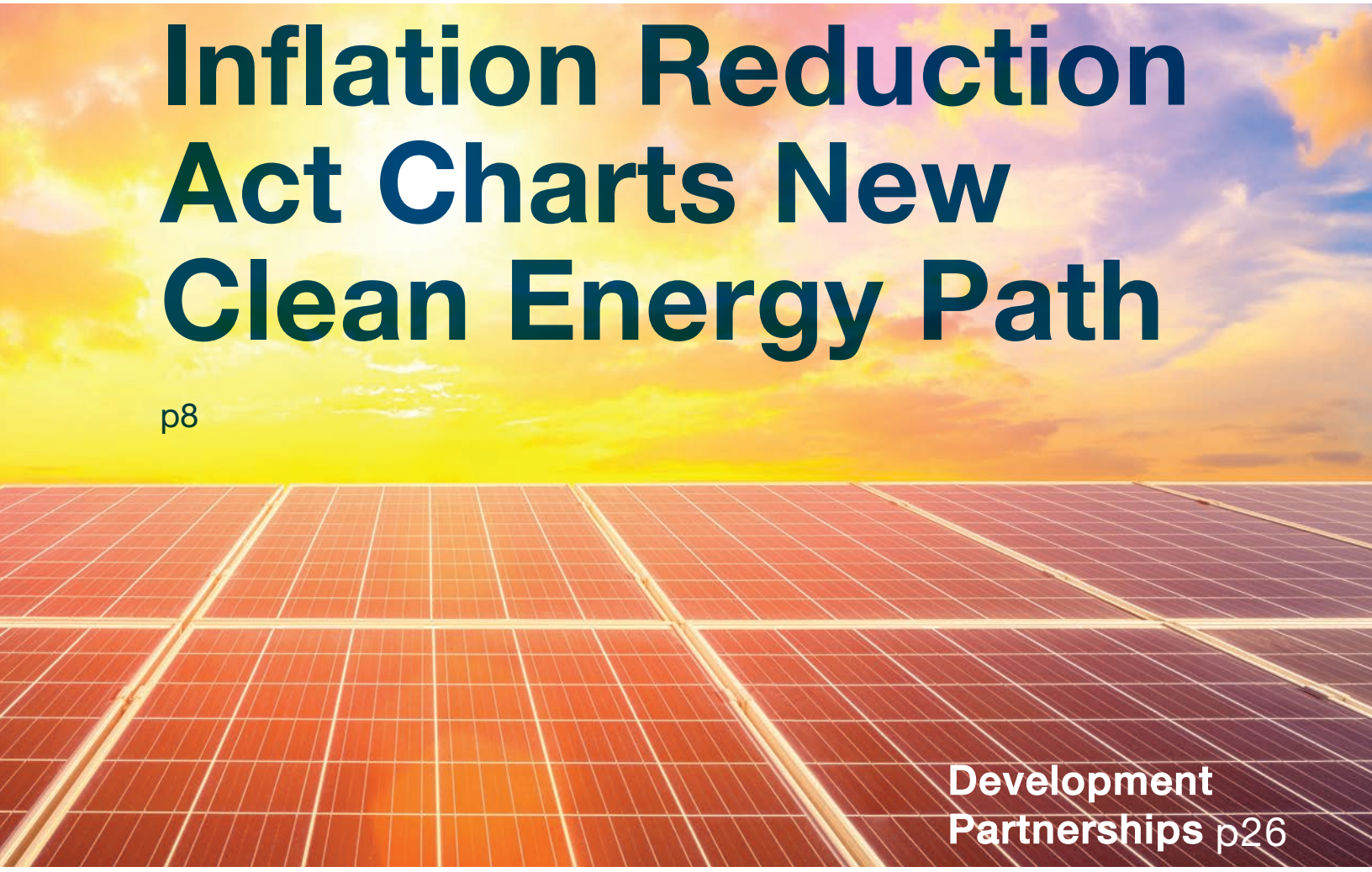
THE SOL SOURCE



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SOLSYSTEMS

WELCOME

THE SOL SOURCE is a journal that our team distributes to our network of clients and solar stakeholders. Our newsletter contains energy statistics from current real-life renewables projects, trends, and observations gained through interviews with our team, and it incorporates news from a variety of industry resources.

RENEWING
WHAT'S POSSIBLE

STATE MARKETS

California

Property tax exclusion likely extended to 2026

On August 23, 2022 SB 1340, a bill to extend the property tax exclusion for solar to 2026, went to the Governor. California has seen several reversals of long-planned energy policy decisions this year, including efforts to keep its last nuclear plant open while shelving (for now) plans to recalculate net-energy metering ("NEM"). The California Public Utilities Commission ("CPUC") recently issued a proposed decision that would delay a NEM 3.0 program to August 27, 2023.

On August 25, 2022, the California Air Resources Board will vote on regulation that will ban sales of new gas-powered cars by 2035. The measure is expected to pass.

Delaware & New Jersey

Third Circuit Court rules on Delaware and Hoboken climate lawsuits

On August 17, 2022, the Third Circuit Court agreed that lawsuits brought by the State of Delaware and the City of Hoboken, New Jersey, against oil companies belong in state courts. This is the latest in a series of cases fossil fuel companies have sought to hear in federal courts, which are presumed more hostile to states' efforts to hold major fossil emitters accountable for climate change. Four other appellate courts that have already rejected these efforts, but oil companies have asked the U.S. Supreme Court to rule on the issue.

District of Columbia

RPS increase legislation introduced

Before leaving for recess, Councilmember Cheh introduced the Local Solar Expansion Amendment Act of 2022, which would maintain the Solar Alternative Compliance Payment ("SACP") at $500/MWh and raise the solar carve-out from 10 percent to 15 percent by 2041 (DC already requires 100 percent renewables by 2032). The bill will be heard on October 3, 2022.

As a reminder, effective April 1, 2022, all new systems must have a revenue-grade production meter or inverter-based production measurement equipment. Older systems may continue to use estimation.

Mayor Bowser signed two pieces of legislation into law on August 1, 2022:

- The Clean Energy DC Building Code Act requires that all new buildings be net-zero by 2026 and energy produced onsite must be from renewable sources.
- The Climate Commitment Act requires that the District achieve carbon neutrality by 2045. To ensure that the target is met, the law sets five-year greenhouse gas targets. In addition, the law mandates fossil fuel-powered space or water heating appliances may not be installed in government buildings after January 1, 2025. Starting in 2026, the DC government may only purchase zero-emissions vehicles.

There remains no official word on nominees for the DC Public Service Commission vacancy.

STATE MARKETS

Illinois

Illlinois Power Agency submits final plan to the Illinois Commerce Commission

Illinois continues working to implement myriad regulatory requirements stemming from last year's landmark Clean Energy and Jobs Act ("CEJA"). After revising the Long-Term Renewable Resources Procurement Plan ("LTRRPP") based on stakeholder feedback, the Illinois Power Agency submitted its final plan to the Illinois Commerce Commission ("ICC") on March 21, 2022. The ICC issued its final order on the LTRRPP on July 14, 2022 which serves as a guidebook for CEJA's implementation and application. Shortly after, the IPA filed their compliance plan containing REC pricing for Block 6, which is set to open on September 1, 2022. Additional details on the LTRRPP, along with the full REC model and prices, can be found in this IPA announcement. The IPA is also expected to circulate an updated guidebook prior to the opening of Block 6.

The ICC also approved two additional procurement events to be held this fall and next summer for RECs from utility-scale wind, utility-scale solar, and brownfield site photovoltaic projects. The fall procurement is expected to be posted on October 7, 2022 with bids due by December 9, 2022.

Maine

Governor's Energy Office reconvenes DG stakeholder group

Maine continues to work to incent a wider variety of clean electricity options in the state while wrestling with their role in the national transmission system. The Governor's Energy Office has reconvened the distributed generation stakeholder group now that Maine's legislative session has ended. We expect a straw proposal later this fall to contain more successor program design details in advance of a final report due January 2023. Litigation continues over the fate of the New England Clean Energy Connect (NECEC) transmission project, which was the subject of a ballot measure approved by state voters in November. The NECEC project would carry electricity from Canadian hydropower to the New England grid.

