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Policy, technology, company strategies, and the COVID-19 wildcard

Seven trends to watch for in global power
and renewables in 2020



Entering 2020, we expect government decisions around power market reform, subsidies, and long-term planning to set the pace for the energy transition. At the same time, government ambitions will be complemented, if not expedited, by corporate sustainability goals, reacting to shareholder pressure for action on climate change and advantageous renewable economics.

We estimate that there will be over 185 GW of net additions in grid-connected solar and wind in 2020—8% more than in 2019—accounting for about 65% of all net power capacity additions. Coal and gas, on the other hand, are projected to account for only 9% and 16%, respectively. These additions and the extent to which government and corporate ambitions are realized will depend on three interconnected drivers: policy, technological advancements, and new business strategies and revenue streams. This paper outlines the seven trends that stem from these drivers as well as unexpected market shocks (see Figure 3).

Figure 1

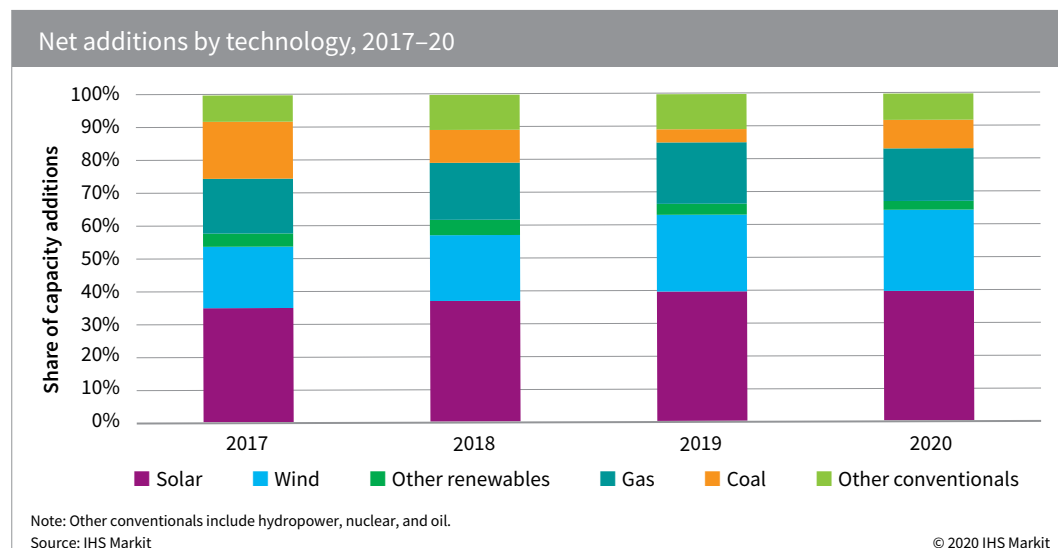


Figure 2

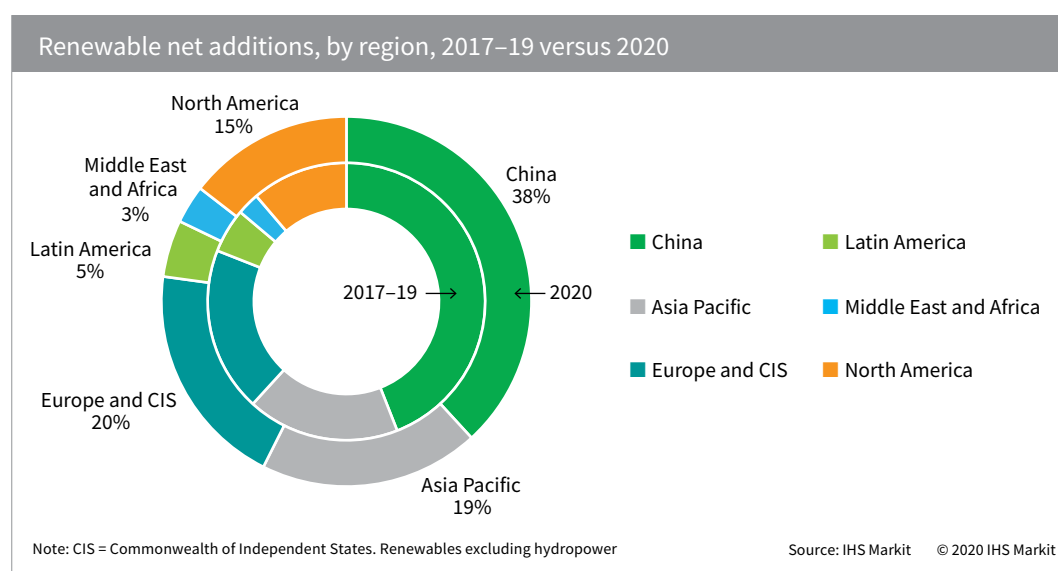
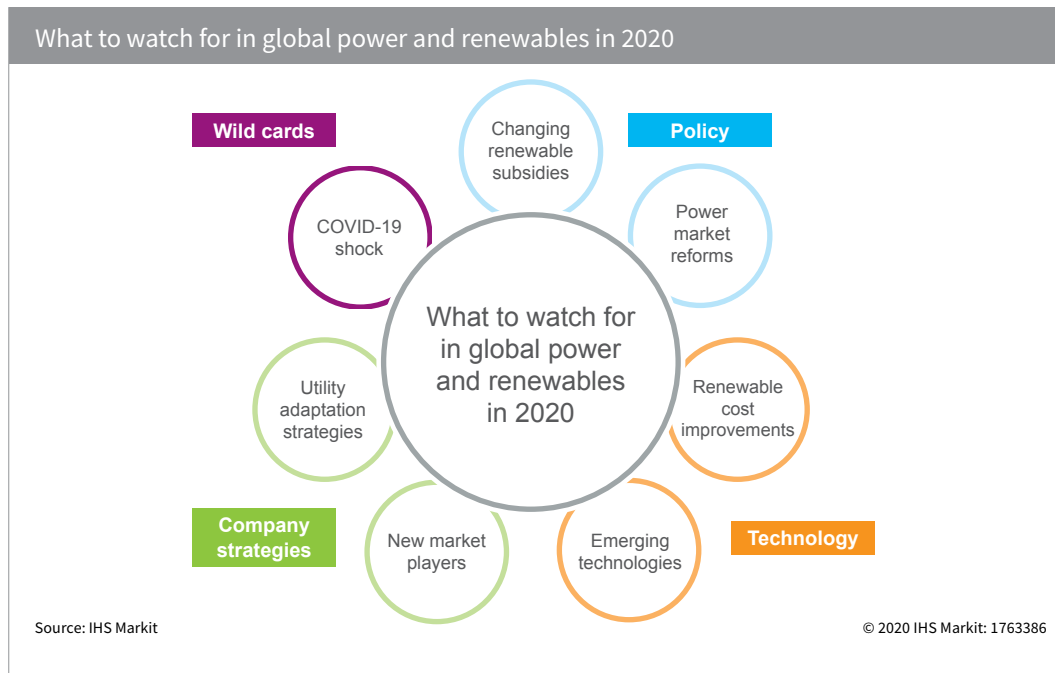


