EU states delay ‘green’ finance guide, leave it open to nuclear power

BRUSSELS (Reuters) – A set of European Union standards to determine which financial products qualify as “green” should be delayed until the end of 2022, EU governments agreed on Wednesday, stirring concern because the guidelines might end up including investments in nuclear power.

The delay, if confirmed by EU lawmakers, could slow the growth of the $200 billion market for green bonds, by pushing back clearer standards that many investors wanted. Proponents of green investment condemned the postponement.

“We don’t need to waste two more years,” said Luca Bonaccorsi, an activist with the Transport and Environment campaign group. Clearer standards were urgently needed to fund a sustainable economy, he said.

Deciding which investments could be called green was part of a legislative proposal put forward last year by the European Commission, the EU's executive arm. Its goal was to encourage private investment in environmentally sustainable businesses.

The proposal laid out a taxonomy – a set of criteria and procedures for deciding what made an investment green – that was due to take effect in 2020. But many EU members objected, fearing damage to their national industries.

Diplomats agreed to postpone introduction of the taxonomy by more than two years. They also agreed to grant governments more powers to decide which investments are green, amending procedures proposed by the commission that would have given independent experts more say.

NUCLEAR CONCERNS

EU governments' compromise does not exclude any economic activity from being listed as green. That could pave the way for declaring as green investments meant to reduce the environmental impact of nuclear reactors or plants seen as highly polluting.

The decision runs counter to recommendations from an EU expert group, which had advised in June excluding nuclear and coal-fired plants from the EU taxonomy. Their environmental impact was seen as going against EU targets to cut carbon emissions and reduce hazardous waste.

The text agreed by EU governments needs the approval of the European Parliament, which also wanted to rule out nuclear and coal investments from projects deemed green.

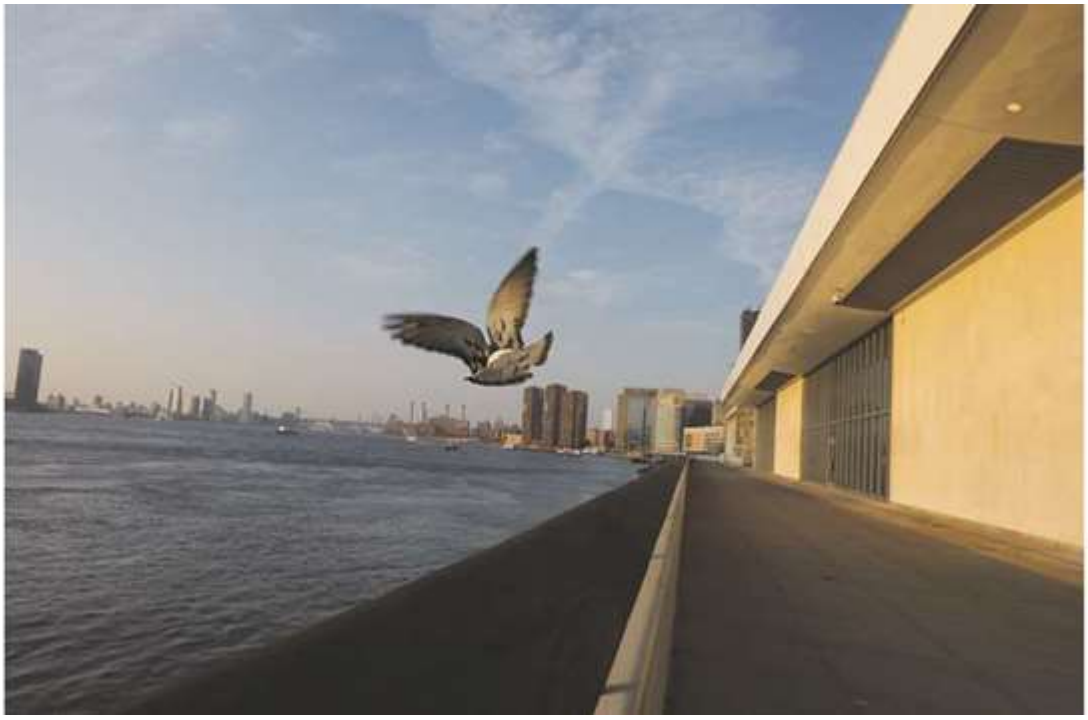
"This is a disaster," Green European lawmaker Sven Giegold said. Parliament will do all it can to apply the new standards earlier and to exclude nuclear and polluting activities from the taxonomy, he said.

