The clean energy fast track

The global transition from carbon-intensive fossil fuels to cleaner, more reliable renewables like wind and solar is already well underway. But the big question – for the 2020s and beyond – is how fast it will happen. A slow transition would mean that energy-sector incumbents continue to flourish, and we would all but certainly miss the emissions-reduction targets enshrined in the 2015 Paris climate agreement. But if the transition is rapid, incumbents will experience varying degrees of disruption – the price of keeping the Paris targets well within reach. As matters stand, both scenarios are possible, representing two paths that lie before us.In a new report for the World Economic Forum's Global Future Council on Energy, we and our co-authors identify four key areas that will determine which path we take. The Speed of the Energy Transition offers compelling evidence that the transition is coming fast, and that all stakeholders in the global energy system – which is to say, everyone – must start preparing.

One area where the gradual and rapid scenarios diverge is adoption of renewable energy. When will renewables start displacing incumbents? For markets, the key moment will be when renewables make up all of the growth in energy supply, as well as all the growth in electricity supply. That, most likely, will happen in the early 2020s, long before fossil fuels lose their dominant share of total energy supply. As renewables become the leading growth industries in the energy sector, financial markets will increasingly reallocate capital accordingly.

A second area concerns innovation in energy technology, and whether growth in new applications is linear (the gradual scenario) or exponential (the rapid scenario). Solar and wind are already cheaper than fossil fuels when it comes to generating electricity, and electric vehicles are close to challenging internal-combustion-engine cars on price. The evidence suggests that the barriers to growth for EVs in the foreseeable future are soluble. Moreover, new waves of innovation are forthcoming, in the form of nascent but already viable technologies such as green hydrogen energy. Prices for renewables will most likely drop far below those of incumbent energy sources – and fast – leading to exponential growth in green energy.

A third key area is public policy. Will policymaking remain cautious, or will it become more dynamic and ambitious as new technologies create opportunities to improve the design and functioning of markets? Inertia being a powerful force, existing policies have been limited in scope. But history teaches us that there are tipping points: Once genuine change comes, it tends to be adopted rapidly across the board – as in the case of laws prohibiting smoking indoors.

Given that new technologies are already providing better solutions for consumers' energy needs, policymakers inevitably will respond to their constituents' demands. Once enough politicians recognize that the energy transition is not expensive, and will actually boost competitiveness (thereby reducing prices), they will update the rules governing energy markets to make way for the change that is already underway.

The last key area is emerging markets, which could either follow the fossil-fueled path of developed countries, or leapfrog to newer energy technologies. Countries like China and India undoubtedly need to generate far more energy for their citizens, and there are almost 1 billion people worldwide who still lack access to electricity. But that doesn’t mean emerging and developing countries have to opt for high-emission fossil fuels.

Just as mobile phones made landline telephony irrelevant in much of the developing world, increasingly affordable renewables can become the obvious first choice for generating energy.

From our perspective, the evidence clearly points to a rapid energy transition in the years ahead. The danger is that key stakeholders – whether policymakers or investors – will mistake which path we are on, and make poor decisions. If so, we will all have to bear the costs of stranded high-carbon assets and bad investments in obsolete technologies. Worse, we will have missed an early opportunity to achieve sustainability and minimize the risk of catastrophic climate.

Everyone – from innovative technology startups to energy incumbents and government policymakers – has a role to play in determining which path we take. If stakeholders recognize the rapid pace of the global energy transition already underway and embrace the change, we can still hit the Paris targets and have a planet that allows everyone to thrive.

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U.S. shale firms cut budgets, staff as oil-price outlook dim

ODESSA, Texas (Reuters) – Oil producers and their suppliers are cutting budgets, staffs and production goals amid a growing consensus of forecasts that oil and gas prices will stay low for several years.

The U.S. has 904 working rigs, down 14% from a year ago, and even that is probably too many, estimated Harold Hamm, chief executive of shale producer Continental Resources (CLR.N), which has reduced the number of rigs at work.

Bankruptcy filings by U.S. energy producers through mid-August this year have nearly matched the total for the whole of 2018.

A stock index of oil and gas producers hit an all-time low in August, a sign investors are expecting more trouble ahead.