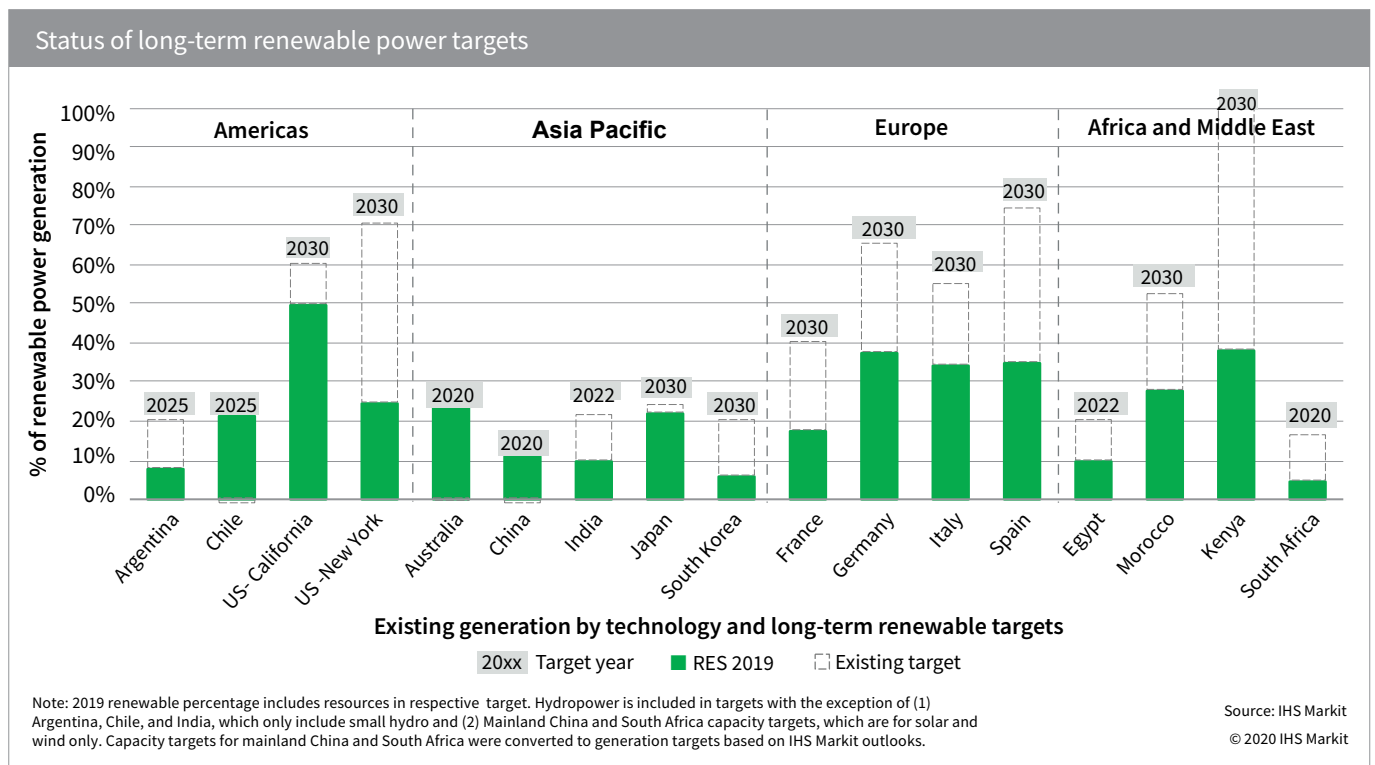
Figure 3



1. Subsidy mechanisms are growing up

A growing number of governments are seeking to rely on renewables for at least 50% of their midterm power supply, with an increasing number achieving renewable targets ahead of schedule (see Figure 4).¹ In addition to national and subnational commitments, governments are taking part in regional pledges, including the European Union's commitment to reach 32% renewable energy by 2030 (equivalent to at least a 50% power target) and the recently announced Latin American target of 70% renewable energy by 2030, a goal comprising the economies of Chile, Peru, Ecuador, Costa Rica, Honduras, Guatemala, Haiti, the Dominican Republic, and Colombia. The pace of renewable capacity additions and penetration will be determined by changes to subsidy mechanisms and ongoing power market reform efforts.

Figure 4



Renewable technology cost declines are not only fueling more ambitious renewable targets but also government commitments to reduce direct subsidies. However, the extent to which government support is lifted varies significantly across regions and impacts the attractiveness of new renewable projects in 2020.

Most markets have already shifted from feed-in tariffs (FITs), in pursuit of market-driven pricing through renewable auctions. However, key markets such as China, Japan, and Vietnam will sustain solar and wind FITs or FIT caps into 2021.