By setting criteria on what investment is sustainable, the EU hoped to avoid different standards in its 28 states and increase the confidence of climate-conscious investors. Proliferating standards let companies “greenwash” their activities, claiming green credential they not deserve.

However, the EU taxonomy’s broad criteria could divert money to technologies that “cannot be considered either safe or sustainable,” Germany said in a statement appended to the compromise text and also signed by Austria and Luxembourg.

The compromise ignored those concerns and tried instead to allay opposing fears of countries such as France, which relies on nuclear energy, and eastern European nations, which still depend on coal.

Oil CEOs push carbon-capture efforts ahead of climate talks



Reuters/New York

A group of 13 major oil companies charted out a plan yesterday to promote investments in carbon capture, use and storage (CCUS), ahead of a gathering in New York.

Oil chiefs grappling with growing demand for action to fight climate change have looked to invest in carbon-capture and sequestration techniques that some executives, including Occidental Petroleum Corp CEO Vicki Hollub, say could make drilling carbon neutral.

With fossil fuel development growing worldwide, the oil and gas industry faces growing criticism from activists concerned about accelerating climate impacts from melting ice caps to sea-level rise and extreme weather.

Scientists say the world needs to halve greenhouse gas emissions over the next decade to avoid catastrophic warming.

Carbon sequestration technology traps carbon in caverns or porous spaces underground.

A number of oil and gas CEOs say the technology will be crucial to meeting goals set in the 2016 Paris agreement on climate change to reduce global emissions.

“A lot of people don’t even know what CCUS is. I think the world is going to hear more and more and more about it,” BP

plc CEO Bob Dudley said. “I don’t think we can meet the Paris goals without CCUS.”

The group, known as the Oil and Gas Climate Initiative (OGCI), said it aims to double the amount of carbon dioxide stored globally by 2030.

The group is also taking steps to reduce methane emissions.

The group formed in 2014 to support efforts to reduce greenhouse gas emissions.

Its gathering will be held on the sidelines of a climate summit, where United Nations Secretary-General Antonio Guterres says he is banking on new pledges from governments and businesses to abandon fossil fuels.

Last Friday, millions of young people flooded the streets of cities around the world to demand urgent steps to stop climate change.

Many, including 16-year-old Swedish activist Greta Thunberg, have criticised governments and industries for not doing enough.

The OGCI group said in a statement that carbon-capture technologies could be expanded to more efficiently trap large amounts of carbon released by facilities such as power plants, which could then be used in oil recovery and, ultimately stored – thus, removing it from the atmosphere.

The group plans to work with others to put carbon-capture techniques into operation in the US, UK, Norway, the Netherlands, and China.

Later yesterday, , it was set to sign a declaration of collaboration with certain energy ministers and other stakeholders, to commit to efforts to expand carbon storage.

The companies, which include Exxon Mobil Corp, Chevron Corp and BP, account for 32% of global oil and gas production.

They have agreed to cooperate to accelerate reduction of greenhouse gas emissions.

Separately, almost 90 big companies in sectors from food to cement to telecommunications are pledging to slash greenhouse gas emissions, organisers said.

Coal may outlive climate change but can’t survive the drought

Bloomberg/Vienna

Asia’s prolonged binge on coal is making the grids that transmit power to a third of the world’s people brittle and prone to failure.

That’s the conclusion of new research in the peer-reviewed journal Energy & Environmental Science.

More than 400 gigawatts of new coal-fired capacity in Asia are at risk as climate change dries out water sources necessary to cool those plants, according to the study.

“Coal power development can expect reduced reliability in many locations across Asia,” Edward Byers, one of the report’s authors, said by e-mail. “This is further evidence of coal power’s increasingly recognised incompatibility with current

international and national climate and sustainable development policy.”

