

A Bright Future for the Solar Industry: 2021-2025 Outlook

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LOAD BANK SOLUTIONS

The Solar Energy Industry in 2020

Despite the impacts of COVID-19, global projections for solar energy are on an upward trend. As global energy demands decreased in 2020, renewables were the **only electricity-generating source to record growth** with the **biggest gains in solar and wind**. The International Energy Agency (IEA) also announced in 2020 that in countries with favorable policies and climates, solar is now the **cheapest source of electricity in history**.

In this white paper, we discuss how the momentum of 2020 will set the solar industry up for success for years to come. Follow along as we highlight areas of growth, trends and how investors and facility owners can prepare for IEEE standards that require adjustments to the solar commissioning process.





Area of Growth: Non-Residential PV

While non-residential solar was initially slowed by delays from COVID-19, new project outlook is healthy through 2023.

In 2020, non-residential solar saw its **lowest quarter of installations** since 2016. Due to shelter-in-place orders, a majority of the scheduled non-residential solar projects either had to halt construction or delay utility interconnection timelines.

In 2021, all delayed projects are expected to launch again with an estimated 35% increase in overall capacity. As shelter-in-place restrictions are lifted and commercial project construction being deemed an essential activity, construction and interconnection processes have begun to proceed as normal. New project origination for non-residential solar is expected to remain healthy out to 2023, when the solar investment tax credit (ITC) is set to expire.

Solar programs in Virginia and Maine are also expected to bolster the non-residential installation pipeline. Maine's Net Energy Billing program and Virginia's **recent expansion** of their commercial pilot power-purchase agreement are two state-wide programs that incentivize medium to large-sized organizations to install PV systems to offset their electric bills and even sell electricity back to utility providers.



Area of Growth: Utility-Scale PV

Utility-scale PV capacity is predicted to reach 250 GW by 2030, pending financial stability in the broader global markets.

Overall, the utility PV market has been the least impacted solar sector of 2020. Nearly 2.5 GW of utility-scale projects **were installed in Q2 2020**, representing 71% of all solar capacity brought online that quarter. A total of 8.7 GW of new utility PV agreements were also announced in Q2 2020, bringing the contracted pipeline to a record total of 62 GW through 2023.

As utility PV is now cost-competitive with natural gas and other forms of power, it continues to attract investors in multiple markets, especially those states setting renewable energy goals. Roughly **half of the growth** in U.S. renewable energy generation since the beginning of the 2000's can be attributed to state Renewable Portfolio Standards (RPS). Currently there are thirty states and three territories that have adopted an RPS, with most targets falling between 10% and 45%. 14 states have requirements of 50% or greater. In the near-future, these states will likely see the greatest amount of investment in utility-scale solar power production.

The **Solar Energy Industries Association** (SEIA) predicts that there may be some uncertainty in solar investments in the long-term due to the unpredictable financial impacts of COVID-19. This could be a potential roadblock in funding utility-scale solar projects. For the near-future, smaller projects and less-established developers will likely have fewer overall opportunities as tax equity investors may be more cautious until the financial impacts of COVID-19 are fully known.

Trends: Solar Is Becoming More Affordable

Solar installation costs are decreasing worldwide.

Increasing economies of scale, favorable economic policies and breakthroughs in the efficiencies of solar panels are driving down the costs of solar PV every year. According to The International Renewable Energy Agency ([IRENA](#)) global installation costs of large-scale solar PV could reach (\$340 to \$834/kW (USD) by 2030 compared to **current costs of \$995/kW**. The IEA's **World Energy Outlook** 2020 report also says that solar is now cheaper than coal and, along with wind, could come to make up 80% of the electric energy market by the end of the decade.

Wood Mackenzie, a global energy consultancy based out of the UK, says that the cost of U.S. solar power is dropping faster than expected due to the **effects of coronavirus**. Residential prices are now expected to fall 17% over the next five years with commercial systems dipping 16%, and utility-scale installations declining 20%.



Trends: High-Efficiency Panels Workable at Scale

Mono PERC panels are now deployable at commercial and utility-scale.

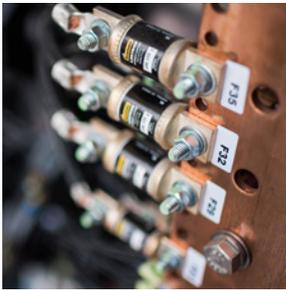
Solar panels built with PERC (passivated emitter and rear contact) cells incorporate an additional layer to the back of traditional solar cells, allowing more sunlight to be captured and converted at a 1% higher efficiency rating than standard modules. While this technology has been around [since 1989](#), recent market changes have improved its cost-effectiveness at scale.

Research from [Wood Mackenzie](#) shows that system costs for installing mono PERC modules for commercial and utility systems are expected to decline by 16% and 20% by 2025. Experts believe that this partly due to a major shift of the market towards monocrystalline cells and overall improvements in the reliability of this technology, which has spurred larger numbers of manufacturers to pursue PERC production.

Global electricity production from mono PERC modules is forecasted to reach [168 GW by 2022](#).