“You’re going to see activity drop across the industry,” Earl Reynolds, CEO of Chaparral Energy (CHAP.N), told Reuters at the EnerCom oil and gas conference last month.

The Oklahoma energy firm has slashed its workforce by nearly a quarter, trimmed its spending plan by 5%, and agreed to sell its headquarters and use some of the proceeds to reduce debt.

Investment bank Cowen & Co estimated last month that oil-and-gas producers spent 56% of their 2019 budgets through June, based on its review of 48 U.S. companies. It expects total spending this year to fall 11% over last year, based on proposed budgets.

The slowdown in drilling is spurring cost-cutting in oilfield services, including staff cuts and restructurings at top firms Schlumberger and Halliburton Co. Schlumberger plans a writedown yet to be determined this quarter, noting its results in North America have been “under significant pressure,” CEO Olivier Le Peuch said on Wednesday.

Halliburton is paring its North American workforce by 8% because of customer spending cuts, and National Oilwell Varco recently offered buyouts to its U.S. workers.

“The service sector I think is going to be flat,” said Superior Drilling Services CEO Troy Meier, whose firm canceled plans to add new machinery.

Such signs of a downturn come as the shale sector had just started generating the cash flow long demanded by investors, who have grown weary of drilling expansions without returns. Last quarter, a group of 29 top publicly-traded producers generated more in cash – $26 million – than it spent on drilling and dividends, according to Morningstar (MORN.O) data provided by the Sightline Institute and the Institute for

Energy Economics and Financial Analysis. A year earlier, the same group had spent $2.4 billion more than it generated.

Despite that progress, many small to mid-sized shale firms are now pulling back on production targets amid the gloomy price projections.

A slowing oil industry could weigh on the United States economy. The boom in shale oil output added about 1 percent to U.S. gross domestic product, or 10% of growth, between 2010 to 2015, according to the Federal Reserve Bank of Dallas. In Texas, the center of shale oil production, energy employment dipped 1.8 percent in the first six months of 2019, according to the Dallas Fed. New drilling permits in the state fell 21% in July compared with the same month last year, according to state data.

MAJORS STAY THE COURSE

Any broader economic impact, however, could be limited by the massive investments in shale drilling by some of the world's biggest oil firms – Exxon Mobil (XOM.N), Chevron (CVX.N), Royal Dutch Shell (RDSa.L) and BP PLC (BP.L). Even as small and mid-sized firms dial back, the majors continue to pour billions of dollars into years-long shale drilling plans. They have argued their integrated well-to-refinery networks allow them to control costs enough to withstand a sustained period of low prices.

Spokespeople for Exxon, Chevron and BP declined to comment on the industry downturn but referred to previous statements of their longterm commitment to shale. Shell did not respond to requests for comment.

Chevron has focused much of its production growth plans on shale, and CEO Michael Wirth has called its Permian Basin holdings in West Texas and eastern New Mexico the "highest return use of our dollars."

Exxon CEO Darren Woods told a Barclays energy conference on Sept. 4 that the company continues to take the long view.

“The way we look at the business is tied to some very basic fundamentals that haven’t changed for decades, if not hundreds of years,” he said, noting it took oil a century to replace coal as the world’s dominant energy source.

Exxon has estimated it can earn a double-digit return in the Permian Basin even if oil falls to $35 a barrel.

BRACING FOR LOW PRICES

U.S. oil prices largely have traded just above $50 a barrel since last November, requiring higher output to generate the same profit as when prices were higher. Prices this quarter are about 18% lower than this time last year, according to U.S. government data.

U.S. oil prices are likely to remain below $55 a barrel for the next three years, said Scott Sheffield, CEO of Pioneer Natural Resources (PXD.N), one of the largest oil producers in the Permian Basin. Lackluster prices will result in a “significant fallback in Permian growth” and probably “no growth for most,” he said on a recent earnings call.

Part of the slowdown comes as the best drilling spots in some areas of the field are being “exhausted at a very quick rate,” Sheffield said.

The severity of the looming downturn is a matter of debate.