Summer heatwaves and reduced rainfall have been closing water-cooled power plants across the world as the impact of climate change exacerbates the nexus between water and energy supply. Asian utilities building coal plans could find themselves increasingly competing with industry and consumers for scarce water resources.

“This planned capacity adds 30% more to the existing coal-fired generation capacity, and will engender substantial water requirements and amounts of pollutants that can exacerbate global climate change and regional air pollution,” the researchers wrote.

Thermal power generation could fall as much as 16% globally in the next three decades because of water shortages, they concluded. Researchers used hydrological and climate models as well as data from the Global Coal Plant Tracker to reach their conclusions. Different warming scenarios ranging to as high as 3 degrees Celsius (5.4 Fahrenheit) were considered. The world is currently on a warming trajectory that may hit 5 degree Celsius by the end of the century.

Bearish signal for crude as China closes in on filling oil storage

One of the fascinating tidbits to come to light in the wake of the attacks on Saudi Arabia's crude facilities was China's disclosure that it has enough oil inventories to last 80 days. There isn't too much short-term significance in this, other than to confirm that China probably won't be frantic to find replacements for any loss of imports from Saudi Arabia.

But the information is vitally important from a medium to longer term view of the crude oil markets.

China's strategic petroleum reserve (SPR) is largely shrouded in mystery, with no official disclosure of the actual level of inventories in the world's largest crude importer.

It likely surprised the market, however, that Beijing is quite close to the 90 days of import cover recommended by the International Energy Agency (IEA) as the level of reserves that importing nations should hold.

Earlier this year it was estimated by some analysts that China had around 40 to 50 days of import cover.

The figure of 80 days of crude oil in both commercial and strategic storage was released on Sept. 20 by Li Fulong, the head of development and planning at the National Energy Administration.

While Li didn't disclose the exact amount of stored crude, it is likely to be around 788 million barrels, based on taking the average daily imports of 9.85 million barrels per day (bpd) for the first eight months of 2019.

The last time inventories were officially acknowledged was in December 2017, when it was disclosed that reserves as of end-June 2017 were 277 million barrels.

This implies that from July 2017 to Sept. 20 this year, China added 511 million barrels of crude, about 630,000 bpd.

It would also seem that the rate of stock building has been accelerating in 2019, if the difference between the total crude processed at China's refineries and the amount of crude available from both imports and domestic output is calculated.

Domestic output in the first eight months of 2019 was 3.83 million bpd and imports were 9.85 million bpd, giving a combined total of 13.68 million bpd.

Refinery throughput for the same period was 12.74 million bpd, implying that about 940,000 bpd went into either commercial or strategic stocks.

If China does conclude its stockpiling at 90 days of import cover, the implication is that it has about 98.5 million barrels still to go.

At a 940,000 bpd rate, this further implies that the filling of China's storage could be finished in about 105 days.

There is no guarantee, of course, that China will continue to build inventories at the same clip it has been, or indeed that it will stop at 90 days worth of import cover.

But the risk for the global crude market is that sometime in the next six months, and possibly earlier, China may dial back the amount of crude it is buying for storage.

Mining industry seeks to polish tarnished reputation

The global mining industry is increasingly showing a commitment towards greater respect for human rights and the environment, but is accused of wanting to improve its reputation without seeking real progress.

Wildcat miners, including children, are risking their lives daily to unearth metals and minerals they sell to mining companies. In return, they earn a subsistence wage but not the working rights of a legal and salaried mining group employee.

“While industry initiatives on certain minerals and metals are helpful, companies are still responsible for undertaking

comprehensive human rights due diligence across all minerals and metals in their supply chains," Eniko Horvath, senior researcher at the Business and Human Rights Resource Centre (BHRRC), told AFP.

In June, dozens of illegal miners died when part of a copper mine collapsed in southeastern DR Congo. The mine was in the Kolwezi area operated by Kamoto Copper Company, a subsidiary of the Swiss giant Glencore.
Meanwhile at the start of the year, a dam collapse at a mine operated by Brazilian group Vale unleashed a tsunami of mud that killed more than 200 people while around 100 more went missing.

China, also the scene of fatal mining accidents, has additionally been in the spotlight for its dumping of toxic waste in Baotou, Inner Mongolia, as Beijing drives global production of rare earth elements used in key technologies such as smartphones.

