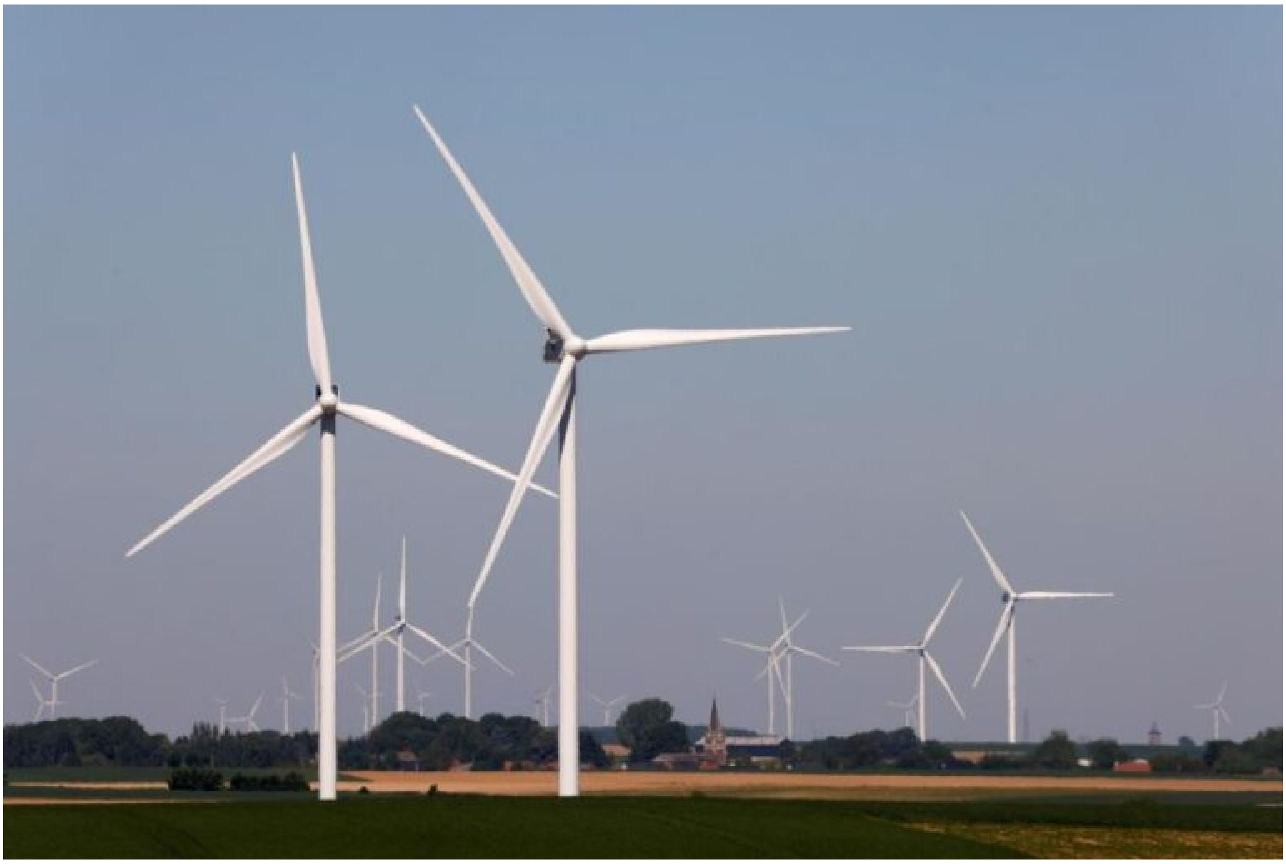
Renewables boom unleashes war over talent for green jobs



Clean energy giants are finding a shortage of workers with the skills needed to support their ambitious growth plans.

The renewables jobs market is heating up and candidates with the right abilities are becoming harder to find, according to Miguel Stilwell, chief executive officer at Portuguese clean-energy firm EDP Renovaveis SA. The company is one of the world's top installers of green power and plans to hire 1,300 employees over the next two years.

“There's a war over talent globally,” Stilwell said in an interview on May 28. “The renewable sector, given the massive amount of growth that is expected, doesn't have enough people.”

As countries funnel billions of dollars into developing renewable power, policymakers are banking on the sector to create new jobs that are crucial for the post-pandemic economic recovery. Solar generation capacity is expected to triple by the end of the decade, while wind capacity is expected to more than double over the same period, according to clean energy research group BloombergNEF.

Green supermajors such as NextEra Energy Inc, Iberdrola SA, Enel SpA and EDP are leading the race to electrify the global economy. But some large oil companies are starting to get into the sector too, with BP Plc announcing last month it’s looking to fill 100 offshore-wind jobs in the U.K. and the U.S., a figure that could double by the end of the year.

Engineering skills such as energy assessment, project management and project design are in high demand, EDP’s Stilwell said. Good business developers who understand clean energy technologies are also a scarce resource. Other roles, such as managing mergers and acquisitions, or back office tasks, can easily be hired from other industries.

“We’re having to bring in people from other sectors, whether it’s oil and gas or other parts of the energy industry, or recruiting directly from universities,” Stilwell said. “There’s a lot of competition out there.”

Engineering and chemistry graduates working on a masters degrees in renewables at the Universitat Politecnica de Catalunya in Barcelona are often hired while they’re still in school, or right after they finish, according to Professor Jordi Llorca. The university has partnerships with other colleges in Europe and students often get hired to work in other countries like the U.K. or Denmark, said Llorca, who is also the director of an engineering research center at the university.

“We need to be fast to adapt the contents of our programs on the energy transition and renewable energies to make sure our graduates are competitive in the market,” Llorca said. “We’re constantly looking at the contracts and agreements we have with different industries to see what's needed."

The university launched a masters in hydrogen energy last year after professors realized very few people have the skills in mechanics and chemistry that the fast-growing sector will need very soon. "There's always a moment of vacuum whenever a new technology comes in, but we're able to put together new programs in just a few months."

Offshore wind farms are another growth area. The projects involve erecting and maintaining wind turbines the size of skyscrapers miles out to sea. A single turn of one of the massive blades could power a house for two days. The industry was pioneered in Europe, but is now rapidly expanding to Asia and the east coast of the U.S.

