

A large, colorful graphic composed of various geometric shapes and icons representing energy and technology. The central focus is the text 'WE MO' in large, white, bold letters on a dark purple background. Surrounding this are icons for a power line tower, solar panels, a wind turbine, a car, a battery, and gears. The background is a mix of blue, purple, and green tones with abstract patterns like dots and lines.

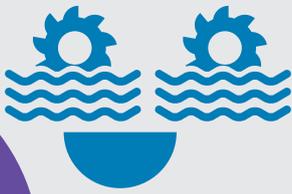
WE
MO

World Energy
Markets Observatory

Key Takeaways

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North America: Transforming the energy sector at speed and scale

COVID-19 has inadvertently led to the “urgent and unprecedented” action the scientific community has recommended to mitigate the long-term effects of climate change. At the peak of the pandemic, the world saw a reduction in greenhouse gas emissions (GHG) by an average of **26 percent**¹ due to reduced energy consumption, travel restrictions and a downturn in industrial activity.

But any celebration of that point was misplaced. Not only did these reductions come at a tremendous cost in terms of mortality, human suffering, economic hardship and social strain, but our research also confirms that this progress was merely temporary. As the world emerges from this crisis, emissions are rebounding in time with the resumption of daily life and work.

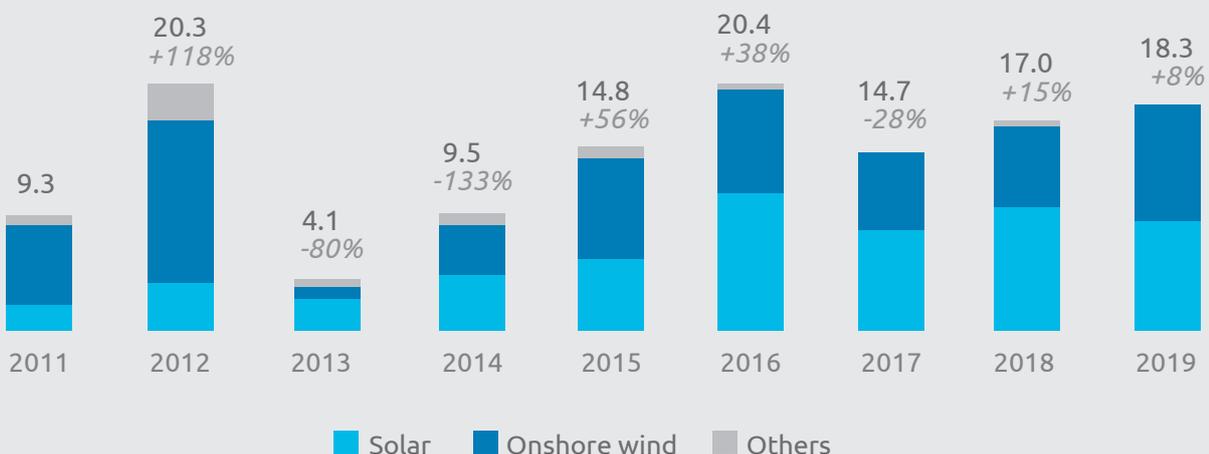
And yet, despite the gravity of this situation, we can and should recognize in this event the world’s collective ability to change at speed and at scale. While our collective response to COVID-19 was never designed to be sustainable, it demonstrates that our industry, and our world, are capable of massive, rapid transformation.

Perhaps more importantly, public sentiment on the need for change and its urgency may have finally started to shift as the sharp downturn in global travel, commuting and industrial activity has cleared air and waterways around the world. Through the unfortunate reality of the pandemic, people are finally recognizing the stark and direct relationship between their day-to-day activity and the environment.

This year’s **World Energy Markets Observatory (WEMO)**, Capgemini’s annual thought leadership and research report that tracks the development and transformation of energy markets around the world, explores this issue further, highlighting solutions within the energy sector that could match the positive results garnered during the lockdown period without the tremendous cost to economic growth, mobility and lifestyle. Here we review some of the most high-value solutions offered by the energy sector to organizations across industries and around the world.