Trend: New Solar Technology on the Horizon

Agrophotovoltaics (APV), while still early in development, have the potential to serve as breakthroughs for the solar industry.



AGROPHOTOVOLTAICS

Traditional solar panels perform optimally at temperatures under 77° Fahrenheit, meaning most farms lose out on potential energy as it gets hotter. Agrophotovoltaics, the concept of building solar panels and farm crops in tandem, counts on water evaporation from underlying crops to help cool down the surrounding panels and retain high levels of efficiency during the summer. One study found that solar panels over crop land were **3% more effective** during the summer than traditional panels in the same region.



PV TRACKERS

PV panels typically perform best when they can face sunlight directly on. PV tracking systems were designed by engineers to help optimize the amount of sunlight that hits a PV panel by tracking the position of the sun relative to the module and moving the panel in tandem. These mounts are large and generally use 10-15% of the power they generate, but can **increase the overall amount of power** generated in an individual solar panel by up to 30%. **PV trackers** have not reached cost-effectiveness at scale yet.

Trend: New Solar Technology on the Horizon

Additional module advancements such as anti-solar panels and bifacial solar panels also have the potential increase the efficiency of solar power generation.



ANTI-SOLAR PANELS

Solar plants struggle to meet overnight demands for lack of a power source, forcing some grids to rely on non-renewable sources to shore up power generation. Anti-solar panels, which work by harvesting the heat that radiates from earth's surface at night, could help alleviate this problem by providing an extra reservoir of power for late-night surges. While still in the prototyping phase, research out of [UC Davis](#) and [Stanford](#) shows that the devices can increase solar farm energy production by 12%.



BIFACIAL SOLAR MODULES

Bifacial solar technology isn't a brand-new invention, but it has recently become more cost-effective and is now being considered for more utility-scale projects across the US. Research from the National Renewable Energy Laboratory (NREL) collected from June through November 2019 revealed up to a 9% gain in energy production using bifacial panels compared with traditional one-sided modules. The [NREL estimates](#) that shares of bifacial panels in the solar market will leap to 30% overall by 2025.



Solar Commissioning: Short & Long-Term Solutions.

As the solar industry rebounds from COVID-19 and looks to grow from 2021 - 2025, it will be important for facility owners to plan their commissioning timelines well in advance of their anticipated launch of operations.

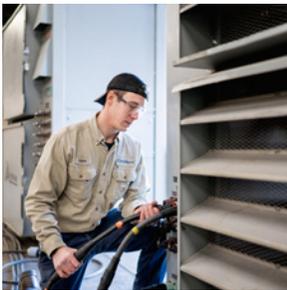
With a commissioning plan in place, facility owners can better meet critical deadlines, such as the Solar Investment Tax Credits set to expire in 2023. There's no better way to schedule the commissioning process according to your timeline than by utilizing a load bank solution to quickly test and validate your facility. Load bank testing ensures both grid-and microgrid-compatibility, as well as tests the safety and efficiency of your plant.

IEEE 1547.1-2020

On May 21, 2020 the [IEEE 1547.1-2020](#) standard was officially published, providing performance standards and DER requirements that will maintain distribution and transmission reliability long-term. Allowing for a grace period, this revised standard will become mandatory around October 2022, requiring adjustments to the solar commissioning process. While there is time to prepare your projects for the new testing standards, it is important to considering the ramifications of the IEEE 1547.1-2020 regulation when scoping projects that will take place after October 2022.

Benefits of Load Bank Testing Your Solar Farm

Load banks testing offers the flexibility and control to commission your solar farm to meet critical deadlines. Schedule efficient and accurate testing when it works best for you.



GENERATE REVENUE QUICKER

Waiting on availability for grid interconnections to commission your facility can cost you critical time and money. With a system of load banks and generators, you can meet deadlines, honor contractual obligations right away, avoid penalties from utilities and start generating revenue according to your own timeline. If your facility is commissioned and placed into service before December 31, 2023 you may also meet the qualifications for Solar Investment Tax Credit eligibility.



FULLY TEST YOUR SYSTEMS

Energizing your system to 100% of its rating provides a systematic way to confirm accurate performance levels and identify potential problems that could occur in the course of operations. Load bank testing is the quickest and most efficient method for fully and accurately energizing your system. With a system of load banks and generators, you can test how your facility will perform and make any adjustments necessary to reach maximum performance before your facility is commissioned.

ComRent: Load Bank Experts for Solar

When it comes to accurate and efficient testing, there's no better partner for the solar industry than ComRent. Load bank solutions from ComRent can deliver the variable, sustained loads required to meet the 600+ hours of testing mandated for solar farms. We also provide documentation that the required solar module tests were performed and the system met the requirements

outlined in IEEE 1547.1 interconnection test procedures.

We'll work with you to discover the unique testing requirements and timeline of your solar project and build a testing plan accordingly. With the most comprehensive suite of load bank solutions in the U.S., ComRent is the ideal partner for load testing your solar farm.



Ready to commission your solar facility?



Contact us today for a
complimentary consultation.



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