STATE MARKETS

Massachusetts

Omnibus climate legislation signed into law

The Baker Administration continues to push forward several energy-related items in its last year. On April 15, 2022, the Massachusetts Department of Environmental Protection ("MassDEP") published proposed amendments to the Clean Energy Standard ("CES"). The proposed amendments include setting the CES alternative compliance payment ("ACP") and Clean Energy Standard-Existing ("CES-E") ACP to $35/MWh and $10/MWh respectively for years 2022 through 2050. Comments were due on June 3, 2022, and we expect a final decision in the coming months.

On August 11, 2022, Governor Baker signed omnibus energy legislation into law (HB 5060). Among other things, the law maintains an offshore wind procurement target of 5,600 MW by 2027 and creates an offshore wind tax credit. The law also addresses grid modernization and directs the Massachusetts Department of Energy Resources ("DOER") to study a variety of energy storage programs. Furthermore, it requires that DOER include a pollinator-friendly solar incentive in the Solar Massachusetts Renewable Target ("SMART") program or successor program, bans biomass from qualifying for the RPS after January 1, 2022, as an eligible RPS Class I or II technology, and mandates that all new vehicle sales in the state be zero-emission beginning in 2035.

New Jersey

Senator Smith introduces RPS revision bill

The Board of Public Utilities continues to broadly deny extensions for projects unlikely to meet Transition Renewable Energy Credit ("TREC") deadlines while smoothing the process of moving projects from the TREC to the Administratively Determined Incentive ("ADI") successor program. On April 26, 2022, BPU issued a Straw Proposal for the Competitive Solar Incentive ("CSI"). While there have been delays, the CSI program is expected to launch later this year. The BPU is also expected to review ADI incentive levels as part of the one-year review. Legislation related to interconnection (S431), energy storage incentives (S2185), remote net metering (S2848), and the legacy SREC program (S439) moved through the Senate and are expected to be heard in the Assembly this fall.

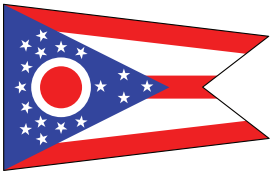
Senator Smith (D-17) recently introduced S2978, which would revise the RPS in New Jersey. Specifically, the bill would apply the Class I standard to electricity sold in the State after subtracting electricity generated by existing nuclear and other zero-carbon sources. In addition, the bill would also require that at least 50 percent of RECs used to comply with the RPS be located in New Jersey. Finally, it would mandate that 100 percent of retail electricity delivered to New Jersey be from Class I sources by 2045 and would remove the Class II requirement in 2045. The bill has been referred to Senate Environment and Energy Committee, where we expect a hearing this fall.

STATE MARKETS

New York

New York Power Authority opposes Assembly's Build Public Renewables Act

On July 28, 2022, the New York Power Authority ("NYPA") announced that they did not support the Build Public Renewables Act that passed through the Senate (S6453) on June 1, 2022. The Assembly companion bill (A1466) did not move forward prior to the end of session. The bill would have directed NYPA to build and own new renewables and require the Authority to largely shut down fossil fuel plants by 2030. New York State has a goal to reach 70 percent renewable electricity by 2030.



Ohio

Public Siting Board proposes procedure revisions

On June 16, 2022, the Ohio Public Siting Board **proposed procedure revisions, including one that would require solar setbacks** of 150 feet from roads and unaffiliated properties and 300 feet from unaffiliated residences. Other proposals include public disclosure requirements for new facilities, codifying decommissioning requirements included in SB 52, and fencing requirements for solar sites. Comments were due August 12, 2022.

Pennsylvania

Court-issued injunction delays Pennsylvania participation in RGGI

After several showdowns between Governor Wolf (D) and the Republican-controlled Legislature, including a last-minute stay on publication, regulations establishing Pennsylvania's participation in the **Regional Greenhouse Gas Initiative** ("RGGI") were published April 23, 2022. However, on July 8, 2022, the Commonwealth Court issued an injunction, further delaying Pennsylvania's participation. The injunction required plaintiffs to post a $100 million bond, subject to forfeit if they lose the underlying challenge to RGGI.

STATE MARKETS

Virginia

Stakeholder panel makes recommendations on HB206

A Stakeholder Consultation Regulatory Advisory Panel (RAP) was recently convened to make recommendations to the Virginia Department of Environmental Quality ("DEQ") and the legislature regarding implementation of HB206, which modifies the Permit By Rule process for solar projects under 150 MW. Topics covered across the five RAP working groups include avoidance & mitigation, mitigation/in lieu, significant adverse impact for projects less than 10 acres, and local control.

In March 2022, DEQ announced that it would define solar panels as impervious surface areas. On April 14, 2022, DEQ released additional guidance that pushed implementation out to January 1, 2025, for all projects that have not received interconnection approval. In July, DEQ released two additional stormwater guidance documents focused on stormwater management and erosion and sediment control. Comments are due August 31, 2022.

The 2022 Virginia Energy Plan process has officially kicked off (as directed by the Virginia General Assembly, every four years the Virginia Department of Energy develops a comprehensive Virginia Energy Plan). The 2022 Energy Plan will provide energy policy recommendations around environmental goals, energy costs, consumer choice, and innovation.

On April 14, 2022, the Virginia State Corporation Commission ("SCC") opened a docket to establish a self-certification process for small distributed generation systems seeking to qualify as low-income projects and consider additional GATS-related questions. On July 26, 2022, the SCC issued an order for additional comments in the docket. Staff are required to file comments by September 22, 2022. All other stakeholders may submit comments until October 20, 2022. One issue the industry has raised is the September 2021 Order requiring revenue-grade meters for all projects regardless of size or interconnection date.

Inflation Reduction Act Charts New Clean Energy Path

By Kathleen Robertson, Brandon Schneider, and Andrew Williams

A new generation of clean energy begins in the United States. As the Inflation Reduction Act of 2022 (IRA) becomes law, we embark on new and historic opportunities for developers, investors, and renewable energy buyers. Numerous analyses demonstrate the clean energy and climate provisions of the IRA will spur economy-wide greenhouse gas emission reductions of 40 percent while beginning to reshore critical manufacturing supply chains. This will allow corporate leaders to accelerate clean energy investments and to make more impactful energy procurement decisions as the IRA begins the process of addressing historical energy inequities in communities across America.

Additionally, the IRA will spur new technological growth, which will lead to new clean energy resources and increased project availability for energy buyers across the US. Energy Innovation also found that the IRA could create up to 1.5 million jobs by 2030. Underpinning the success of the IRA is the need to scale the renewable energy sector. Wood Mackenzie estimates that, at a minimum, the IRA will lead to 67 percent more solar.

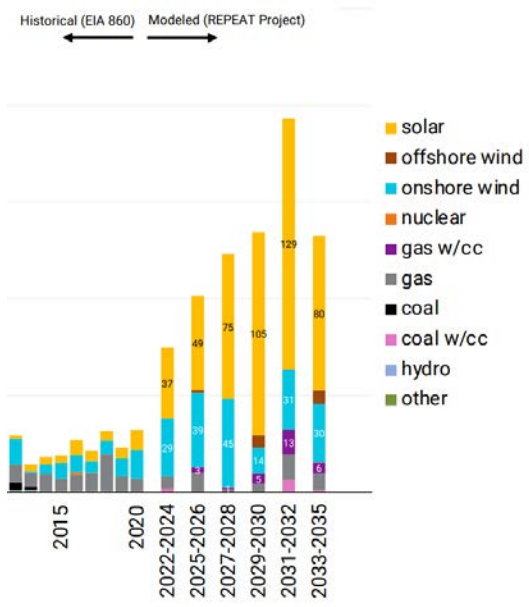
What's in a Name?

In our last CEO letter, we highlighted the threat that inflation poses to the renewable energy industry while noting the deflationary potential of clean energy. The aptly named Inflation Reduction Act's monumental investments in clean energy should have a long-term deflationary impact.