FIGURE 1

NET RENEWABLE POWER CAPACITY ADDED IN THE US, 2011-2019 (GW)



¹ <https://www.nature.com/articles/s41558-020-0797-x>



Increased use of renewable energy sources

Global investments in wind and solar energy remain steady with worldwide commitments increasing three percent between 2018 and 2019. In the U.S., the Energy Information Administration (EIA) expects 42 GW of new capacity additions to start commercial operation in 2020 with solar and wind representing just over three-quarters (76 percent) of these additions.

Perhaps more importantly, the declining costs for renewable electricity, particularly as it relates to solar PV and wind, is expected to facilitate further investments. In North America, solar and wind energy have seen such major cost-efficiency gains within a decade that they are quite close to outcompeting existing coal and nuclear plants. For example, unsubsidized utility-scale solar levelized cost of energy has plunged to just \$36-44 in 2019, as compared to \$323-394 in 2009.

However, COVID-19 may negatively impact installations in 2020 as the global supply chain is disrupted and imports from China are severely affected. Further, current-year tax credits in the U.S., which spurred some 2019 investments, leave open the possibility that U.S. renewable efforts will be scaled back in the future. In this year’s research, we see the need to seize the opportunity of renewables and plan ahead to address these and other challenges.

Grid modernization and next-generation advanced metering infrastructure (AMI)

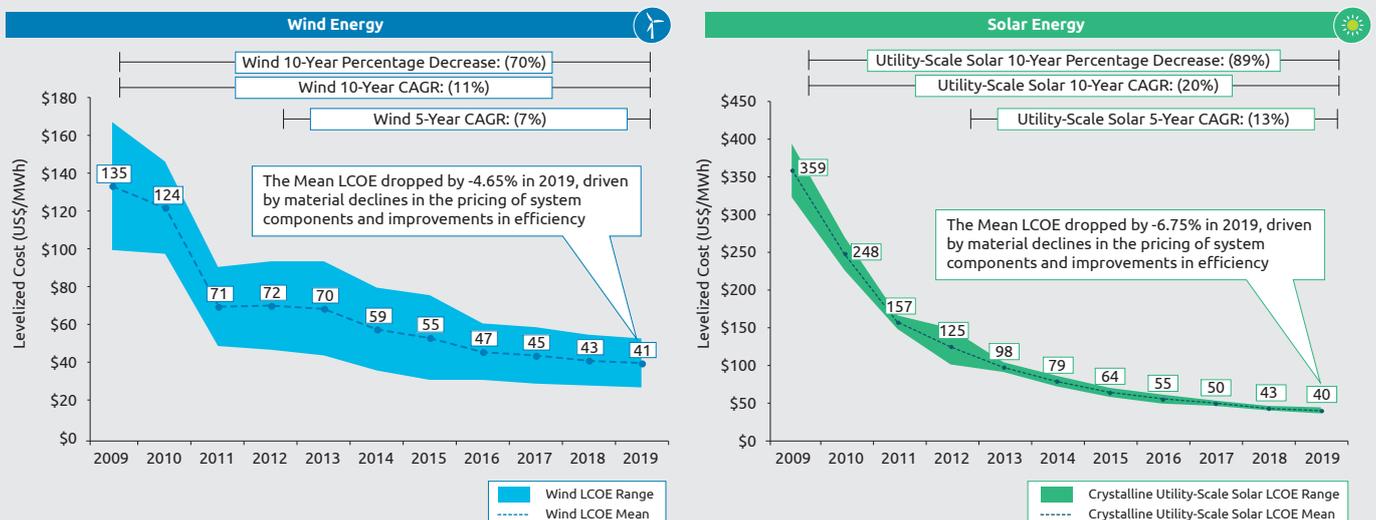
The increased use of intermittent renewables around the world raises questions about the stability of the grid. In the U.S., this issue came to a head in August 2020 as California, which serves one-third of demand through renewable sources, experienced rolling blackouts due to a so-called “perfect storm” of conditions: high temperatures across the region, which prevented other states from contributing electricity to California; diminished output from renewable sources, particularly solar during evening hours; weather-related disruptions at fossil-fueled power plants; and, in some cases, plants going offline.

Unfortunately, this challenge will intensify as California increases its renewable energy target to 60 percent by 2030 and phases out fossil fuel and nuclear plants schedulable generation. As such, we see a need for generation redundancy, battery storage, and efficient demand response systems to incentivize customers to reduce their consumption or change behaviors.