- China shifted from a FIT mechanism to a technology-specific renewable auction mechanism in 2019. However, the government still announces FITs for each technology as bidding caps, which are under gradual decline. As a result, onshore wind developers are rushing capacity build-out to capture the subsidy before it is eliminated in 2021. Similarly, offshore wind investors hasten project construction to qualify for the high FIT. The ability and willingness for wind manufacturing capacity to expand will determine the pace of wind power installations in 2020.
- Japanese FITs remain the main mechanism for renewables in the country. However, the government plans to shift to more market-based mechanisms as technologies mature and costs decline. The FIT for solar has gradually been reduced, and industrial-scale projects (greater than 10 kW) have already shifted to an auction mechanism. At the same time, subsidies for newer technologies, such as offshore wind (floating platform), will continue to enjoy a generous subsidy of \$328/MWh as the government continues to promote its development.
- Vietnam transformed from a country with no utility-scale solar projects to one with about 5 GW of solar capacity over the past 18 months owing to a \$93.5/MWh FIT. However, the FIT expired at the end of June 2019, and going forward the government plans to transition to auctions. The first pilot auctions will be conducted in 2020, alongside a reduced FIT for approved projects. The proposed auction design is meant to address grid connection and curtailment risk. Therefore, the response to the pilot will be a key determinant in whether Vietnam's plan for 12 GW of solar by 2030 can be achieved as well as the attractiveness of the market post-FIT to foreign investors.

At the same time, seasoned auction markets are going a step further by complementing technology-specific auctions with mixed-technology auctions, where various renewable technologies will compete head-to-head (e.g., Denmark, Finland, France, Germany, and Ireland), or continuing technology-neutral auctions, where all technologies compete in the same auction (e.g., Brazil and Chile). Interestingly, Latin America, with a long history in renewable auctions, is increasingly commercializing projects with a mix of auction, merchant, and bilateral financing, rather than fully depending on auction power purchase agreements.

FITs are not the only direct subsidy mechanism changing. The United States, which accounted for more than 20% of onshore wind additions in 2019, committed to phase out the most impactful wind subsidy, the federal Production Tax Credit (PTC), by 2019. However, the PTC gained an extra year through an extension signed at year-end, allowing wind projects that begin construction before the end of 2020 to attain 60% of the PTC's original value.

As direct support mechanisms are reduced, renewable quotas and green certificate programs continue to be launched or extended in growth markets (e.g., South Korea, the Philippines, and China).

Markets are shifting from direct subsidies, but **China**, **Japan**, and **Vietnam** will maintain FIT features into 2021





2. Market reforms to address reliability during transition

As we step into 2020, we expect more power market reforms to address security of supply concerns and the rising penetration of renewables.