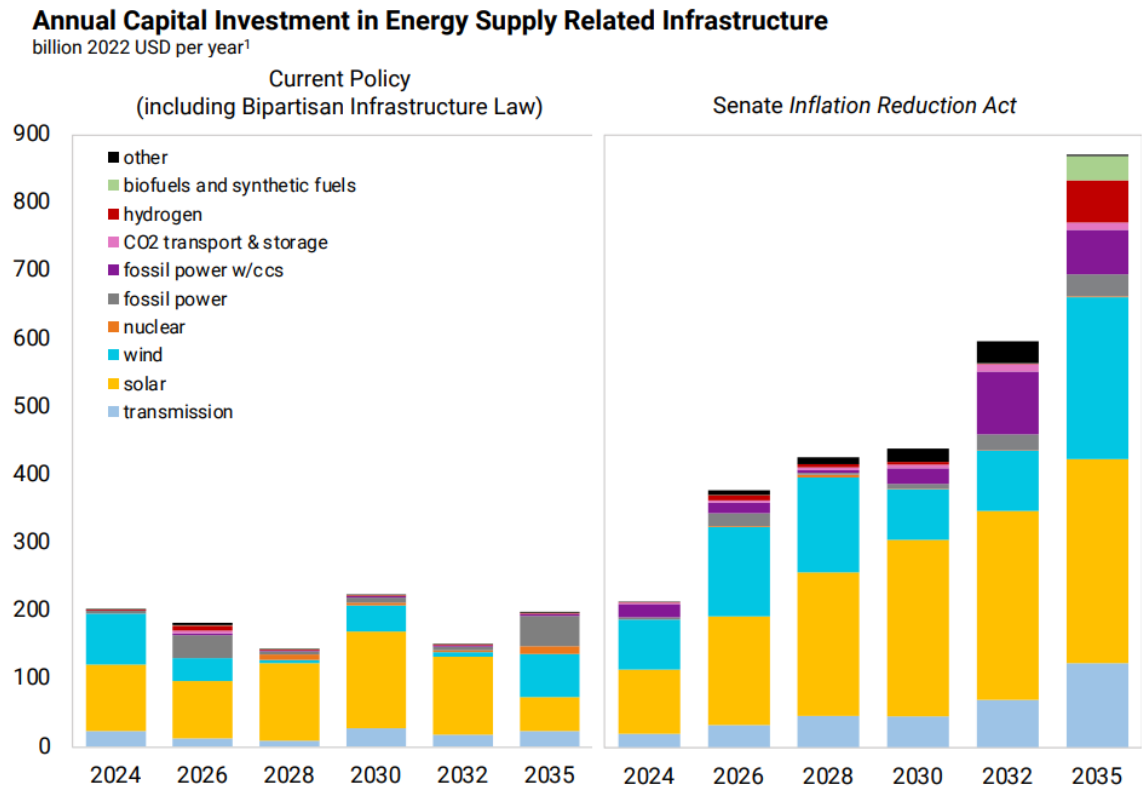
Expected Impacts on Project Finance and Tax Equity

Wood Mackenzie projects the IRA solar incentives will result in 67 percent more solar additions between 2022 and 2032. The Princeton REPEAT Project estimates this will drive over $4.1 trillion in cumulative capital investment over the next decade, as shown below.

Historical capacity additions and protections under the Act (GW)



Annual Capital Investment in Energy Supply Related Infrastructure



Although we expect that the IRA's new direct-pay and transferability options (detailed on pg. 12) will allow new participants without tax obligations, such as electric cooperatives and municipal utilities, to construct renewables, we do not expect the new options to slow appetite for traditional structured tax equity transactions. To begin with, we expect guidance and initial demonstration of the new options to take at least a year, advantaging traditional tax equity investments in the near term. But even over the longer term, we expect structured tax equity financing will remain more attractive to corporate partners because of its lower recapture risk, its ability to monetize depreciation, and the opportunity it provides for projects to be valued at fair market value rather than cost. The chart on the following page provides a high-level overview of the advantages and disadvantages of transferability versus structuring from a sponsor's perspective.

Pros and Cons of Transferability	
Pros	**Cons**
Efficiency: Developers can immediately monetize the ITC or PTC without engaging in time and cost-intensive structuring.	**FMV & Step-up Loss**: As there is not an asset sale or related-party asset transfer that occurs, sponsors would likely be unable to step up the value of the asset to fair market value (FMV) and thus unable to raise sufficient tax equity capital to make thin projects economically viable.
Wider Market Demand: Tax investors who previously steered clear due to the complexities of tax equity deal structuring (or had no tax obligation to offset) will likely be more willing to execute a simple and streamlined purchase agreement.	**Depreciation Loss**: Most developers, except for the large vertically integrated players, will not be able to monetize depreciation without structuring conventional tax equity partnerships and so would sacrifice tax benefits that would otherwise have been allocated and paid for via a conventional tax equity partnership
	Indemnity and Recapture: Direct purchase of ITC by a tax equity investor will rely on sponsor's balance sheet and credit worthiness. This transfer would occur without the protections provided through direct equity ownership in the project's owner entity. In the case of a recapture event, or ITC doesn't qualify for the anticipated percentage, tax equity investor would have to pursue the sponsor for damages.
	Pricing: Sponsor will likely have to sell the ITC at a discount as tax equity investors are not going to pay $1.00 for $1.00 of tax credit. Transfers of non-energy tax credits indicate a maximum value of 85¢ to 90¢ per $1 of credit.

Beyond the changes in methodology for investors to acquire tax credits, the IRA allows solar projects to elect Production Tax Credits (PTC) instead. This opens the possibility of structuring a PTC investment similar to the PAYGO financing tax equity structure that exists in the wind segment of the market today. Within the solar space, this could provide additional benefit in geographies with high yields and where production is highly predictable.

Implications for Developers

We expect a limited positive impact on current projects given that the 2022 ITC rate has now increased to 30 percent from the expected 26 percent without triggering labor requirements. We expect this 30 percent to extend into 2023 and for 60 days after the IRS issues new guidance, giving near-term projects an unexpected boost.

In addition, the new adders available for projects in fossil fuel transition communities "energy communities" and for projects incorporating domestic content will drive needed investment in both. The IRA seeks to drive clean investment in "energy communities, which may be thought of as energy transition communities – communities that have borne the brunt of fossil fuel usage and should not be

left behind in the shift to clean energy. Per the IRA, energy communities include:

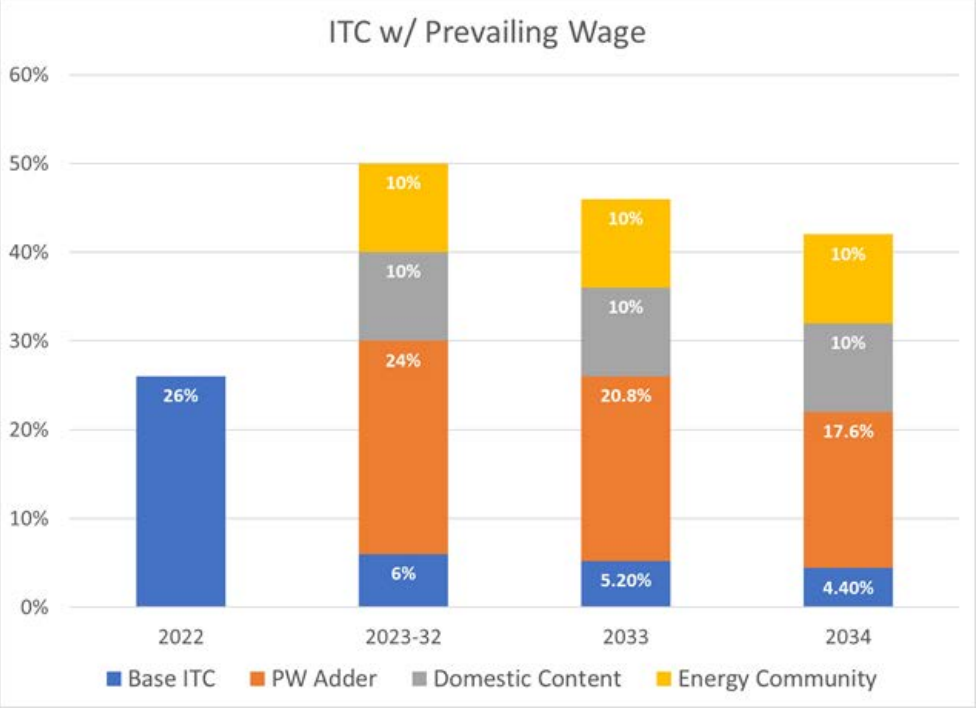
- Brownfield Sites
- Areas with high historical fossil fuel employment and currently high unemployment, and
- Areas where coal mines and/or coal-fired power plants have closed.

