

Russia Looks to Hydrogen as Way to Make Gas Greener for Europe



Russia is looking at how to develop a market for hydrogen in Europe, a move that would help maintain demand for one of its primary exports as governments everywhere work to cut pollution.

Gazprom PJSC, the Russian company that's the dominant exporter of natural gas into Europe, is exploring ways to produce emissions-free hydrogen from its fuel and create a 153 billion-euro (\$175 billion) a year market by 2050, according to a presentation executives from the company made in Brussels last month. That would be bigger than the \$110 billion value of Europe's existing natural gas supply last year.

The effort would bring Russia in step with the government of Japan, oil major Royal Dutch Shell Plc and a handful of

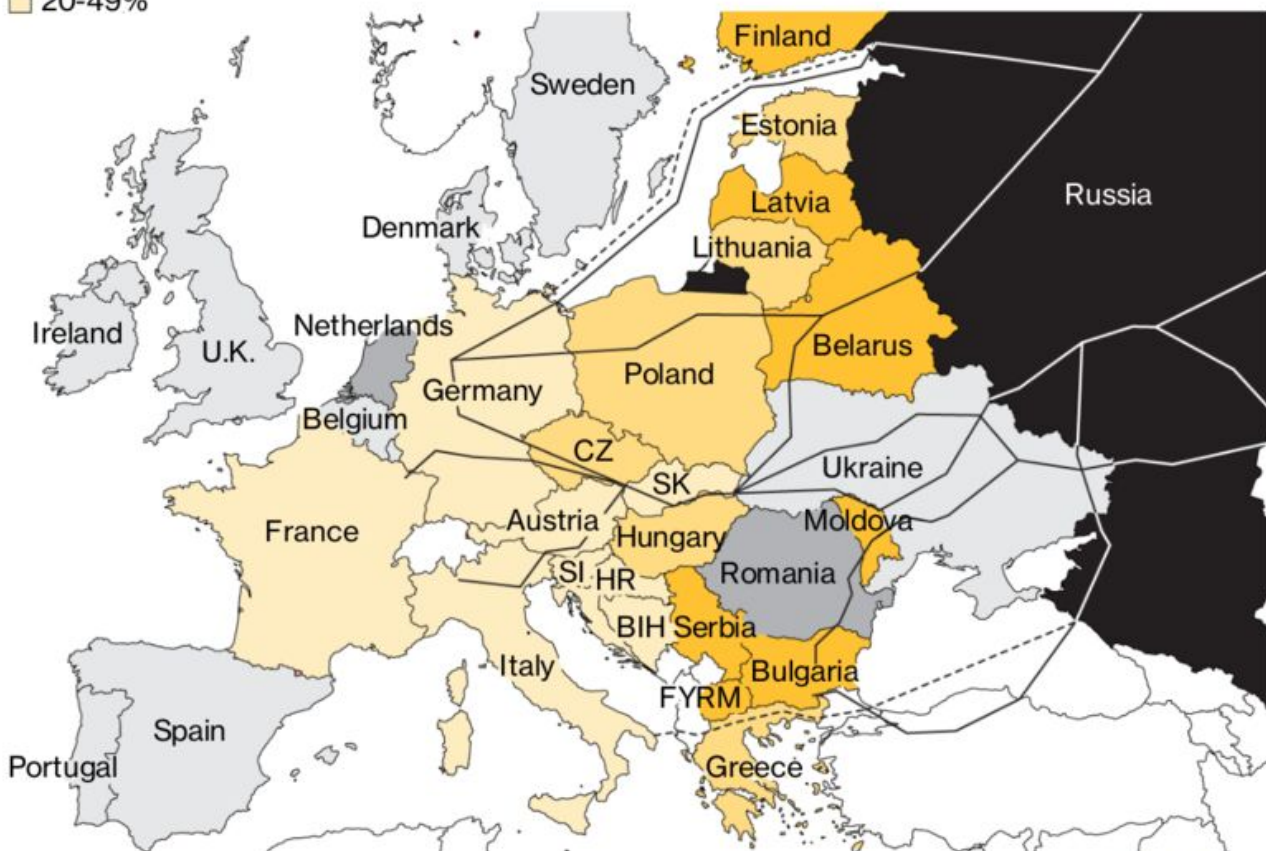
companies that are promoting fuel cells and hydrogen as an alternative to electricity generation and transportation fed by fossil fuels. With Europe working to make dramatic reductions in greenhouse gas emissions, Russia is looking for ways to make its gas green enough to remain part of the energy mix. Hydrogen is an option because it can be made from natural gas without generating additional emissions.