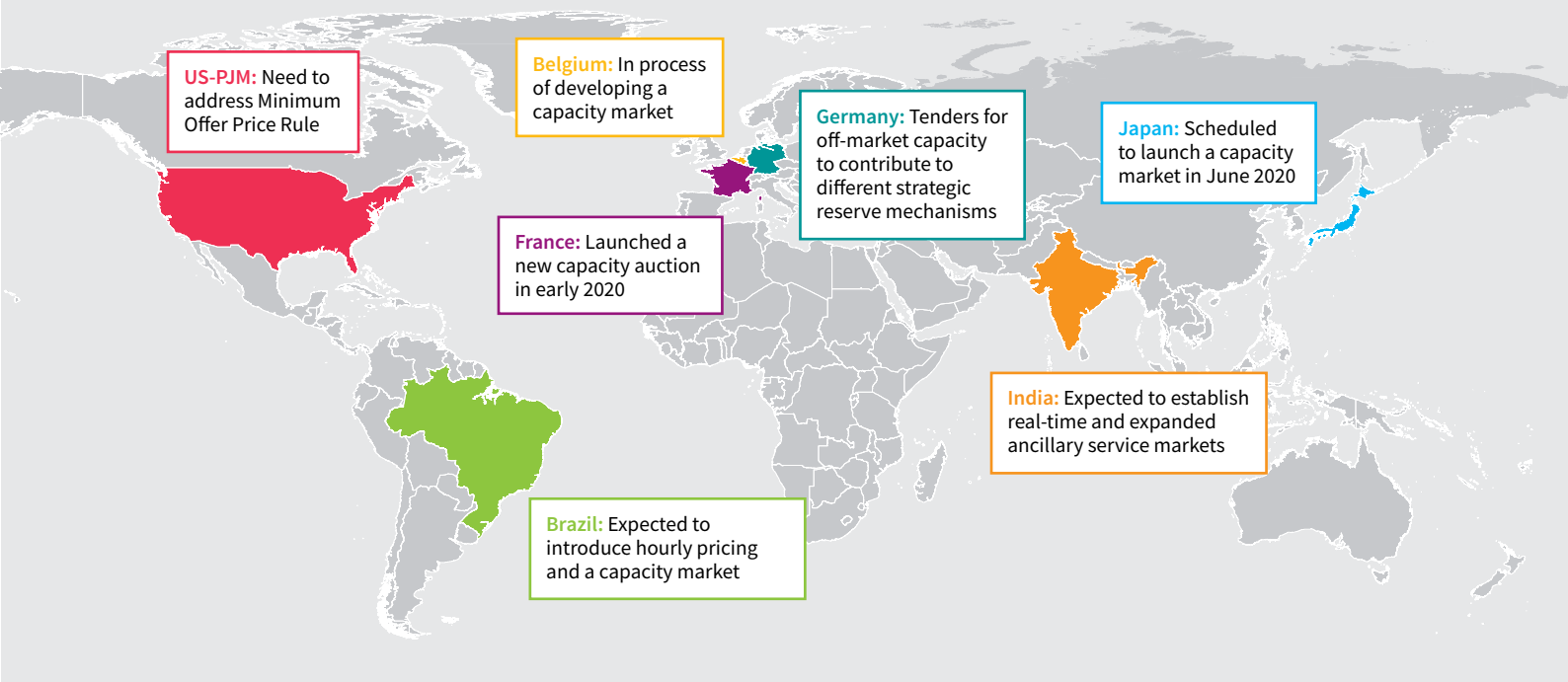
Markets such as Brazil, Japan, Vietnam, India, and Belgium will continue to revise recently designed wholesale markets or market designs to attract investment in the power sector. In the process, these newly competitive wholesale markets aim to establish mechanisms to address the need for capacity and balancing services.

- India, one of the largest power markets, is expected to establish real-time and expanded ancillary service markets in 2020 to improve operational flexibility for thermal generators and distribution companies.
- Brazil is expected to continue with its effort to privatize large state-owned power players, as well as introduce hourly pricing and a capacity market.
- Japan commenced its base-load power auction in July 2019 and is scheduled to launch a capacity market in June 2020. Furthermore, the power futures contract commenced in September 2019.
- Belgium is in the process of creating a capacity market to deliver investment in new thermal capacity to replace the closing nuclear fleet by 2025.

Emerging markets' focus on capacity and ancillary services is partly driven by lessons learned in more established markets.

Power market reforms in **India**, **Brazil**, **Japan**, **Belgium**, **Germany**, **France**, and the **US** are underway

Power market reforms to ensure security of supply are underway



Europe and North America are witnessing lower wholesale power prices owing to low gas prices and growing renewable penetration. As a result, coal and nuclear plants are under increasing economic pressure. This pressure, alongside policy pressures in Europe, is driving an accelerated pace of retirement. The changing grid mix is supplementing fuel risk with weather risk, and markets are taking various approaches to ensure reliability amid the low-carbon transition.