Those new markets don't have people with experience. That means that developers are often sending British and European employees to lead the way, according to Clint Harrison, director at renewable energy-focused recruitment firm Taylor Hopkinson. But as business takes off there's pressure to hire locally.

The limits of a well-trained workforce could end up being a bottleneck in an industry that is key to slashing emissions.

"There's a sense of urgency," Harrison said. "The market is growing very, very quickly and we need to ensure we have the right people across various projects and regions to ensure projects move forward and aren't delayed."

In the U.K. alone, around 200,000 skilled workers will be needed in the offshore energy sector by 2030, up from 160,000 today, according to a recent report by the Robert Gordon University in Aberdeen. About half the jobs are expected to be filled by people transferring from the oil and gas sector and about 90% of current workers in the fossil-fuel sector can be retrained for renewables, said author Paul de Leeuw.

“Demand for courses on renewable energy and the energy transition is ramping up rapidly and at the same time we see demand for oil courses declining,” he said. “It’s a societal and industry shift mirroring in the education system.”

Engine No. 1 converts tiny ExxonMobil stake into big win

NEW YORK: ExxonMobil has spent more than two decades sparring with activists over climate change, turning back virtually every shareholder challenge at its annual meeting each spring.

But late last month, the oil giant, which has shunned renewable energy investments embraced by some rivals, suffered a landmark defeat when upstart investment fund Engine No.1 successfully won election of three of its four board candidates, overcoming fierce campaigning from management.

A newly formed San Francisco-based investment group, Engine No.1 is a relative minnow in the world of finance, but now stands poised to steer the iconic US petroleum heavyweight in a new direction.

Its victory points to the increased vulnerability of incumbent energy players to insurgent investors as public concern mounts over climate change.

Engine No. 1’s stake in ExxonMobil amounts to 0.02 percent of total shares, a pittance that may have led the Texas company to underestimate the broader investor frustration it faces after it was kicked out of the prestigious Dow index last year.

“It’s ironic that an entity with such a small stake was able to effect such change,” said CFRA Research analyst Stewart Glickman, who noted that BlackRock and other funds with large stakes sided with Engine No.1 and played a critical role in its victory.

“They used institutional investors that are more climate change-focused to get this done,” Glickman added.

Andrew Logan, a veteran of shareholder campaigns at ExxonMobil as director of the oil and gas program at activist investor group Ceres, said Engine No.1 ‘s newness was an advantage.

“With Exxon, everyone has a history,” Logan said. “Having a new face without that baggage led them to open doors.”

Engine No. 1’s board nominees were not environmentalists, but longtime corporate executives with energy industry experience. The group was skillful in tying ExxonMobil’s carbon policy to a broader corporate strategy that struck investors as out-of-touch, Logan said.

Engine No. 1 “struck a powerful balance of nodding to climate change, but they focused on the core issue of Exxon’s capital plan and its strategy,” he said.

— Arguing for diversification —

Named for San Francisco’s first firehouse, Engine No. 1 was founded last year by Christopher James, a wealthy technology investor.

Another key player in the ExxonMobil campaign was Charlie Penner, a former partner with activist hedge fund Janus who is well known to key asset managers.

The firm currently has $240 million under management and just 22 employees, according to a securities filing.

Neither James nor Penner were available for an interview, but Engine No. 1 pointed AFP to earlier statements that criticized ExxonMobil’s investments on low-return petroleum projects and its lack of a plan in case government climate mitigation policies are accelerated.

ExxonMobil should “seriously explore opportunities to profitably diversify… with the assistance of new directors with notable track records of agile and adaptative innovation in energy,” Engine No. 1 said in its initial letter to the company.

The three nominees elected by ExxonMobil shareholders are Gregory Goff, the former chief executive of refiner Andeavor; Kaisa Hietala, a former Neste executive who oversaw the company’s expansion into renewable fuel; and Alexander Karsner, a strategist at Alphabet’s X innovation lab and a former US assistant energy secretary.

Anders Runevad, former chief executive of Vestas Wind Systems, was not elected.

ExxonMobil deemed that none of Engine No. 1’s nominees “meet the standards or needs of the company’s board,” according to a securities document. The board named two other candidates, who were elected last week by shareholders, along with the three

Engine No. 1 candidates and seven other incumbents.

Engine No. 1 noted during the campaign that ExxonMobil did not meet with its nominees, and said the company’s picks lack a “diverse track record of success in the energy industry who can position the company for success in a changing world.”

— What will change? —

ExxonMobil has changed its tone since Engine No. 1’s victories, saying, “We welcome the new directors to the board and look forward to working with them constructively and collectively to benefit all shareholders.”

Only time will tell exactly how much the company shifts course and whether it will follow other oil majors into renewable energy, focus on executing long-discussed efforts at carbon capture, or go in a different direction.

The vote “means the status quo is no longer acceptable,” said Dan Pickering, founder of Pickering Energy Partners in Houston. “The net impact is more of their capital is directed at energy transition or carbon abatement of some sort and less goes to the oil and gas business.”

BLUE ECONOMY IN THE MEDITERRANEAN

ATHENS, Greece: Mediterranean countries should be among the biggest winners in the transition from fossil fuels to renewables, an energy expert told a key policy conference on Wednesday.

“Here in the Mediterranean region, the post-carbon era actually holds enormous opportunities in terms of the Blue Economy,” industry veteran Roudi Baroudi told the virtual All Things Energy Forum. He added that while conventional wind and solar would “have a key role to play,” the proximity of the sea offered a whole other dimension.

“There are other promising energy technologies too, including rain, wave, and tidal power, as well as undersea geothermal,” said Baroudi, who has advised governments, multilateral institutions, and major international companies on energy policy. “Some of the most promising replacements for fossil fuels are waiting out at sea, if only we have the wisdom and the foresight to develop them.”

The very proximity of a large sea like the Mediterranean gives its coastal states key advantages over landlocked counterparts, he explained, because they have many more options for low- or no-carbon power generation. The 40-year veteran of the regional energy scene predicted that with strong leadership, regional countries could use this potential to fully electrify all of their populated areas.

“That kind of access [to electricity] is a key requirement for the kind of economic growth that would lift millions of people – even tens of millions – out of poverty,” he stated. “It also would reduce the flow of African migrants bound for Europe by generating new economic opportunities for them at home.”