More importantly, this issue also underscores the need for grid modernization and the at-scale deployment of the smart grid—essentially establishing a two-way communication between energy generation sources and end users to better manage supply and demand. To do this, energy organizations

FIGURE 2

US – HISTORICAL ALTERNATIVE ENERGY LCOE DECLINES, 2009-2019 (US\$/MWH)



will need to plan additional line constructions, leveraging fiber instead of copper, to connect renewable energy sources to the grid. Organizations that have not already done so should also deploy a next-generation advanced metering infrastructure (AMI)—an integrated system that incorporates smart metering, smart analytics and smart grid capabilities to enable a variety of new and valuable customer and stakeholder services enabled by the smart grid. Through the smart grid and its underlying technologies, infrastructure and components, organizations can support a host of business transformation and sustainability initiatives by enabling two-way flows and real-time load-demand balance.

Advancing the transformation agenda

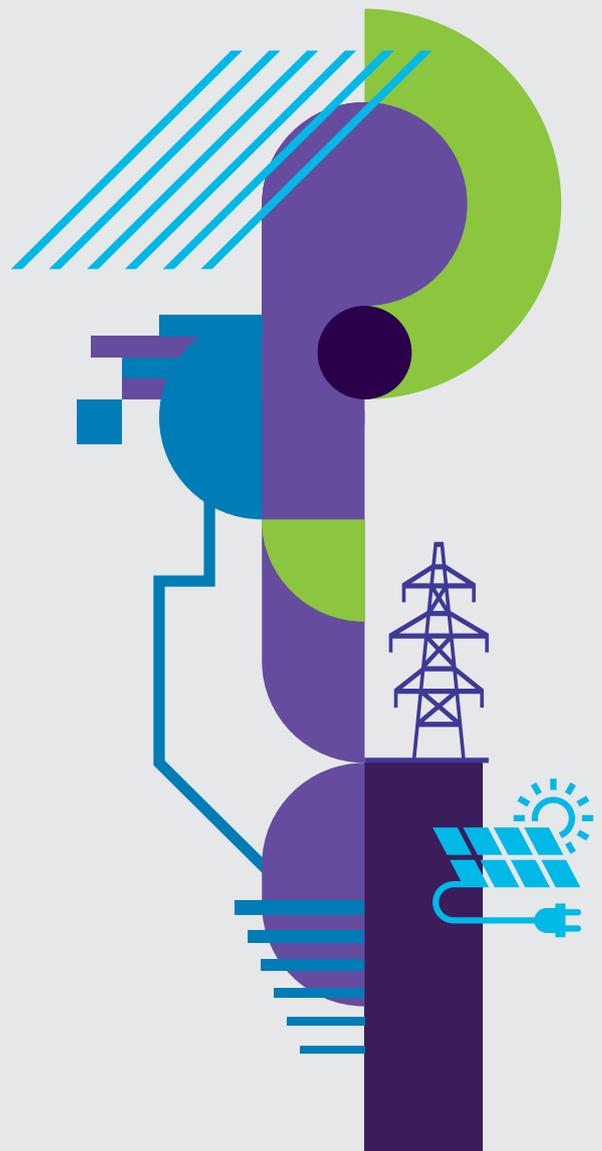
For energy organizations, energy transition is the top priority. However, the path to achieving that goal is far less clear as the transformation strategy will vary across organizations.

While increasing the share of renewables and grid modernization will play a big role in industry transformation in the U.S., our research identifies many other areas of promise, including: corporate purchase power agreements (PPAs); green or renewable hydrogen; and electric mobility, particularly as it relates to public transportation. To fully enable these solutions, the energy sector will need to improve collaboration, engaging technology organizations, government agencies and the investment community to formulate an effective transformation plan that addresses digital, financial and policy considerations.

To review the full findings from the 22nd Edition World Energy Markets Observatory, download a copy of the report today.

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We conclude this year's WEMO with a now-familiar call for radical change to address climate change. While virtually every organization understands what's at stake, companies' transformation plans tend to be far more conservative, as the business grapples with costs, risk and returns. In publishing our WEMO report, we aim to help organizations understand some of the latest digital and sector technologies, business models and data and analytics that could help shape a high-value transformation agenda.





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