“It would not do the entire job but a large part of it,” Michael Faltenbacher, a principal consultant at Germany’s Thinkstep AG, which carried out a study for Gazprom, said at the presentation at Gazprom’s offices in Brussels. “We are looking at a major CO2 reduction potential which will come at a financial cost. There is definitely investments related to that but also opportunities for industry and economy.”

Who’s Dependent on Russian Gas?

About a third of Europe’s gas comes from Russia

- 75-100%
- 50-75%
- 20-49%
- Less than 20%
- 0%
- Major pipeline
- - - Planned pipeline



2017 data. Source: Agency for the Cooperation of Energy Regulators **BloombergQuickTake**

2017 data. Source: Agency for the Cooperation of Energy

Regulators

Natural gas already is the main raw material used to make hydrogen commercially, and some of the lighter gas is already blended in a small proportion into Europe's gas pipeline network. What Gazprom is envisioning is gradually boosting the share of hydrogen in those pipelines and then turning its natural gas into hydrogen through green processes that don't exacerbate global warming.

While several technologies to produce hydrogen including water electrolysis are being developed, Gazprom is investigating one process known as thermal methane pyrolysis. This reaction takes place in a low-temperature, non-equilibrium plasma that's put under high pressure in a small reactor. The company is trialing the technology in the Siberian town of Tomsk.

"Natural gas from Russia is now the cleanest available for Europe," Maximilian Kuhn, public affairs expert Gazprom Germany, said at a conference in Berlin on Thursday. "Our proposal is to recognize that natural gas is a solution for Germany to achieve its Paris climate target. We could reach the target based on natural gas."

With no contact with oxygen, no CO₂ is emitted when hydrogen atoms are split off from natural gas. That process makes a stream of pure hydrogen, with carbon dropping out as a solid instead of escaping into the air as CO₂. That solid carbon can be used in industries. If wind or solar farms are used to generate energy needed for that process, zero emissions would be used in manufacturing the hydrogen.

"Gas companies are scared and worried as renewable costs are falling, electricity heating is expanding, and European nations are adopting very strong hydrogen policies, potentially making the entire gas infrastructure redundant," said Claire Curry, an analyst at Bloomberg NEF in New York. "It sounds interesting if they can capture carbon cheaply, but there are challenges. It is unclear if people will want

hydrogen in their homes, and that also wouldn't help Europe become energy independent."

Gazprom's vision is to introduce an emissions-free form of hydrogen into its business over the next few decades. That would help Europe to reduce emissions by 62 percent by 2050, a big chunk of the bloc's commitment to slash pollution 80 percent by that year from 1990 levels. Gazprom is offering three stages, as outlined below.

From Gas to Hydrogen

Gazprom envisages a 3-stage process to introduce and expand role of hydrogen in its business

NOTE: Total reduction is seen at ~49%. 62% reduction is needed to reach 2050 CO2 target of -80% greenhouse emissions vs 1990. Gap of ~13% seen filled with efficiency measures. Source: Thinkstep

The first stage in the Gazprom program, already being promoted, envisages switching power plants and vehicles to gas from coal and gasoline, respectively. The next stage would involve building up hydrogen in a mix with natural gas.

Current blend limit of hydrogen into gas grids varies from zero in the U.K. to 12 percent in the Netherlands, according to Thinkstep. A mix with as much as 20 percent of hydrogen could be used on the majority of applications, without challenges or infrastructure changes, according to Gazprom.

A ratio of over 25 percent of hydrogen used in the pipeline networks can lead to lower crack resistance in steel pipes and increases over 30 percent may require adaptation of turbines and compressors, according to Thinkstep.

"Pipelines and regulations would have to be changed to allow a higher ratio of hydrogen used in the system," Bloomberg NEF's

Curry said.

How much hydrogen is allowed in pipelines?

Gazprom is still considering how the business might evolve from there. It may be more viable to produce hydrogen in Europe and then mix it there with gas arriving from Russia, according to Gazprom experts. Any changes would need careful study by Gazprom's customers, European regulators and other interested groups.