Flotek Industries Inc (FTK.N), a supplier of oilfield chemicals, has cut staff twice this year. CEO John Chisholm told Reuters that the industry is just “pumping the brakes” as it grapples with well-design issues.

Matt Sallee, a portfolio manager at energy investors Tortoise Capital, expects a longer industry decline.

“It’s hard to see how this gets any better for several quarters,” he said.

Russia LNG ambitions advance with plans for remotest regions

Bloomberg/ Vladivostok

Russia took a step closer to becoming a dominant player in the global liquefied natural gas market as two of its biggest energy companies advanced plans to export the fuel from its remotest corners.

Rosneft PJSC, Russia’s top oil company, said yesterday it plans together with its partners in the Sakhalin 1 project to build an LNG export plant in the far eastern port city of De-Kastri. Meanwhile Novatek PJSC, the country’s largest LNG producer, made a final investment decision on its $21bn Arctic

LNG 2 plant on the Gulf of Ob.
Natural gas is expected to be the fastest growing fossil fuel through 2040, and it will increasingly be transported in liquid form, according to the International Energy Agency. China, India and other developing countries plan higher imports to bring energy and electricity to their people at a fraction of the pollution of coal or oil.
The two projects combined could export about 26mn tonnes of LNG a year, which would double Russia's existing capacity. Already the world's top exporter of pipeline gas and second-biggest shipper of crude oil, LNG will give President Vladimir Putin a bigger role in driving the world economy via his country's massive energy resources.
"After the oil price crash of 2015 and a massive addition of Australian LNG, supermajors held back major LNG investments – but that has changed now. The global LNG market is expected to hit a supply deficit by 2023, according to BloombergNEF's latest Global LNG Market Outlook. Projects are now being lined up to capture that gap in the market, and the front-runners are those supported by Big Oil," said Fauziah Marzuki, analyst, BloombergNEF.
Russia, which had 8% of the global LNG market last year, wants to boost that to 20% by 2035 to put it in league with the world's biggest exporters, such as Qatar and Australia. Yesterday's announcements, made at the Eastern Economic Forum in Vladivostok, underscore how quickly the country is progressing toward that goal. Its first plant, at Gazprom PJSC's Sakhalin 2, opened in 2009 and its second, Novatek's Yamal LNG, only started in 2017.
The first production unit at Arctic 2 LNG will come online by the end of the third quarter of 2023, Novatek chief executive officer Leonid Mikhelson said. Once fully complete, the plant will be able to produce 19.8mn tonnes of LNG annually. Rosneft CEO Igor Sechin didn't give a timeline for the far east LNG plant, which he said would be able to produce about 6.2mn tonnes a year.
For now, several export projects, including Yamal, have come

online recently and saturated the market, depressing spot LNG prices in Asia to about 60% below where they were a year ago.

California's cross-cutting climate strategy

We are parents, and one of us (Lenny Mendonca) is also a grandparent. We are keenly aware of how the intensifying impact of climate change could affect the futures of not only our children and grandchildren, but also of families throughout California and around the world. Thinking about the effects of climate change, however, doesn't break our will; on the contrary, it only strengthens our resolve to work with California Governor Gavin Newsom to advance his vision for a more sustainable and inclusive economic-growth strategy in our great state.

In fact, California's determination to act only grows as climate effects hit home. Our commitment to innovative climate solutions deepens even as US President Donald Trump’s administration attempts to demolish climate protections. (Trump has already taken action 129 times to repeal or weaken climate regulations. Attempting to revoke California’s long-held authority to set its own auto-emissions standards is only the most recent manoeuvre.)

For example, on September 20, Newsom signed an executive order that seeks “to leverage the state’s $700bn pension investment portfolio and assets to advance California’s climate leadership.” The order “also directs multiple state agencies and departments to review and update overall operations, transportation investments, and use of the state’s purchasing power to advance groundbreaking climate goals.”

Indeed, staying focused on solutions is the only sensible – and moral – option. Just ask Californians living with a longer and more severe “fire season” than ever before, or owners of coastal homes and businesses trying in vain to find insurance to protect their buildings against sea-level rise, or inland residents facing more frequent extreme-heat days. And of course, as with all disruptions, the state’s low-income and disadvantaged communities will disproportionally feel the impacts of climate change. Without support, they will be the least able to adapt and build resilience.