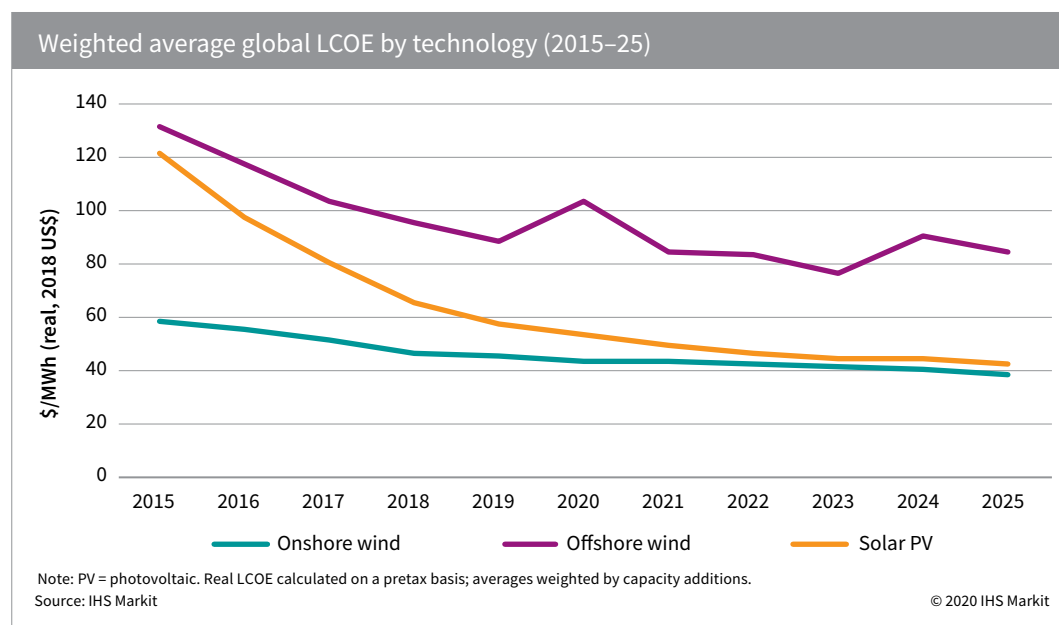
- As Germany, the largest European power market, faced negative power prices and depressed revenues for peaking assets, the national regulator launched tenders for off-market capacity to contribute to different strategic reserve mechanisms. However, there is uncertainty over whether strategic reserves will be enough to ensure investment, or whether a more comprehensive capacity remuneration mechanism—such as those being implemented in Poland and Italy in which all generation, demand response, and imports can participate—is necessary.
- France launched a capacity auction for new firm, zero-carbon capacity in early 2020 to ensure security of supply in the coming years, as coal plants are retired: 253 MW of new storage and 124 MW of demand-side management capacity were selected for a seven-year capacity contract.
- PJM, the largest power market in the United States, will need to address the Federal Energy Regulatory Commission's December 2019 order to establish a Minimum Offer Price Rule in an effort to negate state subsidies from capacity bids. Uncertainty over PJM's interpretation of the rules, the impact to capacity prices, the resources clearing the market under new prices, and potential oversupply resulting from the order will hang over 2020.
- At the same time, energy-only markets, the Electric Reliability Council of Texas (ERCOT) and Alberta, continue to tweak their rules but resist forming organized capacity markets. Power price volatility, necessary to incentivize new build, will test their design constructs.

3. Renewable cost declines: No end in sight

Renewable costs will continue to decline in 2020, and convergence across markets and technologies will accelerate. As a result, IHS Markit expects renewables' levelized cost of electricity (LCOEs) to be within the range of marginal fossil fuel costs in an increasing number of markets (see Figure 5).

While renewables will continue to benefit from a range of drivers for further cost reduction including technological improvements, economies of scale, and increased efficiency across the supply chain, regulatory constraints to firm renewable generation are expected to increase in the future.

Figure 5



IHS Markit expects **renewables' levelized cost** of electricity to be **within the range** of marginal **fossil fuel costs** in an increasing number of markets



4. Technological innovation to accelerate

Reductions in renewables generation cost will continue to be driven primarily by a drop-in capex, with technology continuing to play a key role. Cost reduction will come from the diffusion of new production processes for PV modules as well as new turbine designs and the adoption of best practices in engineering, procurement, and construction (EPC) and design across newer markets.



Bifacial solar panels are entering the mainstream for PV, as illustrated by the 800 MW Al Kharsaah Total project in Qatar announced in January 2020.



Abundant low-cost renewable generation will have to better match demand profiles to ensure the reliability of power systems. As a result, **battery storage** will continue to grow rapidly, with all trends pointing to a maturing battery industry that is well beyond the demonstration phase.