Thus, a strong financial incentive for projects in energy communities will allow them to continue powering America, but with new access to clean energy resources and funding. In addition to the clean energy and climate benefits, the IRA's investment in energy communities will have untold public health benefits for communities that have been disproportionately impacted for too long.

Clean Energy Tax Credits

Among other credits, the clean energy tax credits in the IRA maintain the historic standalone solar ITC until 2025 when the credit shifts to technology-neutral. Essentially, after 2025 the IRA tax credits incentivize any method of generating electricity without emitting carbon dioxide (CO2). This includes stand-alone energy storage, clean hydrogen, and advanced and existing nuclear, as well as domestic manufacturing. Additionally, credit recipients, including solar, now have the option to select either the investment tax credit (ITC) or production tax credit (PTC). We anticipate that most solar operators will continue to prefer the ITC, at least in the initial years. The below illustrates the base ITC and adders available to larger solar projects meeting labor requirements (additional incentives are available for smaller projects, including the ability to consider

ITC with Prevailing Wage



interconnection costs in calculating total project cost eligible for the ITC). These credits will begin to phase out the later of 2032 or when the electric power sector emits 75 percent less CO2 than 2022 levels. This will for the first time directly connect clean energy credits to decarbonization goal, and ensure they are available to achieve it.

Important to note that the IRA sets the base ITC at six percent if new labor conditions are not met, but allows for a step-up to 30 percent if labor conditions are met (the PTC is similarly structured). In order to receive the full ITC (or PTC), prevailing-wage labor requirements must be met for all projects over one megawatt (MW). This includes:

- Payment of prevailing wages during construction, as well as for labor on repairs or alterations during the five-year recapture period on the ITC (for projects over one MW).
- Use of sufficient apprenticeship ratios, unless demonstrably unavailable.
- Additive ITC bonuses would be available for sufficient use of domestic content as well as construction in an energy community. At 10 percent each, a 50 percent ITC is possible for projects that meet both additional criteria. For smaller projects, an additional 10–20 percent is available for solar projects located in certain low-income communities, low-income residential buildings, or on tribal land.
- Transmission upgrades would be considered qualifying property for the calculation of the ITC when part of a project under five MW.

Additionally, for the first time the IRA extends "direct pay" of tax credits to non-profit entities for all resource types and for a limited time to all entities for new categories, such as carbon capture and storage (CCS). Direct pay means that qualifying entities may elect to receive adirect payment of the value of the credit, eliminating the need for participation by an investor with a sufficient tax obligation to monetize them. Entities not eligible for direct pay, including for-profit businesses, are allowed a one-time transfer of each year's eligible credits to an unrelated taxpayer. We will continue to assess the pros and cons of the new transferability provisions as compared to traditional tax equity financing. Transferability will be effective in early 2023, although forthcoming IRS guidance is necessary to answer questions about how it will work.

Broad Tax Changes that Affect Solar Financing

Several general tax provisions have implications for clean energy financing, most notably the new rules regarding calculation of corporate taxes. For taxable years beginning after 2022, the IRA will apply an alternative minimum tax to C-corporations that have an average annual adjusted financial statement income (i.e., "book" income) for any three-year period in excess of $1 billion. The IRA does not change existing depreciation schedules, but bonus depreciation benefits are slated to phase out between 2023 and 2026, which may have longer term impacts on project finance, as discussed further below.

What's Next?

What is clearer now than ever before is that clean energy will drive domestic climate action and provide new opportunities for renewable energy growth, procurement, and investment. President Biden signed the IRA on August 16, 2022, and now it heads to the Internal Revenue Service (IRS) for implementation and guidance. While the IRA provides a domestic path to begin building a better tomorrow, it is now on the shoulders of the renewable energy community to execute on the tasks ahead of us and to ensure the future we create is one that benefits all.

Assessing Current and Emerging Technologies in Solar Energy

By Will Patterson and Sarah Mosley

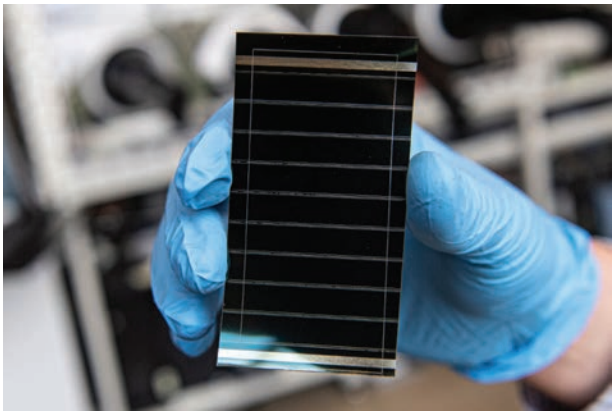
New technology and scale continue to drive advancements in renewable energy. This is an exciting time for solar technology, particularly as implementation of the Inflation Reduction Act (IRA) begins. Here, we highlight some of the market and current and some future technological trends in solar energy.

High Material Cost is Causing Strategy Adjustments for Developers

In June of 2020, previously record-low spot market prices for polysilicon began to rise - a trend we expect to continue into 2023. With it, the cost to build solar energy began to increase for the first time in a decade, and unexpectedly high procurement costs have left developers looking to reduce supply-chain and logistics cost, in part, by maximizing system capacity and size. As a result, the physical size of solar modules, along with the inverters, cables, and transformers necessary to facilitate them is increasing. Before we delve into the details, it's important to understand the basic facts underlying new module technologies.

Mono-PERC Dominant as Bifacial Market Share Increases

In 2018, we wrote about how premium, higher-efficiency cell technologies, like monocrystalline PERC (mono-PERC) modules, were beginning to close the price gap with non-premium modules. The price gap is now non-existent, and mono-PERC cells dominated the market with a market share of 85 percent in 2021 (and likely much higher when considering only the U.S. market). Mono-PERC cells have impressive energy conversion efficiency that currently averages approximately 21 percent, and their consolidated market share has helped



reduce cost at scale. In addition, roughly half of 2021 solar installations incorporated the use of bifacial modules, which only further increases efficiency of projects. Before 2020, bifacial modules only made-up approximately 15 percent of the overall module market, but is now expected to exceed 85 percent by 2032 (this should continue or even increase with continued exemption of bifacial modules from Section 201 tariffs. In brief, today's utility-scale solar projects are now overwhelmingly using bifacial mono-PERC cell technology, considered a premium just a few years ago.

Decreasing Levelized Cost of Energy (LCOE) in the Face of Rising Build Costs

Increased module sizing has been key to bringing down the levelized cost of energy (LCOE) for solar, particularly in the utility-scale sector. In the second quarter of 2022, modules with 182 to 210 millimeters (mm sized cells accounted for 80 percent of module shipments, The increase is notable when compared to 2018, when the previous standard 156.75 mm cells dominated the market with an approximate 90 percent market share. Larger Developers that were installing 400 to 450 watt (W) modules in recent years are now routinely installing 600W or larger modules, and the modules with 210 mm cells alone are expected to reach 56 percent market share by 2023.

The implementation of larger-format modules results in changes to the equipment, cost, and overall layout of a site. The use of larger modules typically results in the need to upscale other equipment, such as racking systems. This can lead to an overall reduction in LCOE of the project, as developers are able build larger capacity systems using larger components that require less labor, transportation, and operations and maintenance (O&M) costs. As module sizes increase, however, installation will eventually become more difficult and single-axis trackers will require thicker foundations and torque tubes to maintain structural stability under increased wind loading. Thus, over the longer term we expect a plateau to size increase and a continued focus on efficiency improvements. In the meantime, larger-format modules are helping utility-scale projects pencil in the wake of an unusually expensive market.

What does Tomorrow's Solar Look Like?

While we can expect the continued adoption of larger format bifacial modules in the near term, emerging technologies continue to seek market share in the coming years. Two versatile technologies peak our interest: perovskite-based solar cells and luminescent solar concentrators.