Faced with rising criticism, the mining industry says it wants to adopt standards of good governance.

The London Metal Exchange, the global centre for trading in industrial metals, recently adopted new ethical standards to ensure better traceability of raw materials, especially those most at risk such as cobalt used heavily in high-end technology.

"As metals play an increasingly important role in society with increased focus on ethical supply chains, the LME's role and responsibility is vital," the exchange's incoming and first female chair Gay Huey Evans said on her appointment.

Earlier this month, the World Gold Council (WGC) issued "Responsible Gold Mining Principles", although the guidance is non-binding.

The industry body calls upon its members to "respect the human

rights” of workers and communities affected by mining activities.

“We will work to ensure that fragile ecosystems, critical habitats and endangered species are protected from damage and we will plan for responsible mine closure,” according to another directive.

A spokesman for Barrick Gold, the world’s largest producer of the precious metal, told AFP that the group was already meeting or exceeding the new WGC guidance, while Glencore has laid out a similar charter to that provided by the World Gold Council.

Elsewhere, BMW along with German chemical giant BASF and Samsung last week announced a joint project to ensure “responsible” cobalt mining in DR Congo.

“It’s great to see these statements of purpose and expressions of a willingness to meet these standards, but they have to be matched with action,” Amnesty International official Lucy Graham told AFP.

“What we really want to see is laws that are going to legally require industry to mine minerals responsibly and transparently.”

Jamie Kneen, from MiningWatch Canada, said he believed companies and industry bodies were simply providing “yet another effort at PR whitewash”.

He added: “The standards that they are incorporating are… self-administered and audited by unaccountable third parties; and they are explicitly focused on providing confidence to investors and buyers with not even a mention of host or affected communities.”

Kneen said there was a need for “enforceable… legal and regulatory standards at all levels”.

To help companies face their responsibilities, human rights group BHRRC has this month launched a dedicated website, the Transition Minerals Tracker.

It “seeks to improve the human rights practices of companies that produce the minerals vital to the renewable energy and electric vehicles sectors, by shedding light on the key human rights risks in the geographies where they operate”, noted Horvath.

Tellurian signs $7.5bn agreement with India’s Petronet for US LNG

Tellurian Inc. said it signed a $7.5 billion agreement for

India’s Petronet LNG Ltd. to buy into its proposed liquefied natural gas terminal in Louisiana, in what could potentially be one of the largest foreign investments in the U.S. to ship shale gas abroad.

Petronet will spend $2.5 billion for an 18% equity stake in the $28 billion Driftwood LNG terminal — the largest outside holding so far in the project — and negotiate the purchase of 5 million tons of gas per annum. The remainder of the total will come from debt, Tellurian Chief Executive Officer Meg Gentle said.

The companies plan to complete the accord by March 31, by which time Tellurian hopes to have signed up partners to enable it to proceed with the project.

“We will sign the document sometime in the first quarter and we will have financing ready to close simultaneously, and then we will begin construction,” Gentle said in a telephone interview. “India is one of the fastest growth markets for LNG and should soon become the second-largest LNG importer.”

The deal, signed in Houston in the presence of Indian Prime Minister Narendra Modi, underscores a record year for the LNG industry, with tens of billions of dollars worth of export projects given the green light. The surge of new supply from America’s trove of shale gas has rendered the once-premium fuel accessible for emerging markets such as India, currently the sixth-largest buyer of U.S. LNG.

“People should not be surprised this came,” said Tellurian co-founder Charif Souki, who also started America’s largest LNG exporter Cheniere Energy Inc. “The United States and India have a significant issue diametrically opposed. We have too much gas that we don’t know what to do with and India needs greater gas, and 1 million tons a time is not going to solve the problem.”

The Petronet deal, the largest by an Indian company in U.S.

LNG, comes days after the gas industry's all-important GasTech conference and coincides with Modi's much-anticipated visit to Texas. He's set to take the podium at Houston's NRG Stadium with President Trump on Sunday and address a crowd of more than 50,000.