Onshore wind will continue to focus on improvements in technology and operations and maintenance practices to help extend the current 20-year useful life of wind turbines. Declines in capex will be driven by scale of operations and turbine platform modularity, which will enable standardization of subcomponents ultimately leading to sizable supply chain cost savings.



Technology will continue to play a key role in driving down the cost of **offshore wind**. All major offshore wind turbine manufacturers, including Siemens Gamesa, MHI Vestas, and GE Renewable Energy, have now two-digit megawatt models in their portfolios, and all three expect them to be commercially available from 2021 onward.

Floating offshore wind is slowly taking off. The first 8.4 MW turbine of the 25 MW WindFloat Atlantic project off the coast of Portugal—developed by ENGIE, EDP Renewables, Repsol, and Principle Power—has been recently connected to the grid, and the consortium expects the floating farm to be fully commissioned over the course of 2020. This will be a major milestone for the floating wind industry as these are the largest turbines ever to be installed on a floating platform. European utilities, oil and gas, and EPC companies have already entered the floating space. IHS Markit expects activity in the floating offshore wind industry to continue to grow in 2020.

Reductions

in renewables generation **cost** will continue to be driven primarily by a **drop in capex**, with **technology** continuing to **play a key role**

5. New stakeholders: Testing the competitive edge

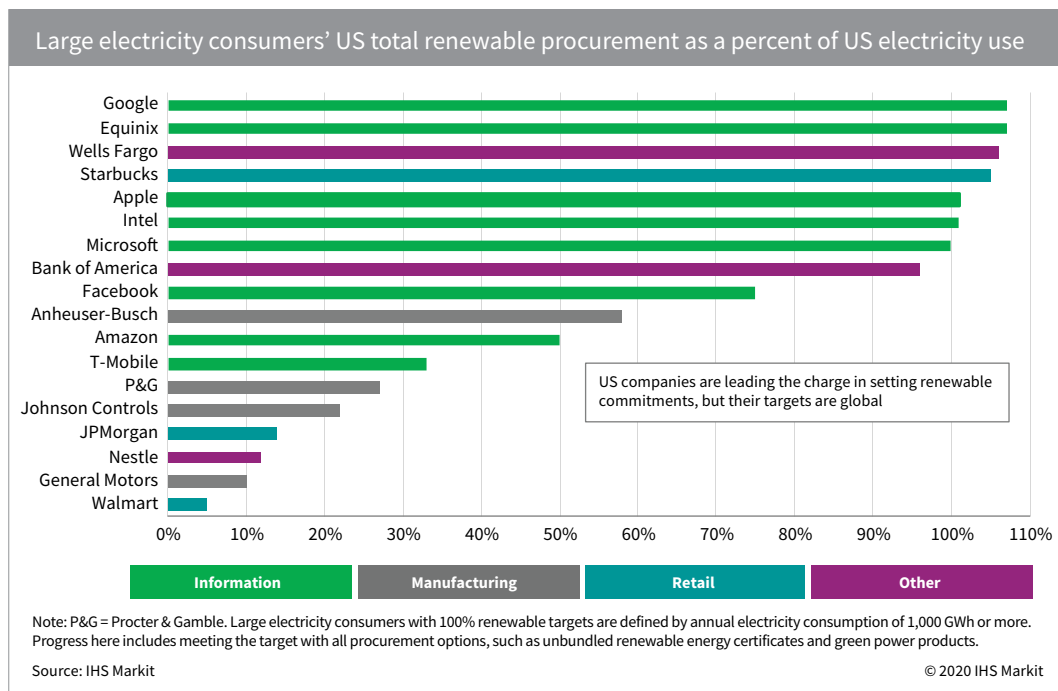
Governments are not the only ones committing to procure renewable energy. More than 200 companies have formally committed to RE100, a global corporate initiative to cover electricity usage with 100% renewables before 2050 (see Figure 6). Of the 211 members, more than 50 joined in 2019, marking a record year.