Baroudi cautioned, however, that significant hurdles remained if the region was to realize its full potential for offshore energy production, mainly because about half of the Mediterranean’s maritime boundaries remain undefined.

As with the prospects for offshore natural gas, he explained, investors avoid such unsettled borders because contested ownership of an area and/or resource poses too great a risk. For this reason, he said, and because pressure is building for a moratorium on developing new oil and gas fields, regional countries needed to embrace diplomacy and hammer out treaties that define their respective Exclusive Economic Zones. Since gas is expected to remain a key transition fuel for at least a couple of decades, he explained, regional countries could also earn billions in revenues from offshore deposits – but some still need EEZ deals to get started.

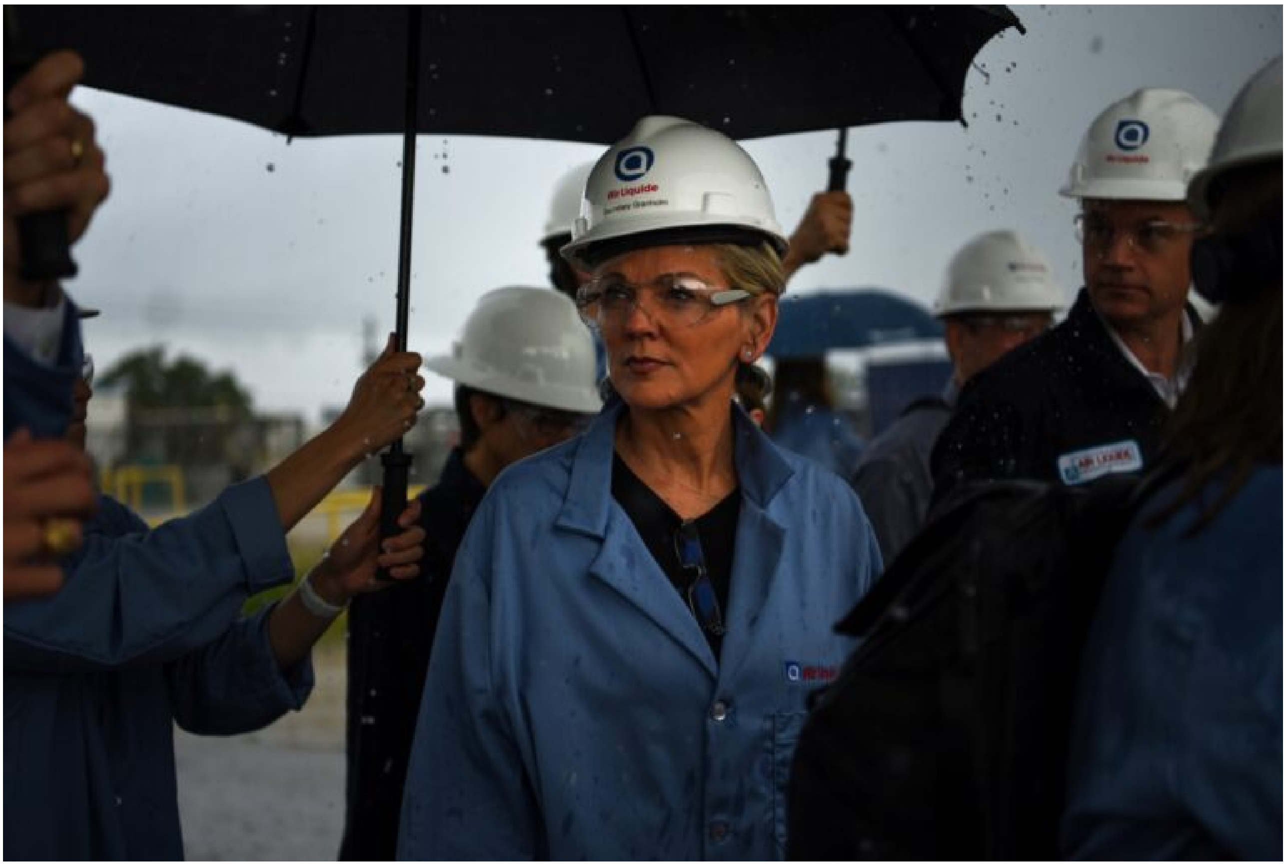
“No need is more pressing, especially since the dialogue and compromises required would not only open up gas development, but also lay the groundwork for closer cooperation in other fields – which is exactly what the Blue Economy demands in order to realize its full potential,” said Baroudi, who currently serves as CEO of Energy and Environment Holding, an independent consultancy in Doha.

“As a bonus, a calmer, friendlier Mediterranean would also allow the sharing of responsibilities and the pooling of resources and data, which would significantly improve outcomes in everything from immigration, weather forecasting, and search and rescue to tsunami warning systems and protecting communication cables," he said. "Then we could just see the whole Euro-Med region become one of Good Neighbors, a place of mutual goals, settled grievances, and even geostrategic cooperation. Dare I say it, ladies and gentlemen, the Mediterranean could be fully at peace in our lifetimes."

The event, whose speakers included noted academics and senior business and energy leaders, as well as key government ministers, on Wednesday.

Roudi Baroudi has more than 40 years of experience in the energy business and has helped design policy for major international oil companies, sovereign governments, and multilateral institutions. He currently serves as CEO of Energy and Environment Holding an independent consultancy based in Doha, Qatar.

LNG Makers Get Hint to Go Greener From U.S. Energy Secretary



The days of promoting liquefied natural gas as “freedom gas” or “molecules of freedom” have ended at the U.S. Department of Energy.

During a Friday visit to Houston, U.S. Secretary of Energy Jennifer Granholm said the Biden administration would rather promote and sell a cleaner version of the superchilled power plant fuel. The statement marks a policy shift from the Trump administration, which rolled back environmental regulations and heavily promoted U.S. LNG around the world.

The energy industry has been under mounting pressure from investors and governments to step up efforts to reduce greenhouse-gas emissions, with some spectacular victories for activists over Big Oil this week. U.S. LNG makers are seeking to green their image in order to land supply deals with environmentally conscious customers in Europe and Asia.

The Biden administration, Granholm said, is looking closely at carbon capture and sequestration technology, which would take emissions from LNG plants and other facilities, move them by pipeline and then inject them underground.