"Natural gas due to its density would make more sense to transport over long distances and then have the hydrogen production locally," Thinkstep's Faltenbacher said.

Russia first presented its active contribution to a CO₂-free gas provision to Europe during a workshop in Berlin in August, according to a report on the European Commission's website, which acknowledged the nation's perspectives of methane cracking, a technology which could provide emissions-free hydrogen at large scale.

This "could be used as a potential and cost efficient transition pathway for introducing renewable based hydrogen in the longer term," the report said. "Rules for certifying that the carbon by-product from methane cracking is deposited without being released to the atmosphere as CO₂ would yet have to be developed."

The other main process for making hydrogen from natural gas is known as electrolysis, where an electric charge is introduced into a stream of gas to break those molecules into their constituent parts.

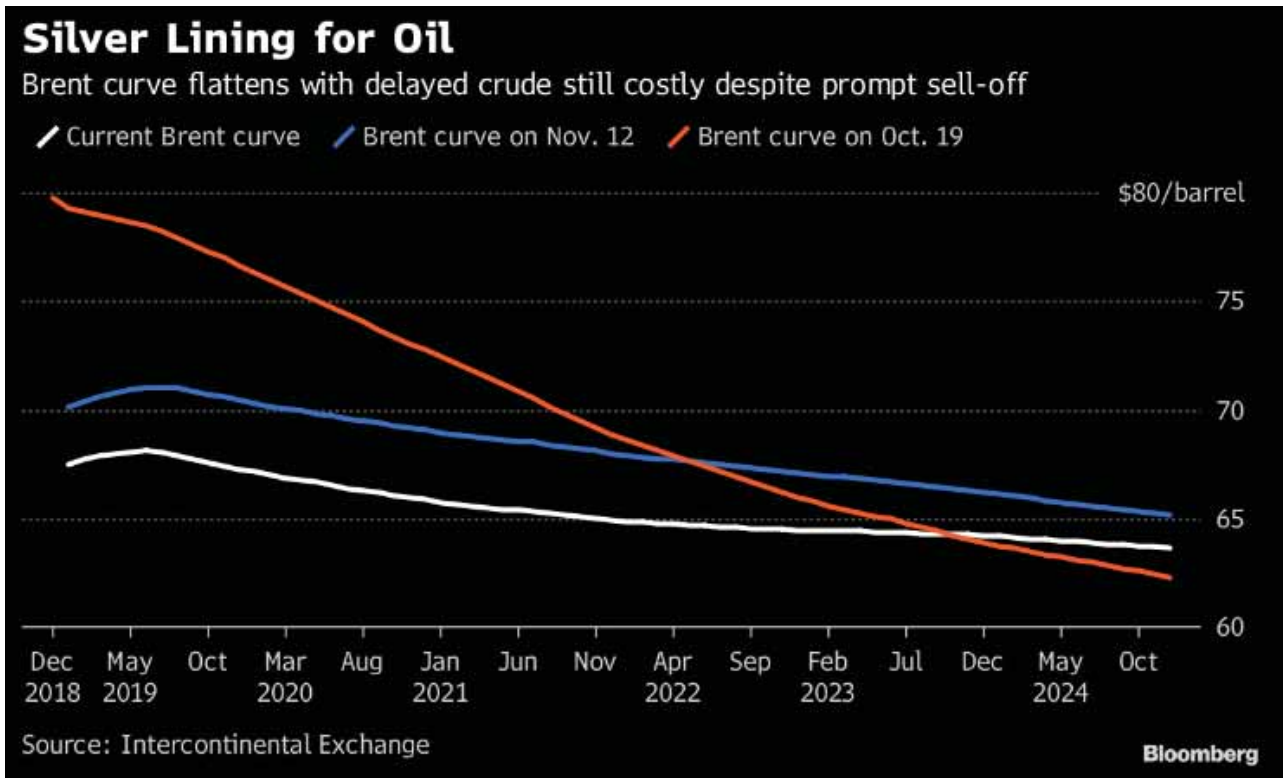
The Russian company might be able to make hydrogen at a cost of 1.14 euros per kilogram by 2050, according to Thinkstep. Hydrogen could be produced today in northern Germany via

electrolysis, using curtailed wind and the lower end of wholesale power prices, at 2.21 euros per kilogram, a cost that may fall to 1.77 euros by 2025, according to Bloomberg NEF.