That’s why California is committed to climate leadership through an all-hands-on-deck approach. That means not only reducing greenhouse-gas emissions, but also integrating housing and transportation planning, economic development strategies, and workforce investments. The goal is to achieve a carbon-neutral economy by 2045 while advancing a community-driven transition strategy that implements climate-resilience measures to address the effects Californians are feeling today.

In California, climate change, housing, and transportation are inextricably linked. Nearly 70% of employment growth from 2010 to 2018 was concentrated in the coastal areas around Los Angeles, San Diego, and San Francisco. But housing in those areas is unaffordable for most, meaning that many live far

from their workplaces.
As a result, a growing number of Californians are now living a commuter's nightmare, spending more time in their cars and less time with their families. And longer commutes mean that California's transportation emissions – which already account for 51% of the state's total emissions – are on the rise.
So, beyond imposing stricter vehicle-emissions standards, Newsom has set a goal of building 3.5 mn new housing units by 2025. Working with the state legislature, his administration has allocated $1.75bn to boost housing construction by financing loans and tax breaks for developers of affordable housing, especially those building infill housing nearer to employment hubs.
At the same time, California's Regions Rise Together Initiative – led by our two departments under Newsom's direction – aims to create high-quality job opportunities in inland communities, not only in our state's $50bn agriculture industry, but also in advanced manufacturing, software development, and professional services. In addition to reducing commuter emissions, this will help to ensure that the benefits that have already begun to accrue from our climate and clean-tech investments are more widely shared.
This is not a top-down directive to these regions. Instead, we are focused on finding ways to support the work on sustainable, inclusive growth already occurring across every region of California, while also investing in the critical infrastructure connecting our regions to one another.
For those who must commute, California is investing in its statewide rail network and a high-speed rail strategy. By attracting more investment, jobs, and residents, such infrastructure investments can catalyse the revitalisation of downtown areas that may have lost their vigor.
Meanwhile, to protect the one in 12 California homes facing severe wildfire threats, we are expanding our firefighting resources and investing in cutting-edge technology. Such measures should help to stem the rapid increase in the price of homeowner insurance, which has further aggravated the

housing crisis.
Even as California promotes housing development, it is taking care to protect valuable lands, from farms to forests. As the Intergovernmental Panel on Climate Change recently highlighted, land use must play a central role in climate strategies. If adequately managed and protected, soils and forest lands can store carbon, act as fire breaks for more developed areas, and mitigate flooding and droughts – all while providing valuable economic opportunities.
In fact, California's experience has shattered the myth that climate action must come at the expense of economic prosperity. With a sustainable and inclusive growth strategy, the state has achieved 114 consecutive months of economic expansion. Zero-emission vehicles are now our eighth-largest export.
The climate crisis, decades in the making, is as hard to solve as they come. Building resilience demands a cross-cutting approach. We're proud to work for a state that has committed billions of dollars to developing efficient and alternative transportation, to building affordable housing, to creating good jobs in inland communities, and to expanding health care to help more residents. California is resolute about providing the tools, technology, and leadership to ensure a better tomorrow, for generations to come. – Project Syndicate

*Kate Gordon is Senior Adviser on Climate to the Governor of California and Director of the Governor's Office of Planning and Research. Lenny Mendonca is Chief Economic and Business Adviser and Director of the California Office of Business and Economic Development.

Qatar urges switch to LNG to address climate concerns

Qatar has urged energy consumers across the globe to increasingly switch towards liquefied natural gas (LNG), which alone has four key characteristics to tackle environmental challenges.

Drawing attention to unprecedented recurrent climatic conditions, including mean temperatures, turbulent seasonal cycles and extreme events, HE the Minister of State for Energy Affairs, Saad biSherida al-Kaabi said it is time to take another look at natural gas and the number of advantages it has to make it a pivotal element in any strategy to tackle environmental challenges.

“It is versatile, flexible, economic, and clean. No other energy source can boast the combination of all these four qualities,” he told the 8th LNG Producer-Consumer Conference in Tokyo.