“We want to be able to promote and sell clean technologies,” Granholm said following a tour at an Air Liquide SA hydrogen plant in La Porte, Texas. “That could be natural gas that has been decarbonized, or that could be natural gas where the methane flaring has been eliminated.”

Houston-based Cheniere Energy Inc., the largest U.S. LNG exporter, recently announced that it would be including carbon emission tags with its cargoes, allowing customers to audit the environmental footprint of a shipment. One of the company’s LNG tankers recently participated in a study analyzing emissions on a roundtrip between Texas and Europe.

Arlington, Virginia-based Venture Global LNG announced Thursday that it plans to implement carbon capture and sequestration at three export terminals in Louisiana, where one is already under construction and expected to produce its first drops of the fuel later this year.

Still seeking to sell enough contracts to support its proposed Rio Grande LNG export terminal in South Texas, Houston-based LNG developer NextDecade Corp. has also pledged to add carbon capture and storage to its plant.

Exxon Mobil’s last-ditch attempt to stave off a climate vote coup

It was a stunning moment for Exxon Mobil Corp and the wider corporate world: a tiny activist fund had succeeded in changing the company’s board.

But in the hours leading up to this week’s annual shareholders meeting, Exxon went to extraordinary lengths to head off the threat from a campaign about which it had been largely dismissive months earlier.

Exxon telephoned investors the morning of the ballot – and even during an unscheduled, hour-long pause during the virtual meeting – asking them to reconsider their votes, according to several of those who received calls.

Some said they found the last-ditch outreach and halt to the meeting unorthodox and troubling.

“It was a very unusual annual general meeting,” said Aeisha Mastagni, a fund manager at the California State Teachers’ Retirement System, a major Exxon investor that backed the activist campaign from the beginning. “It didn’t feel good as an investor.”

The May 26 meeting concluded with Exxon stating that two of the dissident’s four director nominees had been elected, a coup for Engine No 1, a little-known investment firm calling for the company overhaul its strategy, cut costs and come up with a plan to address climate change.

Its victory is widely seen as a warning to the rest of the industry that investors will now hold energy companies to account for environmental concerns.

The full results of the vote still haven’t been disclosed; a third Engine No 1 nominee is still in the running to fill one of the two remaining board seats.

While there’s no suggestion Exxon broke any rules during

Wednesday’s meeting, such tactics are unusual for a blue-chip company.

In response to questions about the meeting, the company said it’s been “actively engaged” with investors and welcomes the newly elected directors.

Net Zero Exxon opposed Engine No 1 from the outset.

The fund holds a stake in Exxon of just 0.02%, valued at about $54mn.

The oil company described the fund’s four candidates as unqualified and said its proposals would imperil Exxon’s dividend.

Still, the company made a concession in March to another investor, D.E. Shaw & Co, appointing two new directors, including activist investor Jeff Ubben.

But Exxon still refused to meet with the Engine No 1 candidates.

A significant hurdle faced by the company was winning support of large institutions including its top three investors, Vanguard Group Inc, BlackRock Inc
and State Street Corp, which collectively hold a stake of more than 21%. BlackRock has been vocal about its voting guidelines on climate change.

Discussions with many large investors in the run-up to the vote were primarily focused on Exxon’s strategy to get to net zero emissions by 2050, and not the company’s financial performance, according to people familiar with the talks.

Chief Executive Officer Darren Woods got down in the trenches during the proxy fight and made commitments to keeping the dialog going after the meeting, the people said.

But Vanguard, BlackRock and State Street ultimately supported a partial slate of nominees from Engine No 1. An indication the fight might be tilting in Engine No 1’s favour came mid-May with the partial backing from two leading proxy advisory firms.

Two days before the vote, Exxon said it would appoint two new directors, one with “climate experience” and another with industry expertise.

On the morning of the meeting, Engine No 1 issued a statement alerting shareholders that Exxon may try, “in a targeted manner,” to persuade them to change their vote.
Sure enough, by the time the virtual meeting began at 9:30am.
Dallas time, Exxon representatives were ringing investors. In some cases, those calls entailed cajoling holders to at least reduce their support to one or two dissident nominees rather than all four, according to people familiar with the conversations, who asked not to be identified because the discussions were private.
At about 10:15 a.m., investor relations head Stephen Littleton announced proceedings would be paused for 60 minutes, citing the volume of votes still coming in.
As classical music played on the webcast, emails started flying between investors left bewildered by the halt.
One executive at a major Exxon shareholder said they were contacted during this hiatus and pushed to change their vote.
The person, who has decades of experience dealing with boardroom elections, said that while such appeals a day before a vote are commonplace, it was the first time they’d fielded such a request during a meeting.
Meanwhile, Engine No.1 released another statement saying shareholders should “not be fooled by ExxonMobil’s last-ditch attempt to stave off much-needed board change.” Charlie Penner, head of active engagement at Engine No 1, went on television to complain. “They’re doing a tactic called the whittle-down, where they tell a shareholder to draw down your votes for this person, they tell another shareholder they’ll draw down their votes for this person, and they gradually try to whittle people down,” he told CNBC. “It has a very banana-republic feel.”
The pause was something that Anne Simpson – the California Public Employees’ Retirement System’s managing investment director for board governance and sustainability – had never seen before in her three-decade career.
Simpson didn’t get a call from Exxon about altering her votes.
But the practice still disturbed her. “If the comments are

true, this raises the question about the sanctity of the ballot box and whether companies should have privileged access," she said.

The meeting didn't conclude until almost three hours after it first began, with Littleton reading out a summary of the preliminary tally of votes.

"We welcome the new directors Gregory Goff and Kaisa Hietala to the board," Woods said in his concluding remarks, "and look forward to working with them constructively and collectively on behalf of all shareholders."

Spain to invest 1.5B euros in 'green hydrogen'

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The goal is for Spain to become Europe's leading hydrogen producer using renewable sources instead of fossil fuels to curb greenhouse gas emissions and create jobs, he said.

"The Spanish government is firmly committed to green hydrogen," the Socialist premier said at a ceremony in Toledo, just south of Madrid.

His government expects the outlay will stimulate 8.9 billion euros of mainly private-sector investment to develop the technology by 2030.

