust as climate change concerns rise worldwide, the chief executive of Norway’s top energy company said Monday.

Equinor CEO Eldar Sætre said at the CERAWeek by IHS Markit conference in Houston that the environmental issues represent a real threat to the industry unless oil and gas companies proactively step forward to dramatically reduce emissions and pollution.

“We are collectively not doing enough,” Sætre said.

The industry must align to promote more transparency, public engagement and climate change action. Equinor, for instance,

touts having roughly half the carbon dioxide emissions on average as the rest of the oil and gas sector.

Equinor, although still an oil and gas firm, also invests heavily in renewable energy, especially offshore wind farms. In the U.S., Equinor has the Empire Wind farm offshore of New York and is now developing a similar project offshore of Massachusetts.

Sætre also bemoaned a general lack of help coming from governments when it would help if nations would set specific targets on emission reductions and incentives to help get there.

“Politics becomes ever more shortsighted,” he said, “and is increasingly governed by populism.”

*This article first appeared on the Houston Chronicle – an Energy Voice content partner. For more from the Houston Chronicle click here.*

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# Shale on brink of M&A as oil majors flex muscles in Permian

HOUSTON (Bloomberg) — Cowboy boots and turquoise belt buckles are giving way to smart suits and silk ties as the world's biggest shale oil field prepares for mergers.

As oil executives from across the world gather in Houston for the annual CERAWeek by IHS Markit conference, the Permian basin in the U.S. Southwest is on the cusp of a radical transformation with one simple premise: bigger is better. The energy industry appears primed for deals at a time when Big Oil is flexing its muscle in the region.

Just last week, Exxon Mobil Corp. and Chevron Corp. unveiled audacious growth plans for the Permian basin, hitherto the domain of smaller rivals. Royal Dutch Shell Plc is said to be on the prowl for deals while BP Plc bought in last year.

Meanwhile, independents are under increasing investor pressure to merge or sell out in an effort to end relentless production growth that has burned through some $200 billion over the past eight years. "The ability of the larger companies to do an accretive acquisition is probably at its highest level since

the beginning of the shale revolution," said Michael Roomberg, a fund manager at Miller/Howard Investments Inc. which manages $5 billion. "M&A interest is at its highest in nearly a decade."

But the century-old oilfield cycle of big players swallowing up smaller ones may not happen quickly or follow the conventional path.

The supermajors, facing investor pressures of their own, are unwilling to throw cash around like they did in the heady days of $100-a-bbl oil. All-stock deals could be dilutive because many U.S. independents trade at higher price-to-earnings multiples than integrated oil companies, according to data compiled by Bloomberg.

Diamondback Energy Inc. and Concho Resources Inc. pulled off all-stock deals that together were worth almost $20 billion last year, showing a willingness to merge their way to gain scale.

Pressure has mounted on Permian-only and smaller companies in recent weeks. Pioneer Natural Resources Co. and Halcon Resources Corp. replaced their CEOs while names such as Alta Mesa Resources Inc., Centennial Resource Development Inc., and Laredo Petroleum Inc. have seen their market values decimated.

There are 112 operators in the Permian basin and that means an excessive number of management teams operating similar assets, said Ben Dell, founder of activist investor Kimmeridge Energy Management Co. Economies of scale are needed and about 20 companies, or any valued under $3 billion, should be combined in a "merger of equals," he said.

Independents were once the innovators that worked out how to pump oil from previously impermeable shale formations. That turned the U.S. from a petroleum importer dependent on the Middle East into a global energy superpower. America's record production has prompted OPEC to take measures intended to

forestall a glut. Saudi Arabia plans to extend deeper-than-agreed supply curbs into April, a Saudi official familiar with the policy said yesterday.

For North American oil companies, the shale revolution came at a cost. Excluding the integrated majors, explorers spent $200 billion over the last eight years, according to data compiled by Bloomberg. Investors have signaled they've had enough. They want a manufacturing-style production mode, which favors the biggest, most efficient operators.

Exxon Chief Executive Officer Darren Woods was blunt in his assessment of how the supermajor will meet its Permian target of 1 MMbpd by 2024 — more than OPEC member Libya's entire output. "We're changing how the game gets played," he said.