Perovskite solar cells are an emerging thin-film cell technology built using the calcium titanic oxide mineral perovskite rather than silicon. Following years of fast improvement, researchers recently achieved efficiencies greater than 30 percent in lab environments by combining perovskite with silicon in what are called tandem cells. This flexible, lightweight, and high-efficiency technology offers appealing potential in a variety of applications ranging from buildings to vehicles. While lab results are promising, the technology faces many barriers to commercial viability. Perovskite-based cells have long suffered a high rate of degradation, and solving the technology's durability issues will be key to its prospects of competing with current technologies that continue to extend project lifetimes. While the technology has the potential to be relatively low cost, it has yet to pave a clear path to a commercially viable product that can be manufactured at scale.

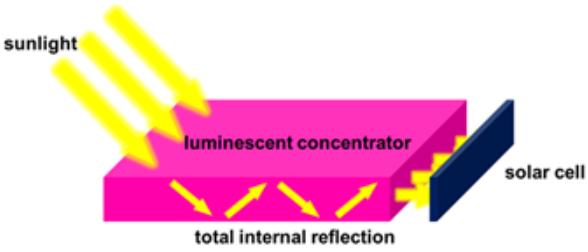
While perovskite technology is an example of a new, highly efficient solar cell that is achieving impressive results in ideal lab conditions, technologies like luminescent solar concentrators (LCSs), which use existing cell technology present an interesting near-term opportunity. In a lab testing environment, LCSs achieves ideal results by concentrating the highest magnitude of irradiance directly perpendicular to the cell. In other words, direct sunlight which is far from field conditions. LSCs, however, can efficiently convert irradiance in the field regardless of magnitude or angle of incidence through solar concentration.

LSCs look like a translucent, usually colorful, piece of plastic that glows slightly around the edges. Whereas solar modules absorb light directly into the cell at the angle the sunlight hits it, LSCs absorb incoming radiation into the material, trapping it there through a phenomenon known as total internal reflection. This trapped irradiance is then concentrated directly in solar cells at the edge of the material, giving it the ability to harness diffuse irradiance similar to lab conditions.

Because of its ability to efficiently convert diffuse irradiance into electricity, as well as its largely transparent material, LSCs are becoming a more practical and less expensive way to integrate solar cells into applications like windows. This could allow solar generation using a building's façade rather than just its roof. Additionally, recent breakthroughs in "quantum dot solar concentrators," provide a longer life and a wider variety of colors for LSCs, which could lead to a clearer path for future commercial viability.

Scaling the solar industry at a rate necessary to succeed under the Inflation Reduction Act (IRA) will require increasingly innovative solar design and deployment. We look forward to keeping you updated as technology continues to evolve.

A diagram illustrating how luminescent solar concentrators work – Credit: 4TU



A quantum dot LSC window – Credit: NREL

Spotlight – **GRID Alternatives Mid-Atlantic**

By Adaora Ifebigh

In the June edition of the Sol SOURCE, we introduced our Infrastructure + Impact Spotlight Series - an opportunity for our staff, partners, and customers to get to know the community-based organizations we work with, other notable organizations that are doing their part to ensure a just and sustainable future, and to learn more about Sol's role in facilitating the journey towards a more just energy future.

This quarter we highlight our partnership with GRID Alternatives Mid-Atlantic (GRID), a non-profit based in Washington D.C. that provides no-cost solar installations and solar job training. GRID Alternatives is a community partner in our partnership with Microsoft to combine a 500-megawatt (MW) framework power purchase agreement (PPA), one of the country's largest, with a groundbreaking strategy to invest in under-resourced communities and communities disproportionately impacted by climate change.

GRID's mission is building community-powered solutions to advance economic and environmental justice through renewable energy. Through their Solar Works DC[1] and Solar Futures programs, GRID provides hands-on, group-based installation training and soft skills development for DC residents. This workforce development program is crucial in making the solar industry more inclusive for people of color. Additionally, GRID works extensively with low- to moderate-income residents in DC—including Wards 7 and 8, historically marginalized areas in DC where access to affordable, healthy food is limited

or non-existent. In these food deserts, areas where it is difficult to buy affordable or good quality fresh food, resources are scarce and environmental issues are more severe. GRID helps democratize renewable solar energy to make affordable electricity, cleaner air, and sustainable career development available to everyone.

GRID is led by Executive Director Elijah Perry, a charming and passionate DC resident whose family has called the District home for decades. Elijah believes firmly in the principle that even marginal changes have impact on intractable problems. This adage is also becoming clearer to me as I work in community impact and through collaborations with people like Elijah—we do not need to wait to be able to move mountains to solve problems. Our work could start small and lead to a ripple effect in the community. GRID's work in the Washington DC community, led by Elijah, is a pebble breaking the surface of the pond.

There is no better example of the immense impact of GRID's work in the community than Jahlil Wormley, a graduate of the Solar Works DC program. When Jahlil graduated high school, he was unsure about what career options he could pursue. In the few months following his graduation, he experienced homelessness and gun violence. The violent

[1] *Solar Works DC is part of the Department of Energy and Environment's Solar for All program, which seeks to provide the benefits of solar electricity to 100,000 low-income households and reduce their energy bills by 50% by 2032.*

experiences threatened his life and his ability to walk again. Two years later, Jahlil is not only walking well, but he also lives in his own apartment and earns $20 per hour in his first full-time job at Tesla Energy in Prince George's County, MD. He credits GRID's Solar Works DC program for helping him get his life on track. Not only did Jahlil attend the hands-on solar installation training, but he also used the career development and wrap-around support services provided by the program. Solar Works DC trains people on how to install solar panels and provides support through resume building, financial literacy, mock interviews, and addressing needs related to mental health, hunger and other issues that can affect personal growth.[2]

Since the fall of 2021, over 40 participants have graduated from GRID's workforce training programs. Out of these graduates, 19 of them have received offers for solar jobs in the Washington DC metropolitan area. One local partner hired four trainees from the class, the most hires made by a single organization. This employment opportunity includes a trip abroad to work on solar installation projects in Kenya. According to Elijah, the intangible benefits from an opportunity to travel internationally are immeasurable especially for people who never left the locality where they were born and raised. Not only does GRID help its trainees to secure employment with its partners, GRID also frequently hires trainees as instructors for new classes. To continue playing a role in addressing the gender disparities that exist in the solar industry, GRID has hired three women from the recent class as full-time solar instructors.

A financial contribution from Sol Systems (Sol) enhanced GRID's ability to provide financial and computer literacy components to the installer training curriculum, career support activities, build community partnerships, and engage more employers to support greater inclusion in the solar sector.

Sol's commitment to under-resourced communities is a priority shared by the leadership and staff. On April 13, 2022, staff at Sol participated in an Employer Day hosted by GRID for Solar Works DC trainees. During that session, Sol staff shared their various pathways to a career in the solar industry, offered instruction on job search, interviewing and soft skills needed to succeed in the workplace, tips on the benefits of mentorship, etc. The benefits of learning from employees in an organization in the industry where a person hopes to gain a foothold are innumerable especially in the face of barriers to advancement. On April 23, 2022, GRID Alternatives joined Sol Systems to celebrate Earth Day at a Starbucks Community Store event in Landover Hills, Maryland. Partnering with organizations like GRID shows how meaningful engagement with communities to tackle local challenges and build a sustainable pathway for future generations can be accomplished when the mission is shared by leadership, staff, and the community.

[2] *To read more about Jahlil Wormley's story, visit GRID's website at: For Jahlil, Solar Works DC Provided More Than Just Solar Training | GRID Alternatives*

GETting from Here to There: Grid-Enhancing Technologies Mature

By Chris Accou

One notable challenge of the American energy transition lies in modernizing the transmission grid at a pace that reliably integrates the enormous growth of clean and renewable energy. With federal clean energy investments like the recently-signed Inflation Reduction Act (IRA) incentivizing the development of wind and solar power projects faster than the grid can expand, new grid-enhancing technologies (GETs) can offer a bridge between the speed of generation built and the ability of the grid to catch up. Simply put, in the decade that it takes to build new transmission lines, GETs can be deployed in a matter of months and alleviate grid congestion keeping renewables in the queue. One such technology, dynamic line ratings (DLRs), has the potential to ease congestion on transmission lines and enhance safety and reliability by improving the accuracy and transparency of line ratings. Not only would these improvements provide much-needed consumer savings, but they would reduce the cost and increase the speed of interconnecting more solar and wind power resources as well.