Madrid has already received over 500 "green hydrogen" project proposals from energy firms, a government statement said.

Creating "green" or emissions-free hydrogen is seen as a key step towards developing sustainable energy sources and slashing carbon emissions.

One reason for the strong interest in hydrogen technology is when used to fuel motors, the only emission is water vapour.

But it is expensive to produce and the electricity needed generates a lot of carbon dioxide emissions or other pollutants.

Green hydrogen is produced via electrolysis – an electrical current passing through water – with wind, solar or hydro-electric power providing the electricity.

Europe in particular is anxious to get a handle on the new and still costly fuel, having missed the boat on solar and battery technology, which is dominated by China.

Experts predict green hydrogen using renewable energy will soon plunge in cost and become cheaper than natural gas in many areas.

US engine maker Cummins announced Monday it would spend 50 million euros to build one of the world's biggest electrolyser plants for the production of green hydrogen in Spain.

The plant, which will be built in the central region of Castilla-La Mancha, is expected to open in 2023.

"Spain offers a strong and dynamic local environment for hydrogen production, and we are excited to invest," said Cummins chairman Tom Linebarger.

Spain is set to receive 140 billion euros – half in direct payments, half in loans – from the 750 billion-euro recovery plan adopted by EU leaders last year as the economy reeled under virus lockdown restrictions. (AFP)

Climate change goals: green art of the possible

By Daniel Gros/Brussels

US President Joe Biden recently gathered 40 world leaders for a summit on combating climate change, a welcome sign of progress on forging a global strategy. But tackling global warming is a marathon, not a sprint. And while the recent increase in climate ambition from the United States and the European Union is welcome, more difficult choices lie ahead.

Back in 2009, for example, the US led the global effort to achieve the Copenhagen Accord at the COP15 climate-change summit, which was attended by more than 100 world leaders. But hopes of a meaningful US contribution were subsequently killed by bipartisan opposition in Congress, which balked at the perceived cost of reducing emissions.

Biden, who was then vice president, faces a similar problem today: how to make good on his pledges while knowing that Congress will not approve any serious climate measure. He has therefore chosen the path of least political resistance, which is why Biden’s climate plan carefully avoids notions such as a “carbon tax” or a “cap-and-trade” emissions scheme, both of which are politically toxic in the US.

Biden’s target of halving US emissions by 2030 sounds ambitious, but the substance is actually much less demanding.

Governments invariably choose the benchmark year that makes the biggest headlines. The US has chosen 2005, because that represents the high-water mark for US emissions. Since then, emissions have already declined by about 25%, thanks to the substitution of shale gas for coal. Reducing emissions by 50% from 2005 levels requires a further fall of about 30%.

The EU also has chosen a convenient baseline, namely, its own peak emissions year of 1990. But its target of lowering emissions by 55% by 2030 entails a further reduction of over 40% from today’s level.

Given that US per capita emissions are currently about twice the European level, achieving Biden’s pledge would reduce them only to the EU’s level of today by 2030. By that year, US per capita emissions would still be more than double those of the EU.

The key to the Biden administration achieving its 2030 target is its pledge to make the US power sector emissions-free by 2035. But this might be difficult to achieve, given that fossil fuels currently account for about 60% of US electricity (compared to about 34% in the EU).

Moreover, making one sector totally emissions-free while taking little action in other areas increases the cost of reaching the overall target. This is a mistake the EU previously tried to avoid when establishing its Emissions Trading System (ETS), which covers both industry and the power sector.

The Biden plan boldly asserts that decarbonising the power sector “can be achieved through multiple cost-effective pathways.” This is difficult to believe. For starters, it took more than a decade of subsidies before renewables made a meaningful contribution to the overall energy mix in Europe.

The cost of renewables has fallen greatly over the last decade, in many cases by a factor of five, partly thanks to these subsidies setting in motion a cost-reduction process as demand for solar panels and batteries increased.

The Biden administration also says that carbon capture and storage can make a potentially important contribution. But CCS remains an expensive technology, with a much smaller potential for cost reductions.

US climate policy thus makes little sense from an economic point of view. Biden’s approach is instead best understood as a political strategy aimed at so-called battleground states such as Pennsylvania, where coal remains economically and politically important. A carbon price will become possible in the US only when the last coal mine has closed.

The European approach – with the ETS and its emissions allowances that can be traded across sectors and countries – looks much more sensible at first sight. But a closer look reveals similarities with Biden’s plan. When the ETS was created, industrial firms argued that sectors subject to international competition should receive their allowances for free to avoid so-called “carbon leakage.” Predictably, the risk of carbon leakage was found to exist in almost all industries. EU industry thus obtained most of the allowances for free. The ETS worked only because the EU’s power sector was treated differently, given that there is no international competition in this sector.

The implicit deal underpinning the ETS was thus that industry would be spared the pain of emissions reductions. The entire burden of adjustment fell on power generation, where an increasing supply of renewables made it possible to reduce emissions by about a quarter over the last decade. EU industrial emissions have not fallen significantly. But this might change now that the price of emissions certificates, which for many years had remained in the single digits, has reached almost €50 ($60) per ton.

Free allocation of emissions allowances also meant that the EU has had little justification for introducing a carbon border tax. Such a measure would be justified (and should be approved by the World Trade Organisation) only if the free allowances were abolished at the same time – but this is vehemently opposed by industry.

The underlying political deal is thus similar on both sides of the Atlantic: decarbonise the power sector first, while sheltering industry from higher costs. Europe’s experience suggests that this can generate some modest progress in reducing emissions, but achieving the more ambitious targets ahead will require tougher choices. The US will not be able to rely on renewables providing all its power, and the EU will have to start putting pressure on its own industry. — Project Syndicate

? Daniel Gros is a member of the board and a distinguished fellow at the Centre for European Policy Studies.

Getting to zero deforestation in the Amazon by 2030

Amazon deforestation in Brazil reached a 12-year high in 2020, and over 95 per cent of it is illegal. Governments and markets must radically revalue the rainforest’s natural services and stimulate a green economy to avoid a nightmare scenario.

The Amazon Basin is fast approaching an irreversible tipping point. That should concern everyone, because what happens in the Amazon has planetary implications.

Spanning eight South American countries and French Guiana, the Amazon contains over 60 per cent of the world’s tropical forests, 20 per cent of its fresh water, and about 10 per cent of biodiversity.