Other global energy companies are also looking at hydrogen. Norway's Equinor ASA has commissioned a feasibility study for a hydrogen plant in July, while Woodside Petroleum Ltd. has held talks with a Japanese hydrogen supply project led by Chiyoda Corp.

Hydrogen is one of the fuels that Shell is providing. Among its initiatives, Shell is part of a joint venture in Germany which is installing a nationwide network of 400 hydrogen fueling pumps. It has also opened hydrogen refueling sites in California, the U.K. and Canada and has announced the construction of 4 more stations in the Netherlands.

Brent oil curve reveals silver lining as supply woes lurk



For oil bulls who were disheartened by Brent crude's dire plunge of about 25% over the past few weeks, its forward curve offers a silver lining, according to Bloomberg. Prices of the global benchmark's later-dated contracts remain supported due to supply shortage fears.

The curve's back-end didn't fall as much as prompt contracts, emerging "relatively unscathed" from the recent sell-off, due largely to years of insufficient upstream capital expenditures, according to Konstantinos Venetis, a senior economist at TS Lombard.

Oil short-selling jumps in record streak as faith in

OPEC wanes



NEW YORK (Bloomberg) – Hedge funds are betting OPEC will struggle to reverse oil’s precipitous plunge.

Their combined wagers against West Texas Intermediate and Brent crude soared for a seventh straight week, the longest global short-selling streak in data going back to 2011. The bearish bets jumped 14% in the week ended Nov. 13 and have tripled since the end of September, according to data from the U.S. Commodity Futures Trade Commission and ICE Futures Europe on Friday.

With oil prices slipping into a bear market, OPEC has promised to do what it takes to cut output. Still, it’s unclear how far the cartel and its allies will go, and it may take a reduction well beyond the 1 MMbpd that’s been publicly discussed to restore faith, said Daniel Ghali, a commodities strategist at TD Securities in Toronto.

“We’ve been through not just a price shock, but a momentum

shock," he said in a telephone interview. "Given that, we don't think oil will recover these losses in short order without a significant catalyst, and that may have to be OPEC doing more than expected.'

The jump in bearish bets came amid a 12-day losing streak for WTI crude prices, the longest on record, culminating in a 7.1% tumble on Tuesday. Investors received more bearish news on Wednesday as a weekly government report showed a boom in shale drilling pushed U.S. stockpiles up by 10.27 MMbbl, almost three times the median forecast.

The persistent bearishness, after oil had already given back much of its yearly gain, surprised Bill O'Grady, chief market strategist at Confluence Investment Management in St. Louis. Computer driven trades may be adding to the downward pressure, he said, as crude crashes through one technical-support barrier after another.

Still, he and Ghali saw some embers of optimism in an uptick in long WTI bets. "It tells you the bearish news is kind of in the market already," O'Grady said by telephone. "Perhaps what we ended up getting was traders that looked at this and said, 'Ok, you're down 20%, maybe I should start throwing some longs on there.'"

Russia wait-and-see stance on Opec+ cuts shows gap with Saudi



Bloomberg/Moscow

Russia's energy minister insisted the country and its allies in Opec need to watch the oil market in the coming weeks before making any decisions to cut output.

"We need to see how the situation develops in November and early December to better understand both the current conditions and the winter outlook," Alexander Novak said in Moscow yesterday. His refusal to join Saudi counterpart Khalid al-Falih in calling for a broad production cut shows their different positions persist just weeks before a key Opec+ summit in Vienna.

"We need to make a balanced decision, and so far there are no criteria for it," Novak said. While producers did discuss potential output curbs at a meeting in Abu Dhabi earlier this month, they agreed to wait until their December summit before making any decision as more clarity on supply and demand is needed, he said.

A week ago, al-Falih said the Organisation of Petroleum Exporting Countries and its allies need to cut about 1mn bpd from October production levels, reversing about half the increase in output they made earlier this year. The Saudi pronouncement came as fears of supply shortages just a few

months ago were supplanted by concerns about an emerging glut and collapsing prices.