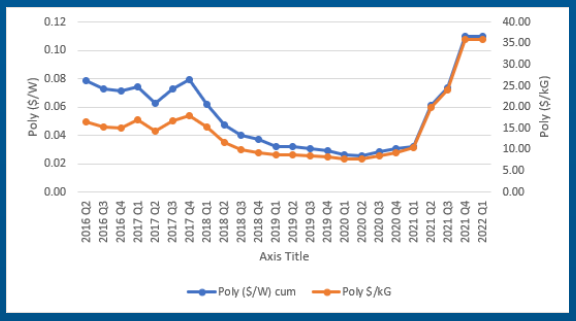
For decades, many North American transmission operators have used static line ratings (SLRs) to determine the maximum power flow capacity on a transmission line. Appropriate for the mid-20th century grid, SLR calculations use intrinsically conservative assumptions regarding atmospheric operating conditions to produce transmission constraints that vastly underestimate how much power lines can carry. Using modern computing power and digital monitoring, DLR systems, by contrast, paint a more accurate picture of transmission line capacity by accounting for the role of real-world conditions such as rain, air temperature, cloud cover, and wind speed. This ambient approach to grid management can both reveal significantly greater transmission capacity than previously presumed while also detecting situations where flows should be reduced for safe and reliable operation.

As the demand for clean electricity continues to grow, misaligned regulatory and economic incentives have caused transmission gridlocks with multibillion-dollar congestion costs while also preventing the interconnection of over 70 percent of the new renewables and nuclear capacity needed to hit climate targets set by the Biden Administration and a growing number of states. On February 17, 2022, the Federal Energy Regulatory Commission (FERC) launched an inquiry aimed at evaluating the benefits, costs, and challenges of DLR implementation. Furthermore, several utilities like New England's National Grid and New York's Power Authority have begun piloting DLR systems on transmission lines across their service territories. The recently passed Inflation Reduction Act, with its long-term solar and storage tax incentives, serves as further evidence of the tide turning toward a future beyond wires that includes a broader range of transmission technologies. No one is touting GETs as the panacea to the climate crisis nor is their optimal deployment as simple as dropping DLR systems on every transmission line. Not up for debate, however, is that grid capacity must expand in coming years to integrate an ever-evolving resource mix efficiently and reliably. To that end, grid-enhancing technologies present a viable alternative capable of spurring the cost-effective transmission infrastructure that will help decarbonize the electric grid with significant clean energy deployment.

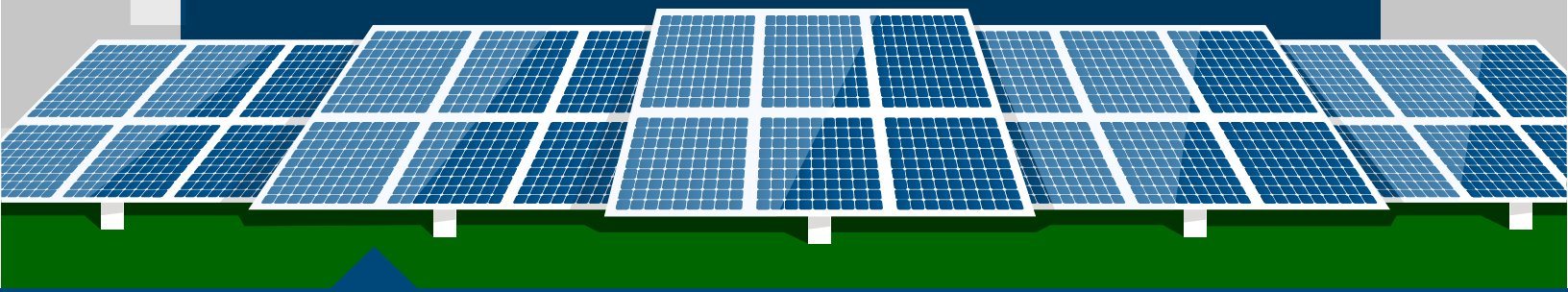
Rising Polysilicon Prices, & U.S. Supply & Demand Volatility

While a variety of factors have impacted the state of the U.S. solar market, the main driver in increased global cost of modules is the rising price of polysilicon. Over the 4 quarters in 2021, the price of polysilicon rose to roughly $37 per kilogram (kg) from $10/kg. The rise stems from a global supply shortage that was a result of ultra-competitive Chinese polysilicon that pushed many non-Chinese suppliers out of the market over a two to three year period. As a result, many non-Chinese suppliers left the market with a variety of factors preventing reentry, including the high capital expenses of production ($1.5 billion per 100 kiloton plant) and long development, construction, and commissioning timeframes for facilities. This decreased supply capacity combined with continued robust demand growth left the market increasingly undersupplied – and, therefore, increasingly expensive.

Compounded with global polysilicon price hikes were multiple U.S policy developments that further tightened the market for American developers. First and foremost, U.S. efforts to prevent the import of products produced with forced labor in the Xinjiang region of China affected the



the availability of polysilicon and modules. The U.S Customs and Border Protections (CBP) issued Withhold Release Orders (WROs) on Xinjiang-linked products in the third quarter of 2021, resulting in five gigawatts (GW) of polysilicon supply being detained or unavailable for purchase. The subsequent Uyghur Forced Labor Prevention Act (UFLPA) federal law banned imported goods produced by forced labor in China's Xinjiang region (all goods produced in Xinjiang are presumed to be produced with forced labor) was implemented in June 2022. This is projected to result in another 10 GW of supply being detained or unavailable for purchase.