"This deal will further help diversify India's energy supplies," said Lydia Powell, who runs the Centre for Resources Management at the New Delhi-based Observer Research Foundation think tank. "The U.S. wants to displace Middle East supplies and India is a large market."

Petronet's investment is vying to be the largest by a foreign entity with one that Sempra Energy expects to finalize in Texas with Saudi Aramco.

Tellurian expects to finalize the last 4 million tons needed for Driftwood's first phase with one or two partners in the coming months, Gentle said. Petronet's share represents about $2 billion in annual fuel sales for the life of Driftwood, she said.

"It supports the drilling industry and the pipeline industry, and there is going to be an enormous amount of resources," Souki said.

The world's biggest offshore wind farm could be cheaper than coal

The world's biggest offshore wind park planned off the coast of England will probably in the next decade generate power

more cheaply than by burning coal.

A number of offshore wind projects won contracts to sell power at guaranteed prices in a UK auction Friday. The price of 39.65 pounds per megawatt-hour (around R740) was 31% below the level in a similar auction two years ago.

The plunge highlights how offshore wind, which only a few years ago was a niche technology more expensive than nuclear reactors, is changing the economics of energy around the world. Both utilities and, increasingly, energy majors, are planning to spend $448 billion through 2030 on an eightfold capacity increase, according to BloombergNEF.

Projects from developers including SSE Plc, Equinor ASA and Innogy SE won offshore wind power-purchase contracts that will have the capacity to generate as much as 5.5 gigawatts of power, the government said. That includes a joint SSE-Equinor project off England's east coast to build the biggest single offshore wind park in the world.

"The auction results today show offshore wind is in line with current power prices – it is already competitive with existing fossil fuel plants, let alone new fossil fuels," said Deepa Venkateswaran, an analyst at Sanford C. Bernstein & Co. in London. "In the next auction in 2021 we will see costs go well below that of existing fossil fuel plants."

One of the winning areas, known as Dogger Bank, is off the coast of Yorkshire. Three projects by Equinor and SSE were approved in the zone for a total generation of 3.6 gigawatts. Another 1.4 gigawatt project developed by Innogy was also approved in the same area.

Key step

Equinor's success at the auction is a key step in its transition to becoming a broader energy company than just an oil and gas major. The state-controlled Norwegian company has

a target of investing as much as 20% of its capital in new energy solutions by 2030.

“Dogger Bank, together with the recent award for Empire Wind in the US, positions Equinor as an offshore wind major,” said Pal Eitrheim, Equinor’s executive vice president for new energy solutions. “These projects provide economies of scale and synergies, making us an even stronger competitive force in offshore wind globally.”

SSE winning capacity will accelerate its shift away from a traditional utility to an energy company focused on renewable power and grids. The Scottish company has agreed to sell its UK domestic supply business to Ovo Energy.

The agreements give the projects a guaranteed buyer through what’s known as a contracts-for-difference mechanism. If the wholesale rate is lower than the set price, the government pays the developer the difference. If it’s higher, the company pays it back. UK month-ahead power is trading at 42.05 pounds per megawatt-hour, down 34% this year.

Even as wind power moves away from a reliance on government subsidies, the contracts could still play an important role going forward. The guarantee helps developers secure financing and also make the assets more attractive to institutional investors who want reliable returns. The next UK auction round is set to take place in 2021.

The Crown Estate said Thursday it plans to open the first contest in a decade for sites around the British coast that could draw as much as 20 billion pounds of investment in offshore wind.

For sale

The contracts also open up a track for investors to take stakes in some of these projects. Earlier this year, Iberdrola sold a stake in its 714-megawatt East Anglia One

project to Macquarie Group Ltd. for 1.63 billion pounds (R30bn). Projects that have the backing of government-supported purchase agreements are often more attractive to investors who favor the guaranteed prices.

Innogy will likely sell a stake in it 1.4 gigawatt Sofia Offshore Wind Farm development in the Dogger Bank Area, according to Richard Sandford, the company's director of offshore investment and asset management. The company hasn't decided how big of a stake it will sell, but plans to make a final decision sometime next year. SSE also said it will look to sell equity in a 454-megawatt project in Scotland that it won a contract for in the auction.