Since Saudi Arabia and Russia are the two de facto leaders of the Opec+ alliance, their differing stance suggests negotiations on December 7 could prove difficult.

The Saudis need an oil price of \$73.30 a barrel next year to balance the fiscal budget, according to the International Monetary Fund. That's \$6 higher than the current price of Brent crude. In Russia, the state budget is much less dependent on oil prices than it was when the country agreed to join Opec-led efforts to rebalance the market back in 2016. President Vladimir Putin said last week that a price around \$70 "suits us completely." Russia's budget will balance next year even if prices for the country's export blend drop as low as \$40 a barrel, according to the Finance Ministry.

Erdogan, Putin celebrate key step in Russia-Turkey gas pipeline



AFP Istanbul

Turkish President Recep Tayyip Erdogan and Russian counterpart Vladimir Putin on Monday marked the completion of the offshore phase of a gas pipeline underneath the Black Sea, the latest sign of burgeoning co-operation between Ankara and Moscow.

Erdogan hailed the TurkStream pipeline, which aims to pump some 31.1bn cu m of gas from Russia to Turkey annually, as a “new step” in Turkish-Russian energy cooperation, which he said showed the “high level” of relations between the two countries.

Yesterday’s ceremony marked the completion of the building of two undersea lines stretching 930km (578 miles) across the Black Sea from Anapa in Russia to Kiyikoy in Turkey at a depth of some 2km (6,500ft).

The pipeline was laid by the special pipe-laying vessel Pioneering Spirit, which is the area of some six football pitches.

Putin and Erdogan watched via video link in Istanbul as the last section was welded and laid into the sea by the vessel.

Putin said he believed TurkStream and the Akkuyu nuclear power station would become “clear symbols of the growing development of Russia and Turkey’s multi-faceted partnership.”

“This (TurkStream) will without doubt turn Turkey into a serious European hub and this will without doubt have an effect on the geopolitical position of the Turkish Republic,” he added.

The onshore section of the pipeline in Turkey still needs to be built and TurkStream expects the gas to start being pumped at the end of 2019.

The aim is that half of the gas pumped through the pipeline will go to ensure the energy needs of western Turkish cities like Istanbul, Bursa and Izmir and the other half sent on to other European countries.

Despite in theory being on opposite sides of the Syrian civil war, regime backer Russia and rebel supporter Turkey have worked closely to end the conflict and stave off a government assault to re-take the key region of Idlib.

Meanwhile, Ankara and Moscow have agreed terms on the delivery of S-400 missiles in a deal that had alarmed Nato member Turkey’s Western allies.

“We have never determined our bilateral relations with Russia according to demands or pressure from other countries,” Erdogan said to loud applause.

Putin meanwhile personally praised Erdogan, saying the TurkStream project could not have been released without the Turkish president.

“Such a project needs political will and courage. Because in the circumstances of growing competition such projects cannot be without this,” he said.

Both leaders also reaffirmed their goal to lift annual

bilateral trade volumes to \$100bn, which Putin said was the same as between Russia and China.

“Why should it be less with Turkey? We will achieve this result. I don’t even doubt this,” said Putin.

Norway lawmakers call for scrutiny of wealth fund Saudi holdings



Norwegian socialist lawmakers are stepping up pressure to review the country’s \$1tn wealth fund’s investments in Saudi Arabia after the killing of journalist Jamal Khashoggi. In a proposal to parliament put forward last week, lawmakers representing the small Socialist Left Party demanded an overhaul

of the country's ties with Saudi Arabia, including the wealth fund's holdings in the kingdom. Legislators, including the party's standing member on the Finance Committee, Kari Elisabeth Kaski, said the government needs to examine whether the investments are in compliance with the fund's ethical and human rights framework. They also asked for a review of all investments in weapon producers and the supply of weapons to the war in Yemen. It's unclear if the motion will receive broader backing from the main opposition party, Labor, or the three-party minority government. Abid Raja, a key lawmaker for the Liberals, a member of the ruling coalition, also last month called on the fund to divest from Saudi Arabia. At the end of last year, the fund held about \$831mns in Saudi Arabian stocks, invested in 42 companies. The holdings have more than doubled since it entered Saudi Arabia in 2015, but records show that it dumped its holding in Saudi Telecom Company. The fund was set to increase its investments in Saudi Arabia due to the country being included in indexes, but that was put on hold by the government earlier this month amid a broader global review. Also earlier this month, Norway's Foreign Minister Ine Eriksen Soreide said that the government will halt any new export licences for sales of defence material to Saudi Arabia.