However, it is not just corporate targets that reached a record, but actual corporate-driven renewable procurement, which more than doubled in 2018 and then hit another record in 2019, with more than 8 GW of announced projects in the United States alone.

The result has not only been an increase in renewable contracting but also shifting market designs as corporations push for retail-choice options that would enable corporations to sign renewable power purchase agreements directly with developers. We expect some movement in retail competition in markets such as India, South Africa, and China in 2020.

More than **200** corporations have committed to 100% renewables

Figure 6



6. Utilities: Seeking adaptation strategies

Revenue streams for power generators are evolving as governments move toward competitive bids and renewable price cannibalization puts merchant power markets under continuing pressure. As a result, utilities are adapting their business strategies to compete in such an environment and trying to capture new revenue streams generated by new stakeholders.

While auctions play an increasingly dominant role globally, some developers are diversifying their revenue stream by taking a step back from oversubscribed auctions and shifting attention to commercializing power in the free market via bilateral contracts or, if they are vertically integrated, by leveraging their retail client base.

In developed and emerging markets, the corporate renewable surge has created new opportunities. In Brazil, for example, large consumers continue to move to the free market and self-supply rather than depend on the regulated market for energy. However, duration of regulated and corporate contracts is shortening, so we also expect a continuation of a trend initiated some years ago in which more renewables gain increasing merchant exposure, including in ERCOT, Chile, Mexico, the United Kingdom, France, Spain, Portugal, Italy, Germany, and the Netherlands.

In addition to new revenue streams, the convergence of renewable costs is forcing utilities to rethink their value proposition to compete. As competition in the sector increases, margins continue to be squeezed, placing additional pressure on companies to establish strategies that reduce costs and capture new markets by obtaining scale across regions, technologies, and segments of the value chain. As a result, we expect a continuing shift in utility strategies in 2020, particularly for global players.

Renewables gain increasing merchant exposure, including in **ERCOT, Chile, Mexico, the United Kingdom, France, Spain, Portugal, Italy, Germany, and the Netherlands**

7. COVID-19 virus shock: Intensified fuel competition

The year 2020 will be remembered for the ripple effects of the coronavirus disease 2019 (COVID-19). IHS Markit expects the virus to reduce global economic growth from our pre-outbreak outlook of 2.5% to the current outlook of just 1.7%.

This will in turn decelerate electricity demand growth and lead to intensified competition among coal, gas, nuclear, and renewables in many markets.

Most notably, we have adjusted the load growth of the world's largest power market, China, downwards by 1% in 2020 owing to reduced activity in commercial and industrial sectors. This one percentage difference in outlook equates to about 73 Terawatt-hours of electricity, which is roughly equal to the annual electricity demand of Finland.

Although existing renewable generation will be less impacted than conventional technologies in China, renewable capacity additions will feel a bigger impact, particularly wind, which is tight on manufacturing capacity. The result is greater pressure on wind developers with large supply chains in China. Similarly, the solar supply chain, particularly cell and module nodes – currently dominated by Chinese players – has been severely disrupted during the first quarter. Even as factories start to open, we expect delays in transportation, component procurement, and manufacturing ramp-up to continue, with worldwide impact.

In Europe, the region currently hardest hit by COVID-19 outside of China, the main impact on the power market is expected to arise from weak gas prices and the potential for lower demand. Gas may see periods in which generation is increased to create demand for incoming gas deliveries, resulting in very low power prices on days when renewable (especially wind) generation is high. Coal is expected to run at very low levels throughout the summer.

In countries where gas is at the margin in power markets – Italy, Spain, and the United Kingdom – reductions in power demand would lead to a drop-in gas consumption. In countries where coal and lignite are at the margin – Germany and Poland – reductions in power demand would exacerbate already challenging conditions for these plants. Lower power prices will also hit the revenues of nuclear and merchant renewable assets as well.

As we move further into 2020, the IHS Markit global team of researchers and experts will continuously monitor how these seven key trends are shaping the global power and renewables sector and provide relevant research updates.

IHS Markit expects the virus to **reduce** the **load growth** of the world's largest power market, **China, by 1%** in 2020



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