Al-Kaabi, who is also the president and chief executive of Qatar Petroleum, highlighted the country’s efforts to reinforce its position as the world's leading LNG producer, which include the North Field expansion to increase the LNG production capacity to 110mn tonnes per year by 2024, and a major ship-building campaign to build up to 100 LNG carriers over the next decade.

The LNG industry is very dynamic and invigorated, and it connects all corners of the world through hundreds of trade routes, and LNG receiving and regasification terminals, he said, adding, "we, in Qatar, are doing our part to keep this momentum moving forward for the benefit of our partner countries and their peoples."

Stressing that Qatar was collaborating with many countries around the world to ensure the security of their energy supplies and the sustainability of their economic growth, he said Doha is also working with customers, industry players, and stakeholders for a sustainable, affordable and secure energy supply for all.

"Most importantly, we are providing a sustainable energy solution to environmental and climate change concerns, and responding to widespread global moves towards cleaner and more cost effective fuels," he said.

Al-Kaabi pointed out that while Japan was celebrating 50 years since the arrival of its first ever LNG cargo, Qatargas has successfully delivered the 3,000th LNG cargo to JERA's Kawagoe Terminal.

The LNG Producer-Consumer Conference is a global annual dialogue, launched in 2012, and organised by Japan's Ministry of Economy, Trade and Industry, and the Asia Pacific Energy Research Centre.

It provides ministers, heads of international organisations, corporate executives, and other stakeholders with a venue to share the latest trends in the global LNG market and discussing opportunities and challenges with a view to its development.

Titans of business and politics pledge to fight global warming

Bloomberg/New York

Millions of people in 170 countries took to the streets to protest. World leaders lined up at the UN to pledge action. A 16-year-old girl, close to tears, shamed them for robbing her of a future.
The pressure to act on climate change is mounting. Titans of global business and politics gathered in New York this week for a series of events, including an unprecedented UN summit and the Bloomberg Global Business Forum, to acknowledge that more must be done — but fell short of saying exactly what will be done.

“Time is running out in the court of public opinion, because time is running out to address climate change,” New Zealand Prime Minister Jacinda Ardern told heads of state and business chiefs at the Global Business Forum on Wednesday. “It’s right for them to hold our feet to the fire.”

The stakes have indeed never been higher. Temperatures have already risen 1 degree Celsius (2 degrees Fahrenheit) since the 1880s. The world must limit that warming to no more than 2 degrees above Industrial Revolution levels, the UN has warned, to avoid the most catastrophic of droughts, floods, mass migrations and conflicts. “You can just feel the groundswell of popular sentiment, that the urgency of this is elevated,” Goldman Sachs Group Inc chief executive David Solomon said during the forum.

When asked whether there’s enough information out there to determine his own bank’s exposure to climate change, Solomon said, “We’re working on it. The answer is we’re working on it.” It was a response that underscored both the heightened awareness among leaders that they will be held responsible for global warming and the work that still lays ahead of them.

The meetings were still “far too much a chance for people to beat their chests and say they’re making change,” said Brad Cornell, a business professor at the University of California at Los Angeles. “But who is making real change?”

The UN pointed to some change that came from its Monday summit: 77 countries committed to cutting greenhouse-gas emissions to net zero by 2050; 70 countries pledged to bolster climate action plans by 2020; more than 100 business leaders aligned themselves with the goals of the international Paris climate agreement; and 12 countries vowed to contribute to a fund to help developing countries adapt to climate change.

Nobody says that’s enough. UN Secretary-General Antonio Guterres, who organised the summit and called on world leaders to announce real plans at it, said as presentations concluded, “We need more concrete plans.”

The UN-backed Intergovernmental Panel on Climate Change released a report Wednesday with alarming findings on fast-accelerating and potentially irreversible deterioration of oceans and glaciers.

While some of the world's most powerful leaders sounded off on climate in New York, a UN panel convened almost 400 miles (600 kilometres) away in Montreal to continue a years-long debate over curbing emissions from airplanes. The group may decide on what kind of system to use to regulate them – a laborious and highly political process that went largely unmentioned in Manhattan. And yet there were signs in New York that the tide is turning in favor of real action.