Cheap US gas is killing nuclear; green power may fi nish the job

The natural gas boom is killing America’s nuclear industry. Wind and solar may finish the job.

While nuclear plants struggle to compete with the flood of cheap gas coming from the nation’s shale fields, they still offer a key advantage, supporters say: They generate 24-hour electricity without producing carbon emissions. Renewables, meanwhile, haven’t yet nailed down the storage capacity needed to do that. Proponents insist it’s only a matter of time.

Battery prices have plunged 85% from 2010 through 2018, and huge storage plants are planned in California and Arizona. Meanwhile, science is advancing on new technology — including chemical alternatives to lithium-ion systems — with the potential to supply power for 100 hours straight, sun or no sun.

All signs point to the acceleration of renewable energy that can out-compete nuclear and fossil fuels,” said Jodie Van Horn, director of the Sierra Club’s Ready for 100 campaign, a group seeking a grid powered solely by renewables.

The drive for grids that are 100% emissions-free is being pushed by a growing number of U.S. states citing increasingly aggressive time frames. In July, New York mandated that 70% of the state's power come from renewables by 2030, and 100% by 2040. Seven other states, including California, have similar mandates, and Virginia's governor earlier this month announced an executive order calling for 100% clean energy there by 2050.

Still, there remains a gap between now and 2050. "To get to 80%-to-85%, you can see a path to get there with today's technologies," said Yayoi Sekine, an analyst with BloombergNEF. But using renewables to achieve the final 15%, "that's where the challenge really is."

By 2050, BNEF expects renewables to account for 48% of the U.S. power system, paired with multiple types of supplemental, peaking plants that can supply electricity when needed.

Today, these plants typically burn cheap gas, supplied by a muscled-up U.S. shale industry. By 2035, though, so-called battery peakers — large arrays that store energy when renewables are working at their peak, and send power when they're not — will be more cost-competitive, according to BNEF forecasts. Meanwhile, over the same period, nuclear will wane, as high costs force most reactors to just shut down.

The U.S. isn't the only place where the nuclear industry is struggling. Some nations that rely heavily on the technology, including France and Sweden, are reducing nuclear's load as old reactors retire, and diversifying into cheaper solar and wind power.

Still, the industry has the potential to grow in countries where costs can be reduced through shorter construction times. Engineers in China have been able to build and connect nuclear plants in less than seven years, on average, while their counterparts in the U.S. and Europe need a decade or more.

When is change a ‘crisis’? Why climate terms matter

By Emma Vickers New York

The discussion around changing weather is changing. Anodyne references to “climate change” and “global warming” are being scorned by those who think it’s time for more drastic talk, and action, on the environment. They prefer more urgent terminology in hopes that it translates to more urgent action.

1. What new terms are part of the discussion?
Young demonstrators around the world are demanding that their governments declare climate “emergencies,” going so far as to skip school on Fridays to hold so-called climate strikes. The UK’s Guardian newspaper, which champions environmental issues, said in May that it was changing its house style to prefer

“climate emergency,” “climate crisis” or “climate breakdown” over “climate change” (as well as “global heating” over “global warming”). Editor-in-chief Katharine Viner said “climate change” sounds “rather passive and gentle when what scientists are talking about is a catastrophe for humanity.”

2. Is it showing results?
Maybe. In a poll by the Washington Post and the Kaiser Family Foundation, 38% of US adults termed climate change “a crisis,” while an equal number called it “a major problem but not a crisis.” The Democratic leadership of the US House of Representatives this year established a Select Committee on the Climate Crisis, which aims, by March 2020, to publish a blueprint for keeping the gain in the Earth’s temperature to less than 1.5 degrees Celsius (2.7 degrees Fahrenheit). When Democrats last held a majority in the House, in 2007, they created a similar committee but called it the Select Committee for Energy Independence and Global Warming. It was abolished when Republicans regained control of the House in 2011.

3. Isn’t this just semantics?
Literally, yes. And it could be argued that much more tangible steps are being taken: With a changing atmosphere already upon us, use of electric cars is growing, renewable energy is already cheaper than coal in many places (and is becoming cheaper), many investors are uprooting carbon from portfolios and more and more people are eating less meat. But activists argue that stronger words can focus attention on the planet in a new way, and that rallying cries can prompt corresponding action.