As a result of land speculation and insatiable global demand for meat, soy, gold, and other commodities, roughly 20 per cent of the world’s largest tropical forest has already been razed.

A further 5 per cent rise in deforestation levels could trigger catastrophic dieback, essentially dooming the 2015 Paris climate agreement.

Some fear this process may already have started. The current prognosis is not good: Amazon deforestation in Brazil reached a 12-year high in 2020, and over 95 per cent of it is illegal.

Unless governments and markets radically revalue the rainforest’s natural services, this nightmare scenario may be unavoidable.

Dieback in the Amazon Basin could release the equivalent of a decade’s worth of global greenhouse-gas emissions. The forest would also lose its ability to absorb billions of tons of carbon dioxide, disrupting hydrological cycles, evapotranspiration, and ocean currents.

The agro-industrial sector could collapse, and the loss of biodiversity could be staggering. Hydroelectric facilities would be shuttered, declining water tables would make cities unlivable, and fisheries would become unviable.

Preventing this outcome requires achieving zero deforestation in the Amazon by 2030. And that, in turn, requires a clearheaded scientific assessment and science-based targets.

The Science Panel for the Amazon, a coalition of about 200 leading scientists from the region, should become permanent. And, given the extraordinary wealth potential of preserving the forest’s biodiversity, the best way to protect this resource is by stimulating the emergence of a green economy.

For starters, this will require a crackdown on illegal deforestation and the networks that sustain it. Brazil’s environmental enforcement agency, Ibama, handed out 20 per cent fewer fines in 2020 than in 2019, owing to funding cuts and reduced sanctions – and less than 3 per cent of fines are paid.

Reinforcing Ibama, a federal agency, is essential, as is bolstering state-level institutions on the frontlines of environmental crime, such as police, firefighters, and land registration offices.

Illegal deforestation occurs in several ways, but typically involves unlawful land invasions, followed by forest clearance for commercial agriculture and ranching.

Another encroachment, wildcat mining, mostly for gold, undermines local ecosystems and human health, while wildlife trafficking, fueled by unrelenting global demand for rare birds, reptiles, and mammals, also affects forest health.

Currently, two-thirds of global supply chains have no policies on illegal deforestation. Massive investment in high-resolution remote sensing and artificial intelligence-based alert systems is essential, as is tracking illegally extracted commodities in global supply chains and strengthening investigation and prosecution.

One of the most important priorities in the Amazon is developing a transparent and accountable system that allows property titles and land demarcations to be registered and monitored properly over time.

Given the considerable fraud and corruption in most Amazonian countries’ land registries, creating a digitised, accessible, and up-to-date ledger is critical to enforcing existing laws and stimulating legal markets.

Developing an online dispute-resolution process to address outstanding legacy litigation related to competing land claims is no less vital. And establishing a blockchain verification system for land registries to demonstrate a clear chain of ownership and custody, while difficult, would greatly improve the prospects for a green economy.

Another priority is accelerating reforestation and land regeneration. In Brazil, home to 60 per cent of the Amazon, the state of Pará is an obvious location for such efforts. In Colombia, Peru, and Ecuador, which together contain roughly 23 per cent of the Amazon, the states of Amazonas, Loreto, and Pastaza, respectively, stand out.

The key is to build a predictable pipeline of reforestation, biodiversity conservation, and sustainable forest management projects that can scale rapidly.

The Reducing Emissions from Deforestation and Forest Degradation initiative could accelerate funding for such efforts. International financing from the Amazon Fund, US President Joe Biden’s administration, and tools such as green bonds would help, while local financing also could play a significant role.

So, too, could initiatives such as the Global Commons Alliance and 1t.org, along with investor activism, including from sovereign wealth and pension funds. In 2019, some 230 global investors, managing a total of more than $16 trillion in assets, called on companies to meet their deforestation commitments or risk adverse economic consequences.

Most important are innovations to bolster the green economy and support the communities that are the custodians of the Amazon Basin. Such initiatives could be accelerated by a Brazilian equivalent to the US government's Defense Advanced Research Projects Agency to ramp up research and development, as well as related regulatory frameworks to enable an inclusive bioeconomy in the Amazon.

This approach would include applied research to collect and map Amazon biodiversity – with scientists studying fruits, nuts, plant extracts, and fibers, and using drones to sample biodiversity in hard-to-reach areas – along with digital platforms to secure biological assets for the public good.

To ensure that indigenous and local populations are included and benefit, clear and enforceable data-sharing rules and safeguards to promote local value creation and retention must accompany these efforts. In addition, establishing low- and high-tech innovation hubs in selected countries can stimulate local innovation, harness traditional knowledge, and ensure local ownership.

Advancing the green economy and achieving zero deforestation in the Amazon will depend on the combined efforts of governments, the private sector, and civil society. In Brazil, several groups – including the Concert for the Amazon and the Brazilian Coalition on Climate, Forests, and Agriculture – are playing a pivotal role in shaping the agenda and connecting stakeholders. And with the country's federal government missing in action on this issue, local governments also are stepping up.

Concerted international and regional efforts – such as the Leticia Pact – combined with national and subnational interventions could create a brighter future for the Amazon.

The health of the planet depends on it.

Robert Muggah, Juan Carlos Castilla-Rubio, and Julia Sekula contributed to this commentary.