At the conclusion of Monday's annual meeting of the Oil and Gas Climate Initiative, an industry-supported group that also met in New York, the majority of the member CEOs stuck around for a discussion on climate change. In all, nine were present at the talk, including the bosses of Exxon Mobil Corp and Chevron Corp who faced questions from students and activists as well as reporters.

"And they were listening," according to Felipe Bayon, CEO of Colombia's state-run oil giant Ecopetrol. "I'm very encouraged. As a citizen of the world, I think that a lot of things are possible."

Credited for inspiring the millions of young people who've rallied around climate change in recent days is Greta Thunberg. The teenage activist sailed to New York on a zero-emissions boat, climbed the stage at the UN summit and told the crowd of more than 300 presidents, prime ministers, CEOs, bankers and delegates that they've let down her entire generation by not acting on climate change. "You have stolen my dreams and my childhood with your empty words," she said on Monday. "How dare you!"

Anand Mahindra, chairman of India's Mahindra & Mahindra Ltd, said Thunberg gives him hope, as do all of the young people calling for change. It took the youth of the 1960s protesting the Vietnam War to wake everyone up to the fact that the war needed to end, Mahindra said. He's hopeful, he said, that they can do it again to win the fight against climate change.

The movement grew so big that even US President Donald Trump, who has called climate change a myth and vowed to pull America out of the Paris pact, made an unexpected appearance at the UN summit. He stayed for 15 minutes and didn't speak. China President Xi Jinping didn't attend the summit at all — leaving the leaders of the world's two largest polluters visibly absent from the presenters' list.

During the Global Business Forum on Wednesday, business leaders repeatedly pointed the finger at government to step up and dictate what should be done. "The more there's a clear policy framework," Solomon said, "the more you'll get a reaction and response."

Samir Assaf, CEO of global banking and markets at HSBC Holdings Plc, had one idea: "The private sector can provide debt, and national development banks can provide guarantees." To which moderator Christine Lagarde, the incoming president of the European Central Bank, responded: "So, the public takes the risk and the private takes the profits."

Green investments are proving to be less of a risk and more of a moneymaker. Solar and wind power costs have plunged so deeply that they're now the cheapest and most profitable form of new electricity in two-thirds of the world. CEOs of corporations worldwide are saving billions by cutting their plastic waste, using less, cleaner and cheaper energy and recycling.

The world will face a serious test next year. Under the Paris agreement, countries are expected to submit new, and ideally more ambitious, climate action plans every five years. The next presentations are due in 2020.

"There's an enormous gulf right now,'' said Kelly Levin, a senior associate at the World Resources Institute in Washington, "between current momentum and where we need to be."

LNG investments hit record $50bn in 2019: IEA chief

Reuters Tokyo

Record investments of $50bn have turned 2019 into a banner year for liquefied natural gas (LNG), with Canada and the United States being the main drivers, the chief of the International Energy Agency (IEA) said yesterday.
The industrial sector is Asia’s biggest driver of LNG growth, with China expected to overtake Japan as the world’s top importer of the fuel in five years, said Fatih Birol, the agency’s executive director.
“This year, 2019 already broke the highest amount of (final investment decisions) for the first time ever, $50bn,” he told the annual LNG Producer-Consumer conference in Tokyo.
More than 170bn cubic metres (bcm) of natural gas liquefaction capacity is due to take a final investment decision this year, a record far surpassing the previous high in 2005 of 70 bcm, according to the IEA.
The recent boost in contracting activity and project sanctioning follows the growing adoption of the equity offtake

marketing structure, where companies have access to LNG volumes according to their equity stake, reducing the need for long-term sale and purchase agreements, the agency said in a report released this month.

“The biggest growth is coming from China,” Birol added. “In the next five years, about one-third of global LNG demand will come from China alone.”

While LNG imports by Japan, the world’s top buyer of the super-chilled fuel, and Korea are expected to stay important, slowing growth there means the biggest contribution will be from China, Birol said.

Other Asian nations, such as Bangladesh, India, Pakistan, Thailand are also importing more LNG. European LNG imports will also increase as domestic gas production declines and nations diversify supply, Birol said.