Energy firms dive with oil in Asia; major markets fall into negative territory



AFP/Hong Kong

Asian energy firms took another battering yesterday after oil prices suffered their worst day in three years, while most of the region's major equity markets fell into negative territory.

The pound enjoyed some support after Britain and the European Union said they had reached a draft Brexit deal, though observers were cautious as it faces a number of hurdles before being given the green light.

Both main crude contracts plunged Tuesday – Brent lost 6.6% and WTI 7.1% – on oversupply fears just as demand falters in the face of the China-US trade war and easing economic growth. With prices now down more than a fifth from their four-year highs seen in early October, oil kingpin Saudi Arabia this week said it will cut output.

The announcement fuelled an initial surge in the crude market before a Donald Trump tweet calling for it to keep prices low sent the commodity plunging.

The selling continued on Tuesday and then Wednesday in Asia after Opec trimmed its outlook for demand this year.

And energy firms were caught in the crossfire.

Hong Kong-listed CNOOC dived 4.7% while Sinopec slipped 2.3%

and PetroChina lost 3.6%. In Tokyo, Inpex was 1.9% down and Australia's Woodside Petroleum sank 2.5%.

"Oil prices remain the hottest topic in capital markets if not in the world after extending their slide to 12 days and suffering one of the more precipitous falls in years," said Stephen Innes, head of Asia-Pacific trade at OANDA.

"It's all about the toxic combination of weakening global demand and oversupply that has sent prices tumbling."

And Rakuten Securities commodity analyst Satoru Yoshida tipped Trump's pressure to keep Opec from making deep cuts.

Broader markets were also lower, with Hong Kong slipping 0.5% and Shanghai down 0.9%.

Earlier, figures showed Chinese consumer spending slowed last month, with officials pointing to shoppers saving for the annual Singles Day mega-sale that took place on November 11.

However, there was some upbeat news in an improvement in investment and industrial production.

Sydney lost 1.7%, while there were also losses in Singapore, Seoul, Wellington and Bangkok.

But Tokyo edged up 0.2% despite data showing the Japanese economy shrunk in July-September owing to weakness in China and a series of natural disasters hitting domestic spending.

Manila, Mumbai Taipei and Jakarta also enjoyed gains.

In early European trade, London fell 0.5%, Paris shed 0.8% and Frankfurt was 0.9% lower.

There was little movement after comments from the White House's top economic adviser Larry Kudlow that US and Chinese officials were "having communications at all levels" on trade ahead of a possible meeting between Trump and President Xi Jinping this month.

With both sides digging their heels in, expectations for a breakthrough are low, analysts said.

On currency markets, the pound managed to hold on to small gains that came on the back of news that Prime Minister Theresa May finally had a Brexit agreement to put to her cabinet.

However, she must now get it past a divided cabinet before

putting it to parliament, where both pro- and anti-Brexit MPs are unhappy with the few details that have so far emerged from the pact. "Failure to pass the deal will raise the prospects of a disorderly Brexit, a general election and also a second referendum," said Rodrigo Catril, senior foreign exchange strategist at National Australia Bank.

"By the end of the week with some certainty the pound won't be trading near current levels, it could be significantly higher or massively lower."

And Neil Wilson, chief market analyst at Markets.com warned: "The cabinet will likely pass it but with assault from all sides of the house and Brexit divide, it seems impossible parliament will vote it through."

The euro was also enjoying some lift from the Brexit developments, though the gains were tempered by news that Italy's populist government had stuck to its wallet-busting budget plan, putting it on course for a standoff with Brussels.

Data showing the first shrinkage of the German economy for three years added to pressure on the unit.

In Tokyo, the Nikkei 225 closed up 0.2% to 21,846.48 points; Hong Kong – Hang Seng ended down 0.5% to 25,654.43 points and Shanghai – Composite closed down 0.9% to 2,632.24 points yesterday.