Ilona Szabó, Co-Founder and President of the Igarapé Institute, is an affiliate scholar at Princeton University’s Brazil LAB and a public policy fellow at Columbia University

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Big brands join $1bn forest conservation push for SE Asia

Major household brands and palm-oil buyers Nestle and PepsiCo have backed a scheme that aims to invest $1bn in forest conservation across Southeast Asia over 25 years. The Rimba

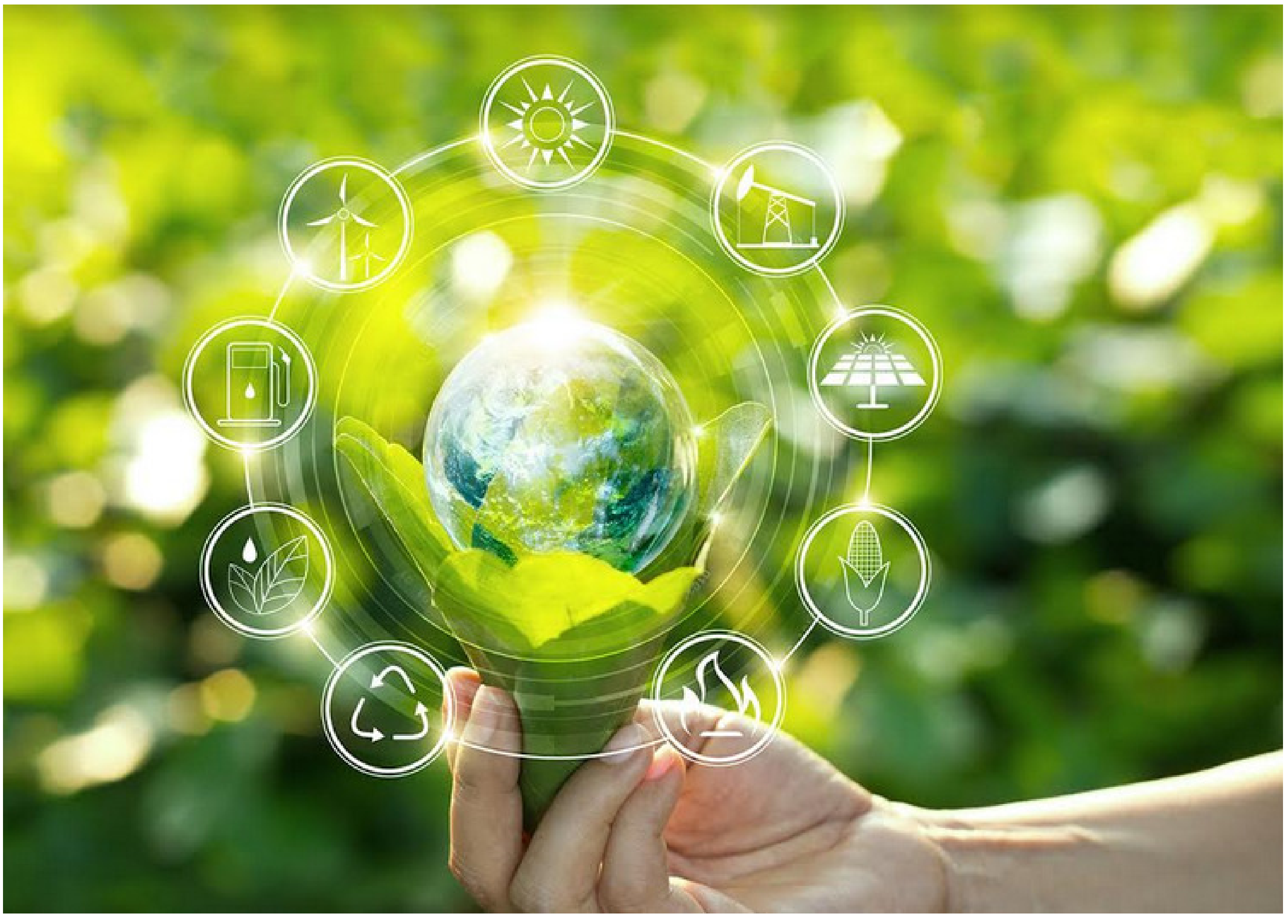
Collective, developed by Lestari Capital, a Singapore-based impact investment firm, will fund projects that protect and restore more than 500,000 hectares (1.2mn acres) of tropical forests in Indonesia and the region. “By linking conservation funding directly with company operations, it has the potential to be a game-changer for forest protection and restoration,” Michal Zrust, Lestari Capital co-founder, told a virtual launch event this week. The initiative will complement eff orts by other groups to build more sustainable palm-oil supply chains, he added. In 2020, tropical forest losses around the world equalled the size of the Netherlands, according to monitoring service Global Forest Watch.

Green groups blame production of commodities like palm oil and minerals for much of the destruction of forests, as they are cleared for plantations, ranches, farms and mines. Cutting down forests has major implications for global goals to curb climate change, as trees absorb about a third of the planet-warming emissions produced worldwide, but release carbon back into the air when they rot or are burned. Forests also provide food and livelihoods, and are an essential habitat for wildlife. Indonesia is home to the world’s third-largest tropical forests but is also its biggest producer of palm oil, an edible oil used in everything from margarine to soap and fuel. Many big buyers of palm oil, besides purchasing certified sustainable oil, have invested in technologies to monitor their supply chains and help stop deforestation, but with limited success so far. The Rimba Collective will have an initial focus on projects in Indonesia and aims to be the largest businessled conservation initiative in the region. Its founding partners are consumer goods companies Nestle, PepsiCo, Procter & Gamble and Singapore-based agribusiness Wilmar International.

They will contribute funding managed by Lestari Capital for a portfolio of forest conservation projects in Southeast Asia. It is hoped more investors, such as commodity traders, palm oil processors and growers, consumer goods firms and manufacturers, will join the scheme before the first payments are made in December. Projects will be selected based on their potential to protect and restore large areas of natural ecosystems and critical habitats such as rainforest, peatland and mangroves. Other priorities are to generate measurable ecosystem benefits – including carbon sequestration, water purification and soil health – and decent livelihoods for local communities. Benjamin Ware, global head of sustainable sourcing and climate delivery at Nestle, said the firm's involvement would "enable us to speed up our proactive eff orts to protect forests and peatlands as well as human rights", beyond its supply chain.

Last year, well-known brands launched a fresh push to stop commodity supply chains fuelling forest loss. It was met with scepticism by many green groups after the same set of companies failed to meet a 2020 target to purchase only sustainably produced commodities. Environmentalists urged firms in the Rimba Collective to ensure their entire supply chains are not linked to deforestation and to transparently report on progress. Grant Rosoman, senior adviser at Greenpeace International, said more finance for forest conservation, especially led by communities, was desperately needed. He welcomed the long-term nature of the new scheme and the fact that its results will be verified independently. But transparency around how it works, including its costs, payments and the organisation running it, are crucial, he added. "We are also concerned that with carbon sequestration as one of the stated benefits, carbon credits may be claimed and sold to climate polluters," he told the Thomson Reuters Foundation. Marcus Colchester, a senior policy advisor at the UK-based Forest Peoples Programme, called the Rimba project "innovative" and urged Indonesia to help by simplifying its onerous process for recognising customary land rights. Kevin Woods, a senior policy analyst at Washington-based nonprofit Forest Trends, said studies showed results are poor when forest conservation does not support those rights. “This can be best achieved by funds going through local organisations that work closely with forest-based communities on…conservation,” he said.