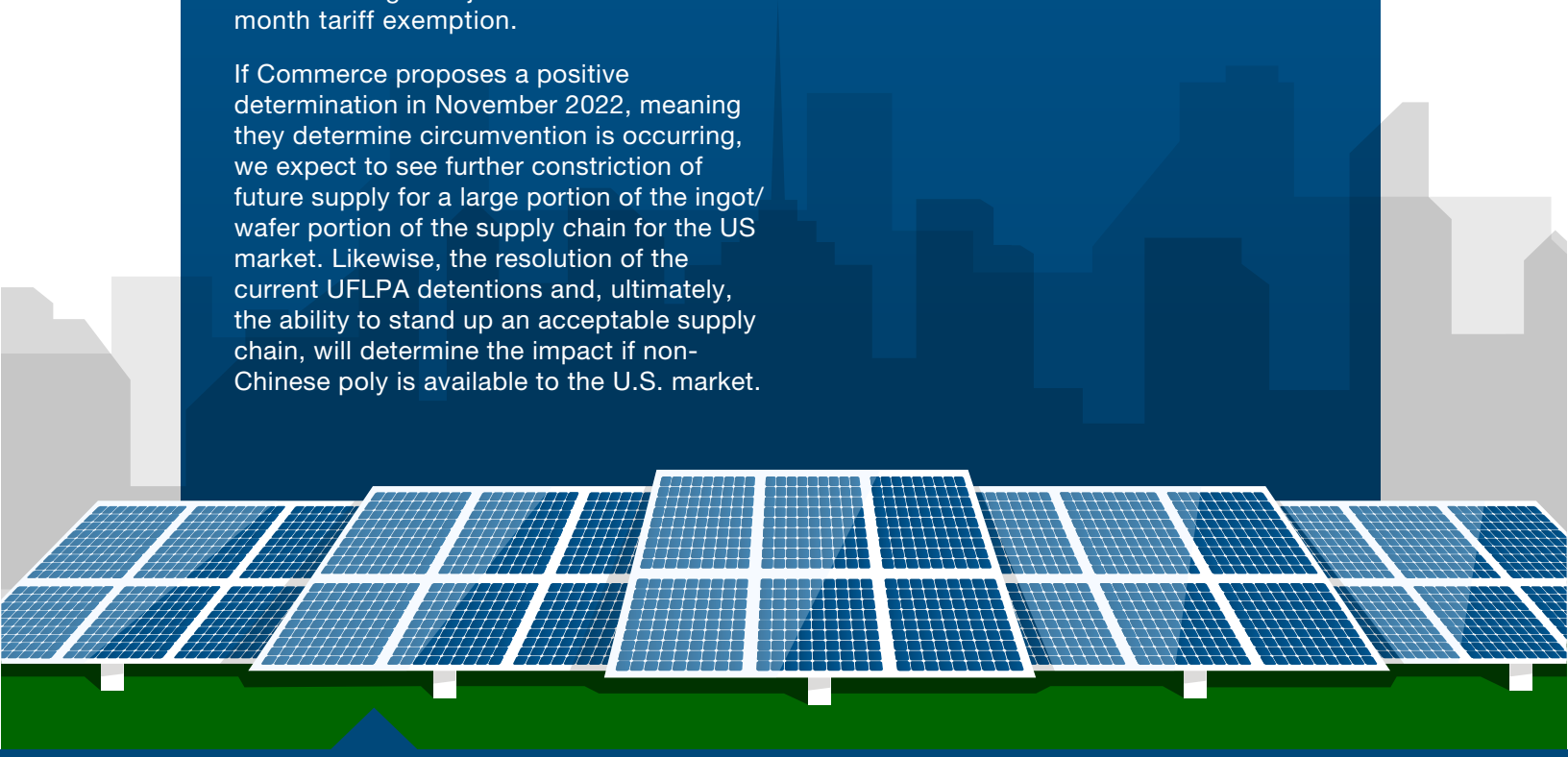


MODULE MARKET UPDATE

Layered on the polysilicon supply and demand driven price increase, Auxin Solar filed and Commerce initiated an AD/CVD circumvention investigation in April of 2022, which threatened heavy tariffs on crystalline silicon (cSi) imports into the US from Malaysia, Thailand, Vietnam, and Cambodia (80% of the US market at the time). With the Commerce looming preliminary determination on the (then retroactive) tariff in (then) August 2022, U.S. module supply came to an immediate halt. Neither buyers nor Sellers could accept that material retroactive tariff risk, leading to 8 GW of demand pulled from the market. In June 2022, the Biden Administration issued a 24-month tariff exemption, restoring supply capacity in the U.S. market, with prior demand now stacked to the right. We note that industry opponents of the Biden Executive Order will likely sue the government, perhaps even claiming an injunction on the 24-month tariff exemption.

If Commerce proposes a positive determination in November 2022, meaning they determine circumvention is occurring, we expect to see further constriction of future supply for a large portion of the ingot/wafer portion of the supply chain for the US market. Likewise, the resolution of the current UFLPA detentions and, ultimately, the ability to stand up an acceptable supply chain, will determine the impact if non-Chinese poly is available to the U.S. market.

During the last two years, the rise in polysilicon prices has resulted in polysilicon taking a much larger portion of the capital stack for solar projects, now comprising 40 percent of total the module costs. This has been the main driver of US market modules costs increasing from $0.26 ($/W) in fourth quarter 2020 to $0.44 in third quarter 2022. Global polysilicon capacity is surging to accommodate and take advantage of high pricing and demand, and some studies believe that poly pricing will begin to drop again in early 2023. However, the US may not be able to enjoy in that additional global supply and price easing if it cannot effectively accommodate Chinese poly due to the UFLPA. For more on the technology implications brought about by the rising cost of polysilicon, read our article on technology trends on page 13.



SOLAR CHATTER

The U.S. Energy Information Administration (EIA) announced that renewables will make up 22 percent of electricity generation in the United States in 2022. This number is expected to rise to 24 percent in 2023, and renewable energy continues to carve out a larger portion of the total American energy portfolio.

Solar continues to show its strength in creating American manufacturing jobs, as the famed Pittsburgh Bethlehem Steel Plant has now been reopened to manufacture solar tracking systems. The factory, commissioned by Nextracker, is the third they've commissioned with a steel manufacturing partner this year.

Electric vehicles reached a critical adoption benchmark in the United States in June, as five percent of new car sales were fully electric. Financial analysts see reaching five percent as the breakout from the early-adopters phase, where the technology begins to become more mainstream and adoption begins rapidly accelerating. As adoption continues, car manufacturers begin a more rapid shift in supply, and through an accelerated learning curve and economies of scale, prices can fall quickly. We expect the incentives in the IRA will ensure this growth happens in North America, further growing domestic clean energy manufacturing capabilities.

Registrations opened for the U.S. Department of Energy's 2023 Solar Decathlon Design Challenge, where college students across the world compete to design sustainable buildings powered by renewable energy. Sol Systems has multiple Decathlon alumni, with Robertson's having taken second place in in the inaugural competition for the University of Virginia.

Omaha Public Power District (OPPD), the public utility responsible for electricity in and around Omaha, Nebraska, voted unanimously to delay the closure of its coal plant by three years, the sixth such delay to occur in 2022 alone. OPPD's reasoning mirrors similar decisions recently that citied tariffs and other supply chain constraints as well as interconnection delays in delaying closure of coal plants in favor of clean electricity like solar. These decisions will have myriad environmental and public health implications for local communities as well as globally.

SEIA recently released a Manufacturing Roadmap, laying a path for the U.S. manufacturing industry to thrive in the wake of the Inflation Reduction Act's (IRA) investments in reshoring and growing domestic manufacturing. SEIA shows how the U.S. can exceed 50 GW of domestic solar manufacturing capacity by 2030. A key element of this is the development of a well-trained workforce that brings new entrants into the clean energy space and helps current energy workers transition.

Monroe County Water Authority Flips The Switch On One Of NY's First Bifacial Solar Arrays

New York Power Authority, Sol Systems Develop Bifacial, Single-Axis Tracking Solar Project to Increase Energy Generation and Cost Savings for MCWA

Aug 11, 2022

ROCHESTER, NY – Monroe County Water Authority (MCWA) joined with the New York Power Authority (NYPA), developer Sol Systems, local dignitaries and elected officials today to celebrate the completion of its new 5 MWac ground-mounted solar array in Penfield with a 'flip the switch' ceremony. The project is one of the first in New York State to utilize bifacial solar modules and single axis tracking, which allows light to enter both sides of a panel, increasing total energy generation and also adjusting to track the movement of the sun.

The installation of the new solar array, located on the Water Authority's property at the corner of Penfield Road and Watson Hulbert Road, is part of the Water Authority's long-term goal to reduce energy expenses. The array is expected to generate 8 million kilowatt hours of electricity per year, which represents more than 15 percent of MCWA's energy needs for water pumping and treatment.

"Reliably providing quality, affordable water is our top priority. MCWA should realize substantial savings over the course of this 25-year contract, helping keep water rates affordable," said MCWA Executive Director Nick Noce. "Beyond the financial benefits of the solar array, utilizing sustainable, clean energy is a significant step forward in our commitment to environmental stewardship."

Through a competitive bid process led by NYPA, national solar energy developer Sol Systems in Washington D.C. was selected to install and operate the solar array at no expense to the Water Authority. In return, the kilowatt hours of energy produced by the panels are delivered to Rochester Gas & Electric and a percentage is credited to MCWA on its energy bills. The project also qualified for the New York State Energy Research and Development Authority (NYSERDA) solar energy incentive, which will pay nearly $1 million towards the project over the first two years of operation.

"The New York Power Authority is pleased to have played an energy advisor role for the Water Authority to help make this unique solar project happen in Monroe County," said Justin E. Driscoll, NYPA's interim president and CEO. "This prudent use of Water Authority land will make a new source of clean power available to the Water Authority. Monroe County residents and New Yorkers as a whole will benefit from further reduction in greenhouse gas emissions, which supports the state's ambitious clean energy goals. We commend the Water Authority's dedication to this clean energy project, even amidst the challenges that we faced together during the pandemic and over the last few years."

The Water Authority's new system will generate electricity to help support New York's clean energy goals, which includes achieving 70 percent renewables-sourced electricity by 2030 and a 100 percent carbon-free electricity sector by 2040. The state intends to build at least 10 gigawatts of distributed solar by 2030, enough to annually power nearly 700,000 homes.

"The economic and sustainable benefits of this project will be felt for years to come, and we are proud to have had such committed partners in MCWA and NYPA," said Anna Toenjes, Senior Director at Sol Systems. "In addition to providing clean energy and cost savings, the project's pollinator habitat will provide decades of positive impact to the local ecosystem."

The array spans approximately 29 acres. For sustainability, during construction, the site was planted with a seed mixture of pollinator plants, which will create new habitats for local pollinators in a boost to the surrounding ecosystem.