**Pakistan govt plans to
privatise two RLNG-fired
power plants**



The Privatisation Commission (PC) board has asked National Power Parks Management Company Limited (NPP- MCL) to come up with a detailed working pa- per on proposed privatisation of two regasi- fi ed liquid natural gas – RLNG-based power plants, a statement said yesterday. The 1,233MW Balloki and 1,230MW Haveli Bahadur Shah power plants have already been cleared by Cabinet Committee on Privatisa- tion (CCoP) for their 100% privatisation in the next two years. The meeting, which was presided over by Muhammad Mian Soomro, chairman Priva- tisation Commission, directed the manage- ment of NPPMCL to work on the feasibility paper for the privatisation of the power plants as either a bundle package or separate entities along with timelines, justifi cations, and any issues ancillary to it for the consideration of the board and CCoP. A senior offi cial said before initiating the privatisation process of these plants, their case would be taken to the Council of Com- mon Interests (CCI). “After that the privatisation of these entities would be done under the strategic sale,” the of- fi cial added. The statement said the board also directed the concerned department to launch the process for hiring of fi nancial advisers for other public sector enterprises (PSEs) in the Active Privatisation Programme as approved by the federal cabinet. The Evaluation

Committees for privatisation transactions were also constituted during the meeting, it added. The meeting, the statement said, also constituted a committee for the resolution of the issue of contingent payments in the case of Financial Advisory Services Agreements concerning privatisation transactions initiated during the tenure of previous government.

“The board also approved to initiate the process for Hiring of Human Resource and further directed the concerned officials to review Human Resource Regulations in order to streamline the same for the betterment of organisation and to remove anomalies, if any,” the statement said. Almost two weeks back, the Pakistan Tehreek-e-Insaf (PTI) government unveiled its five-year privatisation agenda, and decided to privatise some profit-making entities in oil and gas, power, aviation as well as in banking and insurance sectors; however, it refused to give some loss-making entities in private hands. The Cabinet Committee on Privatisation (CCoP), in a meeting on October 31, 2018, with Finance Minister Asad Umar in chair, decided to privatise nine-entities in the next two years, while two would be given in private possession later. The committee allowed giving the government’s shareholding of 75% in Oil and Gas Development Corp Ltd (OGDCL), 67.5% in Pakistan Petroleum Ltd(PPL) and its 18.39% shares in Mari Petroleum Company Ltd (MPCL) to private sector in short-term through capital market, official sources in the Cabinet Division. The official further said in short-term, sale of 93.38% shares of SME Bank, 44.8% shares in Pakistan Reinsurance Company Limited (PRCL) and 100% shares of State Life Insurance Corp (SLIC) has been approved. Besides, in medium-term, 82.6% shares of the First Woman Bank would also be given to a private strategic partner, the official added. Although, the government has not put the privatisation of Pakistan International Airlines on the list, yet the national flag carrier’s assets, including Roosevelt Hotel in New York and Hotel Scribe in Paris have made the list of the

assets to be sold out in medium-term. The CCoP has also decided not to privatise Utility Stores Corp (USC), Pakistan Steel Mills (PSM) and Civil Aviation Authority (CAA), and have struck them off its privatisation plan.

40-Year-Old Renewable Energy Law's Due for a Revamp



A 40-year-old law that's been key to the growth of renewable energy in the U.S. may be due for an overhaul.

Much has changed since the Public Utility Regulatory Policies Act, called Purpa, was established in response to the Arab oil embargo of the early 1970s. Concerned about energy shortages, Congress wrote the law in part to encourage alternative energy. But that era of scarcity has since been replaced by

one of abundance. And utilities say that Purpa should change with the times.

They say power markets have outgrown the 1978 statute, and that it's burdening customers with billions in extra costs.

"Changes to the market need to be reflected in the law," said Adam L. Benshoff, executive director for regulatory affairs at the Edison Electric Institute, an industry association. "We're certainly missing an opportunity to reduce costs for customers."

They may get their wish. Neil Chatterjee, the new chairman of the Federal Energy Regulatory Commission, which oversees U.S. power markets, has indicated that his agency should take a look at the law. But he hasn't outlined a timeline or scope of that effort.

Market Abuses

As it's written, Purpa requires utilities to purchase power from renewable energy projects under certain circumstances. If a developer can build a project for less than a utility can build a new power plant, then they can request a contract to sell power to the utility.