Inevitable fragments of a carbonneutral society: Natural gas coupled with CCUS, renewables, and hydrogen



As global society keeps pursuing a zero-carbon energy system, hydrogen's role is becoming more notable. Updates and progress around the topic are now being broadcasted at an increasing pace, extending to areas that promise a significant role for hydrogen. Just a couple of years ago, everyone had agreed that hydrogen would gain a meaningful share by around 2050. However, these days, due to sanctioned projects and the advancement of the related technologies with a set of adopted strategies, it is believed that the hydrogen era will materialise much earlier.

Hydrogen is not the only piece of the puzzle to achieve carbon neutrality, but it is the one that promises a feasible pathway towards net zero-emission through complementing other routes such as electrification and natural gas coupled with CCUS (carbon capture, utilisation and storage). The supremacy of hydrogen is based on the possibility that it can be employed to decarbonise the so-called hard-to-abate sectors or in sectors in which other decarbonisation pathways, such as electrification, are challenged. These sectors include but are not limited to steel, iron and cement, as well as heavy long-haul vehicles, aviation, and maritime and railways transportation. The GECF Hydrogen Scenario encompasses some of these recent developments in its latest update, which was published in February 2021. The Scenario has taken into consideration the latest updates and strategies adopted by countries and groups and assessed their impacts.

Currently, several countries have officially published their hydrogen strategies or hydrogen roadmaps. In some of the roadmaps and strategies such as the EU Hydrogen Strategy, the main priority has been attached to renewable hydrogen. While in some others, such as for Japan, Russia, and South Korea, blue hydrogen is envisaged to take a meaningful role. In certain strategies, definite and clear targets are set, like for the EU Hydrogen Strategy that considers a minimum of 40 GW installed renewable hydrogen electrolyser or 10mn tonnes (mt) of renewable hydrogen by 2030. Within the EU Hydrogen

Strategy, another 40 GW is also defined as a target to install in the neighbouring countries and import to the EU. According to the latest results from the updated GECF Hydrogen Scenario which assumes a practical penetration of hydrogen into the future of the energy system, the demand for hydrogen by 2050 will increase by more than four times. However, the carbon saving through this hydrogen penetration is forecasted to be less than six (6) GtCO2 – far below the amount needed to achieve the Paris Agreement goals.

This result emphasises that, firstly, the hydrogen production supply chain needs to advance in all parts, and the cost should be reduced to gain more share in the future of the energy system. Secondly, the result highlights that hydrogen could not be the only solution in the carbon neutrality pathway, and other clean and decarbonised options, such as the application of natural gas coupled with CCUS has to be seriously taken into consideration by all stakeholders. Henceforth, let’s take a look at some results and forecasts from the Reference Case Scenario (RCS) of the latest GECF Global Gas Outlook 2050 (GGO 2050), as it will enable a clear view of the potential needs to fully decarbonise the hard-to-abate energy sectors when hydrogen is hypothetically assumed to take a sole role. According to the RCS results, the total EU transport demand in so-called hard-to-abate sectors will be reduced from 217mn tonnes of oil equivalent (mtoe); in 2019 and pre-Covid-19 pandemic situation, to around 150 mtoe by 2050. This reduction is primarily due to the energy efficiency enhancement of the fleets. In order to produce 150 mtoe of energy, around 52mt of hydrogen is needed, requiring more than 500 GW of electrolyser. This should be added to the demand from the iron, steel, and cement industry (other assumed hard-to-abate sectors.) The fossil fuel demand (coal, natural gas and oil products) from these sectors in the EU is forecasted to stand at 24 mtoe by 2050. To meet this level of demand only with green hydrogen, around 70 GW of the electrolyser must be installed. Based on the forecasted demand levels, the EU will need around 570 GW of electrolyser capacity to decarbonise the aforementioned hard-to-abate sectors in case that the green hydrogen is assumed to be the only solution. Based on technical circumstances and the policy, in the EU Hydrogen Strategy, the target was set to 2 x 40 GW renewable hydrogen by 2030. Therefore, the needed electrolyser capacity for 2050 seems to be challenging but feasible in the EU. However, we still need to bear in mind some other salient points. The first point is that these results are based on assuming a successful effort in enhancing energy efficiency, and the level is subject to uncertainty. The second is that this is the volume needed only to decarbonise the referenced hard-to-abate sectors. Several other consuming sectors are supposed to be decarbonised through other pathways such as electrification.

They also create a massive volume of renewable electricity demand. A big question mark here is to gauge if there is a sufficient potential of renewable energies within the EU to accommodate all renewable electricity demand in the sectors and meet the electricity demand of electrolysers to produce green hydrogen. By looking into this subject from a global perspective, it can be observed that much more hydrogen is needed to decarbonise even these so-called hard-to-abate sectors. According to the latest modelling results published in GGO 2050, the global energy demand from hard-to-abate subsectors within transportation will stand at around 1800 mtoe per annum by 2050. In a hypothetical assumption, to provide this amount of energy only through green hydrogen production, more than 6,000 GW of electrolyser will be needed. This level is around five times more than the total current wind and solar installed capacity.

With similar calculations again on the imaginary only-green hydrogen assumption, 1,500 GW of electrolyser should be installed for the decarbonisation of iron, steel, and cement sectors. While numerous sectors are still not included in these calculations, other measures are assumed for the purpose of decarbonisation as well. In conclusion, the undeniable fact is that that there is no sole solution for carbon neutrality. Indeed, a combination of measures needs to be applied to achieve a net-zero emission. Apart from the energy conservation and energy efficiency enhancement that results in a reduction in final energy demand, clean energy supply should be diversely sourced from all clean available potentials. Renewables, natural gas, and CCUS will take greater roles in their original form, and all of them should contribute to the hydrogen production. In closing, renewables, natural gas, CCUS, and hydrogen are inevitable parts of a fully decarbonised energy system.