For instance, European natural gas production has halved over the past decade, increasing the call on other sources of flexibility, IEA said in the report this month.

The United States will make up two-thirds of global growth in LNG exports, which could turn pricing dynamics in Asia towards more gas-linked, rather than oil-linked LNG contracts, he said.

About 70% of LNG contracts are oil-indexed, with the rest geared to gas.

That could soon change to a 50-50 pricing mix, Birol added.

The Climate-Change Debate Has Shifted, Not Ended

Is there still a debate over climate change? Yes and no. As a scientific matter, the issues of whether it’s happening and who’s to blame are long settled. But there’s no end to debates about what to do about it. Arguments about the need for and costs of action are playing out against a nonstop, live-on-TV drama of the massive storms, record wildfires and deadly heat waves already fueled by global warming.

1. What’s new in the climate debate?

For one thing, there’s been a revolution in renewable energy. The price of wind and solar has plunged in a way even its most ardent backers wouldn’t have dared dream 20 years ago. Bloomberg NEF projects that by 2050, renewable power will produce two-thirds of the world’s electricity, the same fraction that fossil fuel produces today. The world’s biggest polluter, China, is taking far more aggressive action to reduce greenhouse gas emissions than was expected even a decade ago. A combination of slower economic growth and a drive for cleaner air have put China ahead of schedule for its emissions to peak by 2030.

2. How has the debate shifted?

There's robust argument over how to balance the effort put into mitigation versus adaptation. Mitigation gets most of the attention — the headline news from the 2015 Paris climate accord, for instance, was about the pledges different countries made to limit the release of greenhouse gases. But adaptation is becoming a pressing need as temperatures rise. Some communities are already trying to relocate away from rising waters. Storm-surge barriers and flood gates geared to climate change have gone up in Rotterdam and Venice. New York installed gates after parts of the city were inundated by the surge driven by super storm Sandy in 2012, and Houston, flooded by Hurricane Harvey's torrential rains in 2017, is considering new defenses. Even steps as small as providing air conditioners for the poor can play an important role in making cities livable in a hotter future.

3. What's the status of the Paris agreement?

Even though President Donald Trump intends to pull the world's biggest economy out of the accord, the U.S. is still participating in nuts and bolts discussions on implementing the voluntary pledges made by almost 200 countries. Coalitions of cities, states, businesses and universities in groups such as We Are Still In and America's Pledge have organized to keep progress going in the U.S. even if the country formally leaves the pact. (America's Pledge was co-founded by Michael R. Bloomberg, the founder and majority owner of Bloomberg LP, the parent company of Bloomberg News. He has told the New York Times that he is considering a campaign for president.) The U.S. is currently seen as on track for its climate goals for 2020 but falling short of its longer-term pledges, as are the European Union and Japan, according to Climate Action Tracker, a research project.

4. What’s Trump’s argument?

Money. Trump said the Paris pact would hurt American workers and amounted to a “massive redistribution” of wealth from the U.S. to other countries. Meeting the Paris goals would conflict with his efforts to revive U.S. coal production. He’s also moved to water down fuel-efficiency standards and proposed rolling back Obama-era regulations meant to force utilities to reduce emissions. Officials in his administration insist that U.S. economic growth is a more urgent priority than climate change.

5. Who’s agreeing with him?

Influential groups of voters in countries where a shift away from dirty fuels has raised energy prices. In Australia, Malcolm Turnbull was pushed out as prime minister in August after conservatives in his party rebelled over his plan to write the country’s Paris targets into law. Canadian Prime Minister Justin Trudeau in 2015 bowed to pressure to allow pipelines carrying carbon-heavy oil from tar sands to be expanded. Now his plan for a national carbon price to drive down emissions is under attack and is expected to be a focus for his opponents in 2019 elections.

6. How much would meaningful action cost?

It’s hard to know, and there’s a wide range of forecasts. The Deep Decarbonization Pathway Project, a research effort backed in part by a United Nations group, estimates that for 16 leading countries, meeting their Paris targets would require investments amounting to 0.8 percent of gross domestic product a year by 2020 and 1.3 percent by 2050. The International Finance Corporation has estimated that the Paris accord opened up $23 trillion in investment opportunities for government and private industry by 2030. BNEF projects that half that much will actually be spent. Developed nations have committed to boost climate-related aid to poorer countries to $100 billion a year by 2020, including money from both public and private sources.