Sol Systems Adds Clean Energy Investment Chief

August 2, 2022

WASHINGTON, D.C. – Today, Sol Systems announced the addition of David Vickerman as Chief Financial Officer. Vickerman brings decades of executive and energy-industry experience to the Sol Systems team and will be focused on corporate and structured finance and development. Sol Systems is currently developing over 2 GW of new solar projects worth over $1 billion across the U.S.

Vickerman joins Sol Systems amid a generational shift toward renewable energy in the U.S. Although supply-chain delays and other logistical challenges persist, the solar industry is rapidly growing and is currently valued at over $33.1 billion. The renewable energy industry accounts for over 40 percent of the total U.S. energy job market, outpacing all other energy sectors, according to data published by the U.S Department of Energy.

“We’re proud to have a veteran like David help lead and build Sol,” said Yuri Horwitz, Sol Systems’ Chief Executive Officer. “His experience and expertise will fuel the continued expansion of our work driving a more sustainable future.”

Vickerman most recently served as a Managing Director for Macquarie Capital, a global investment bank. Prior to this role, Vickerman spent six years as Vice Chairman and Chief Operating Officer at Silicon Ranch Corporation, a US Solar IPP backed by Shell and Manulife Investment Management/John Hancock. Over his tenure at SRC, David also spent time, as Chief Corporate Development Officer, responsible for corporate finance, project finance, project development, EPC delivery and asset management.

Under Vickerman’s leadership, Silicon Ranch completed an institutional equity investment exceeding $140 million into the company by Partners Group, executed a subsequent equity transaction with Shell, and closed over $1.5 billion in solar project finance transactions. While Vickerman was at Silicon Ranch, the company grew its portfolio from 50 MW in operating solar assets to over 2.2 GW in operating and contracted solar assets.

Prior to his time at Silicon Ranch, David held senior positions at TD Greystone and other private financial firms. Vickerman holds a BSc in Mathematics from Western University in Ontario and an MBA from Wake Forest University, where he currently serves on the business school’s board of directors. Additionally, David completed the Rotman School’s Institute of Corporate Director’s Program at the University of Toronto.

Norfolk Completes Construction on the Largest Solar Farm in Nebraska

June 22, 2022

NORFOLK, Neb. – Today, the City of Norfolk, Nebraska Public Power District (NPPD), and members of the community celebrated the end of the construction phase for the largest solar farm in the state, which is paired with the NPPD's first large-scale battery storage system.

The 8.5 MW solar + battery storage system is developed and operated by solar energy developer Sol Systems in partnership with EPC firm GenPro Energy Solutions ("GenPro") and real estate development firm Mesner Development. The array is part of NPPD's community solar program, SunWise, allowing local Norfolk residents to purchase clean energy produced from the array at a fixed price to offset normal retail electricity. Sol Systems and NPPD entered a 30-year power purchase agreement for the energy of the array, providing a fixed cost of energy for NPPD and Norfolk residents for decades.

"The Norfolk community solar facility is going into operation, and it is great to officially celebrate the completion of the state's largest solar facility," says NPPD Account Manager Brittney Koenig. "Norfolk customers who have signed up for community solar shares began to see a credit on their bill starting in June."

"We're excited to officially launch this project. Participating community members will soon be able to utilize affordable, locally generated clean energy for the first time in this form and fashion. We're proud to have worked collaboratively with NPPD and the private sector to provide the opportunity. It adds to our quality of life," said Mayor Josh Moenning.

The large-scale battery storage system is capable of storing up to 2 MWh worth of electricity produced by the solar farm. This will allow NPPD to store solar energy for flexible discharge times, like summer evenings or winter morning during its grid peak times.

During construction, the project site was planted with pollinator habitats to support local bee and butterfly populations. Prairie flowers and grasses will build up a thriving native habitat, stabilizing and supporting soil health while providing habitat for species at risk.

In addition to the energy and educational benefits of the array, Sol Systems partnered with Northeast Community College (NECC) to establish three scholarships for students interested in the school's Electrical Construction and Control Program. The scholarships, which cover two years of tuition for students, were awarded this spring. In further partnership with NECC, internships with GenPro were established for students already enrolled in the Electrical Construction and Control Program, providing them with hands-on experience helping to construct the array.

"Sol Systems is proud to be a part of this solar + storage project with NPPD and the City of Norfolk because it fully captures what is at the core of Sol's mission," said Anna Toenjes, Senior Director of Business Development at Sol Systems. "The project will service this community with clean, renewable energy for decades while creating strong community

impact through our scholarship work with NECC. In addition, I am personally proud to have been a part of an all-female team at Sol that led the contract negotiations, development and financing of this solar + storage project"

"As the EPC who has constructed the most municipal solar arrays in the State of Nebraska, it is really important that we can give back to the communities we serve," said Molly Brown, EVP of Corporate Strategy at GenPro. "Education is at the core of who we are, and the partnership with NECC allowed us to train the next generation of solar electricians. We need more skilled labor as this industry continues to grow."

"We are proud to be part of the ongoing effort to develop clean energy in Nebraska," said Cliff Mesner, Owner of Mesner Development. "Our mission is to provide every Nebraska community with the opportunity for high quality, affordable clean energy integrated with local public power districts and municipal utilities. We believe in public power and we are inspired by the leadership in Norfolk, NE."

DEVELOPMENT PARTNERSHIPS

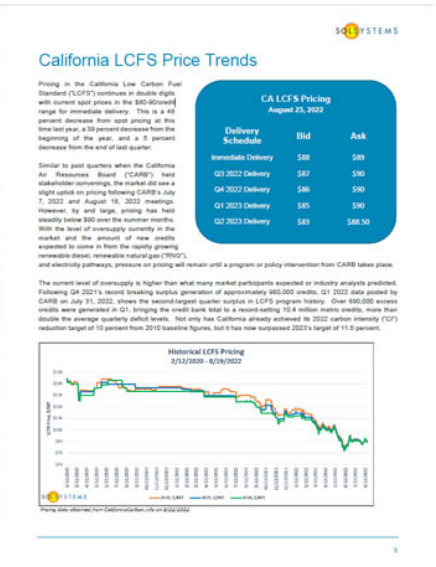
Sol Systems is currently developing utility-scale projects across the U.S., and is working with developers to provide optimal financial solutions for their projects, leveraging our ability to structure unique financial vehicles for environmental commodities. See below a list of our projects under development, click the links on their name to learn more.

Project	Size	Location
Eldorado	150 MW	Saline County, IL
Tilden	150 MW	Randolph County, IL
Prairie Creek	37 MW	Morgan County, IL

Interested developers and financiers should reach out to finance@solsystems.com

The Sol Standard August 2022 edition is out!

The Sol Standard, Sol Systems new LCFS and clean fuels newsletter provides up-to-date pricing data, market analysis, and policy trends to keep clients up to speed on the country's growing low carbon and clean fuels programs. **Download the newsletter and sign-up to receive future editions.**



WHERE WE'LL BE

RENEWING WHAT'S POSSIBLE

September 19-22, 2022

In addition to a heavy presence at solar's largest annual trade event, Sol Systems will be speaking on a number of panels, listed below. If you and your company will be attending the event, shoot us a line as we would love to meet your team.

Bringing DERs to All BIPOC Communities

Tuesday, September 20, 11am–12 pm

Sol Systems Director of Impact **Adaora Ifebigh** will dive into issues of equity, access, and environmental justice in the renewable space, focusing on bringing distributed energy resources (DERs) into communities of color.

Corporates Leading New Tax Equity Investment

Tuesday, September 20, 2:30pm–-3:30 pm

Sol Systems Vice President of Structured Finance **Gabe Wuebben** joins fellow panelists to discuss the unique characteristics and strategies corporate tax equity investors are employing to move the industry forward and the role new legislation in the Inflation Reduction Act will make in this process.

Corporate Financing Solutions for a Carbon-Free Future

Wednesday, September 21, 9:30-10:00 am

Sol Systems Chief Financial Officer **David Vickerman** will be discussing how corporations and other large energy consumers have begun shifing capital investment and business strategies in response to customer/stockholder demand, perceived risk and improved economics of large-scale clean energy generation.

CONTACT US

If you have any questions about this information, wish to receive our newsletter via email, please contact our team. We would love to hear from you.

888.235.1538 or **SOURCE@solsystems.com**