Exxon and Chevron both emphasized their focus on existing Permian holdings, favoring small land swaps rather than big corporate deals.

But the European supermajors, playing catch-up, appear to be willing to play the acquisition game. BP Plc entered the fray last year with its $10.5 billion purchase of BHP Billiton Ltd.'s onshore assets and Shell is said to be interested in buying Endeavor Energy Resources LP, one of the Permian Basin's largest private operators, for as much as $8 billion.

The arrival of Big Oil may change the region's Wild West image. Until now, the barrier of entry has been low, with dozens of private equity-backed wildcatters, many of whom are in their early 30s, flipping leases and drilling exploratory wells with the aim of selling them to the highest bidder.

It's a far cry from Exxon's systematic approach, perhaps a sign that the days of the rags-to-riches wildcatters may be ending.

# Norway divestment affects wide array of oil explorers

## Selling Out

These are the 10 largest shareholdings affected by Norway's decision

| Company | Value of Holding | Percentage Stake | Country |
|---|---|---|---|
| EOG Resources Inc | $488m | 1.0 | United States |
| Reliance Industries Ltd | 485 | 0.5 | India |
| Occidental Petroleum Corp | 456 | 1.0 | United States |
| Valero Energy Corp | 336 | 1.1 | United States |
| CNOOC Ltd | 330 | 0.5 | China |
| Woodside Petroleum Ltd | 288 | 1.4 | Australia |
| Canadian Natural Resources Ltd | 278 | 1.0 | Canada |
| Anadarko Petroleum Corp | 238 | 1.1 | United States |
| PTT PCL | 216 | 0.5 | Thailand |
| Concho Resources Inc | 162 | 0.8 | United States |

Source: Norges Bank

Bloomberg

The decision by the world's biggest sovereign wealth fund to sell some of its energy holdings encompasses a vast array of companies, from US shale drillers and developers of Canadian oil sands, to off shore drillers from Africa to China. Norway's $1tn investment fund said on Friday that it will gradually sell its holdings in oil and gas exploration and production companies in order to reduce the country's exposure to a permanent decline in crude prices. That's a smaller step than the full fossil-fuel divestment that some were proposing, but still aff ects some of the industry's most famous names. Houston-based shale driller EOG Resources Inc is the biggest shareholding to be sold, with a total value $488mn, or just under 1% of the company, according to the fund's website. Indian petroleum and chemicals giant Reliance Industries Ltd

is the next largest, with a stake of 0.5% worth $485mn. Other notable US names include Anadarko Petroleum Corp, Apache Corp and Occidental Petroleum Corp On the other side of the Atlantic, explorers Tullow Oil Plc and Premier Oil Plc are aff ected. All of them appear on a list of 134 companies placed in the exploration and production category FTSE Russell. The stocks will be “phased out from the fund gradually over time,” according to Norway’s finance ministry, which may prevent the sale causing any big changes in these companies’ market values. But the move also raises questions about the industry’s appeal to investors in the very long term. “The Norwegian sovereign wealth fund is seen as something of a poster-child amongst sovereign wealth funds,” said Alejandro DeMichelis, director of oil and gas research at Hannam & Partners LLP. “This decision could also trigger other large investors to review their stance toward investing in the oil and gas sector.” Life is changing for oil companies. Ten years ago, they accounted for about 15% of the S&P 500 index. Today, they make up just 5%, having been mostly displaced by technology giants such as Facebook Inc and Apple Inc. Driving this shift is a smorgasbord of new energy sources that’s bringing unprecedented competition for capital. Consumer choices are set to drift farther from the hydrocarbons of the 20th century, with renewables potentially meeting about a quarter of demand by 2040, according to oil major BP Plc. It’s no surprise, then, that investors are increasingly questioning the wisdom of betting on oil. A divestment campaign started by activist group 350.org in 2012 has already persuaded funds holding $8tn to back away from fossil fuels, according to its website. Scrutiny could intensify as AGM season approaches. Catherine Howarth, chief executive off icer of ShareAction – a group that has targeted Royal Dutch Shell Plc in the past – said she expects a “ramp-up” of pressure at annual general meetings that start in the spring.