7. What are the stakes?

Because the warming process is cumulative, if by some magic all greenhouse gas emissions stopped tomorrow, researchers predict we may still be in for 1.5 degrees Celsius (2.7 degrees Fahrenheit) of warming this century — three times as much as we've seen since the mid-1990s. Climate Interactive, a research non-profit, calculates that even if the Paris pledges are met, we'd blow past the target of holding warming to 2 degrees above mid-19th century levels. If current emissions levels aren't reduced, warming could gallop past 4 degrees. Studies have projected changes ranging from more kidney stones, smaller goats and less sex in the short run, to swamped cities and widespread extinction of species in the decades ahead.

Italian Alpine glacier close to collapse, officials warn

ROME: Part of a massive glacier on the Italian side of the Mont Blanc mountain range is close to collapse after accelerated melting in the late summer heat, officials at a nearby town warned Wednesday.

This is the latest of a series of warnings about melting glaciers – in the Alps and elsewhere – as concern grows about the effects of climate change.

The mayor of the town of Courmayeur has ordered a local access road closed at night and limited access to the region below the glacier, which is popular with tourists, a town spokesman told AFP.

Town spokesman Moreno Vignolini dismissed “apocalyptic” reports in the media that it was threatening to smash down on the town itself. Below the glacier, he said, “there are no homes, only a few unoccupied chalets”.

Part of the Planpincieux glacier in the Aosta Valley is in danger of crashing into a valley running parallel to the Courmayeur valley, said Vignolini. “With the strong heat this summer, there has been between August and the first half of September, an acceleration of the melting of the glacier, at an average rate of 35 centimetres (14 inches) a day, up to highs of 50-60 centimetres on some days,”

The chunk of the glacier concerned, which makes up between a fifth and a sixth of the total and weighs around 250,000 tonnes, was threatening to break away and crash down into the valley, he added.
“There is a problem with a part of the Planpincieux glacier located at Val Ferret, which is thought to be falling due to a large fracture between the, say, stable part of the glacier and this part,” the mayor of Courmayeur, Stefano Miserocchi, told AFP.
Late on Tuesday Miserocchi ordered the night-time closure of the access road to Val Ferret, on the Italian side of Mont Blanc.
He has banned walkers from the area below the glacier, which is popular with visitors and has three mountain refuges.
Experts at the Fondazione Montagna Sicura (Safe Mountain Foundation), who have been monitoring the glacier for the Val d’Aosta region since 2013, alerted local officials to the latest developments.
“This glacier is atypical because it’s temperate, and so is influenced by the temperature of the water flowing below, which particularly exposes it to the global warming in progress,” said the foundation’s secretary-general Jean Pierre Fosson.
But he cautioned against alarmism, stressing that the preventive measures taken so far were for an “unprecedented situation” for a glacier in the region.
While it might break off in a single block, it could just crumble away or not break away at all, he added.
The Foundation monitors 180 glaciers in the Val d’Aosta region and this kind of thing is unavoidable, said Fosson. “Every year we see two square kilometres (0.8 square miles) of ice disappear” he said. “And it is getting worse with the increasingly hot summers and autumns.”

According to a landmark assessment approved by the 195-nation Intergovernmental Panel on Climate Change (IPCC), accelerating melt-off from glaciers and Earth’s ice sheets atop Greenland

and Antarctica are driving sea level rise. Since 2005, the ocean has risen 2.5 times faster than during the 20th century, threatening island nations and coastal cities. The rate at which the waterline rises will quadruple again by 2100 if carbon emissions continue unabated, the report found. On Sunday, dozens of people dressed in black attended a symbolic funeral march on a Swiss mountainside to mark the disappearance of an Alpine glacier on Pizol mountain. A study by Swiss researchers released earlier this month suggested that the Aletsch glacier – the largest in the Alps – could disappear completely by the end of the century if nothing was done to rein in climate change.

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.