Purpa Power

But utilities argue that developers have figured how to take advantage of the system. They're asking for immediate fixes to prevent market abuses, and curb instances in which developers break up their projects into smaller ones to qualify for higher rates, according to the Edison Electric Institute. Reducing the threshold for mandatory purchases could also be looked at.

"We're asking for Purpa to be modified in a way that more truly reflects avoided cost and stops some of the gaming,"

said Benschhoff.

Still Relevant

Purpa proponents, including solar and wind developers, reject the notion that it's outdated, saying it's essential to giving renewables a leg up in states that aren't traditionally green leaning.

"Purpa has been a backdoor option to get some renewable projects to states that have few other policy levers that are incentivizing renewable energy," said Timothy Fox, vice president at ClearView Energy Partners LLC. "If the implementation of Purpa is reformed, we could see a slowdown in some of the states with more conventional resources," he said.

About 15 percent of U.S. solar capacity and 3 percent of wind planned to come online in the next few years may rely on Purpa, according to Bloomberg Intelligence.

The solar industry argues that any changes should be focused on making sure the law is enforced.

"It's been a highly successful policy tool and continues to be a highly successful policy in markets where there is not otherwise access," said Abigail Ross Hopper, who heads the Solar Energy Industries Association. Pushback from utilities is unsurprising, she said, since "we're threatening their market, we're threatening their monopoly."

It's all a far cry from when Charles Copeland was working as an engineer on an abandoned building in New York City's Lower East Side back in the 1970s. He designed a solar collector system for a group of residents that generated power for the building and sent the excess to Con Edison.

The utility sued the residents, but the Public Service Commissioner ruled in favor of the building, and the ruling became a crucial forerunner of Purpa. Forty years later,

Copeland says the law is as essential as ever.

“It’s even more urgent now, in terms of global warming,” he said.

GE seeks to raise \$4bn with sale of Baker Hughes stake



General Electric Co yesterday unveiled a plan to raise about \$4bn by accelerating a proposed sale of a stake in oilfield services provider Baker Hughes, its latest move to simplify its businesses and reduce debt. Under the deal, the Boston-based industrial conglomerate will sell up to 101.2mn shares on the market and Baker Hughes will repurchase another 65mn shares from its parent. Based on yesterday’s share price of \$23.76, the sale would raise around \$3.97bn. Once a symbol of

American business power, GE faltered during the 2008 financial crisis and since then has replaced two CEOs. Its stock price has shed more than 80% of its value from highs in early 2000.

After the announcement, shares of GE rose 4.5% to \$8.35, while Baker Hughes was up about half a per cent. The two companies also struck a series of agreements covering digital technology, products and debt to pave way for the share sale. GE, which bought Houston-based Baker Hughes in July 2017 and agreed to maintain a 62.5% stake until the middle of next year, has made a series of changes to lower its debt and focus on its core businesses of jet engines, power plants and renewable energy. The two will continue to share certain oil and gas technologies, and has a six month lock up of GE's remaining stake in the oilfield company. On Monday, recently appointed GE chief executive officer Larry Culp said the company will sell assets with "urgency" to reduce debt, as GE shares tumbled as much as 10% and the cost of insuring its debt hit a six-year high. "The agreements announced today accelerate that plan in a manner that mutually benefits both companies and their shareholders," Culp said in a statement. Baker Hughes CEO Lorenzo Simonelli on Tuesday said the deal provides "clarity for our customers, employees and shareholders." In June, GE said it would sell its stake in Baker Hughes over the next two to three years. As part of the new deal, the companies will dissolve a two-year lock-up that would have prevented GE from selling shares of Baker Hughes until July 2019.

The sale comes as improving oil markets have helped Baker Hughes post a third-quarter adjusted net profit. The oil services firm also said it was optimistic about the near future with oil production in North America climbing to record levels. As part of the deal, GE will sell an undisclosed portion of its shares in the market and others will be acquired by Baker Hughes. GE will reduce its ownership to no more than 50.1% as part of the deal, the companies said. The

companies also will create a joint venture focused on rotating equipment technology, primarily used in Baker Hughes' liquefied natural gas, oil and gas production, and pipeline and industrial segments. Baker Hughes said it had entered into long-term supply and distribution agreements with GE for heavy-duty gas turbine technology.