4. What sort of action?
By mid-2019, local and national governments representing 206mn people had declared “climate emergencies,” according to the Climate Emergency Declaration Petition, a campaign group. It says in most cases, that means the government commits to develop an action plan within six months. The student climate strikers who advocate use of “emergency” want governments to

commit to switching to 100% renewable energy as soon as possible, preferably by 2030.

Solar, wind power are so cheap they’re outgrowing subsidies

Bloomberg/San Francisco/New York

For years, wind and solar power were derided as boondoggles. They were too expensive, the argument went, to build without government handouts.

Today, renewable energy is so cheap that the handouts they once needed are disappearing.

On sun-drenched fields across Spain and Italy, developers are building solar farms without subsidies or tax-breaks, betting they can profit without them. In China, the government plans to stop financially supporting new wind farms. And in the US,

developers are signing shorter sales contracts, opting to depend on competitive markets for revenue once the agreements expire.

The developments have profound implications for the push to phase out fossil fuels and slow the onset of climate change. Electricity generation and heating account for 25% of global greenhouse gases. As wind and solar demonstrate they can compete on their own against coal- and natural gas-fired plants, the economic and political arguments in favor of carbon-free power become harder and harder to refute.

“The training wheels are off,” said Joe Osha, an equity analyst at JMP Securities. “Prices have declined enough for both solar and wind that there’s a path toward continued deployment in a post-subsidy world.”

The reason, in short, is the subsidies worked. After decades of quotas, tax breaks and feed-in-tariffs, wind and solar have been deployed widely enough for manufacturers and developers to become increasingly efficient and drive down costs. The cost of wind power has fallen about 50% since 2010. Solar has dropped 85%. That makes them cheaper than new coal and gas plants in two-thirds of the world, according to BloombergNEF.

“Solar got cheap,” said Jenny Chase, an analyst at BNEF. “It’s really that simple.”

Yet for all its promise, clean energy still has a long way to go before fully usurping coal and gas. Wind and solar still only accounted for about 7% of electricity generation worldwide last year, according to BNEF. And most wind and solar projects still depend on subsides. In the US, in fact, the solar industry is pushing to extend federal tax credits that are scheduled to decline over the next few years.

And then there’s the issue of round-the-clock power. Solar doesn’t work at night. Wind farms go idle when breezes slack. So until battery systems are cheap enough for generators to stockpile electricity for hours at a time, renewables can’t constantly provide power like coal and gas.

Perhaps nowhere is the push toward subsidy-free clean energy clearer than on arid expanses of Southern Europe. About 750

megawatts of subsidy-free clean-energy projects are expected to connect to the grid in 2019 alone, across Spain, Italy, Portugal and elsewhere — enough to power about 333,000 households, according to Pietro Radoia, an analyst at BNEF.

"The cheapest way of producing electricity in Spain is the sun," Jose Dominguez Abascal, the nation's secretary of state for energy, said last year.

The road to subsidy-free renewables wasn't easy for Spain. A decade ago, it offered developers a lavish feed-in tariff, prompting an uncontrolled boom that strained the national treasury. Spain slashed incentives and now has a hands-off energy policy.

China, the world's largest renewable energy market, also propped up wind and solar for years. Now it's shifting toward a more market-driven approach. Earlier this year, officials announced a plan to develop 20.8 gigawatts of renewable projects that can only profit from selling electricity into grids at prices equal to or less than coal. Plus, most wind farms built on land — as opposed to in the ocean — won't be eligible for subsidies after 2021.

The picture is less clear in the US. Nearly every American wind and solar project remains eligible for subsidies through federal tax breaks, which are scheduled to decrease or phase out altogether over the next few years. Plus, dozens of states have renewable-energy quotas, forcing utilities to buy a certain amount of wind and solar.

Still, they're starting to compete on their own. The proof is in the sales agreements. For years, clean-energy developers needed 20- or 25-year power-purchase contracts to ensure a return on investment. Now they're building wind and solar farms with agreements for 15 years or less — with the expectation that projects will compete against gas- and coal-fired plants in wholesale markets after the deals conclude.