U.S. Solar Market Overview & Trends

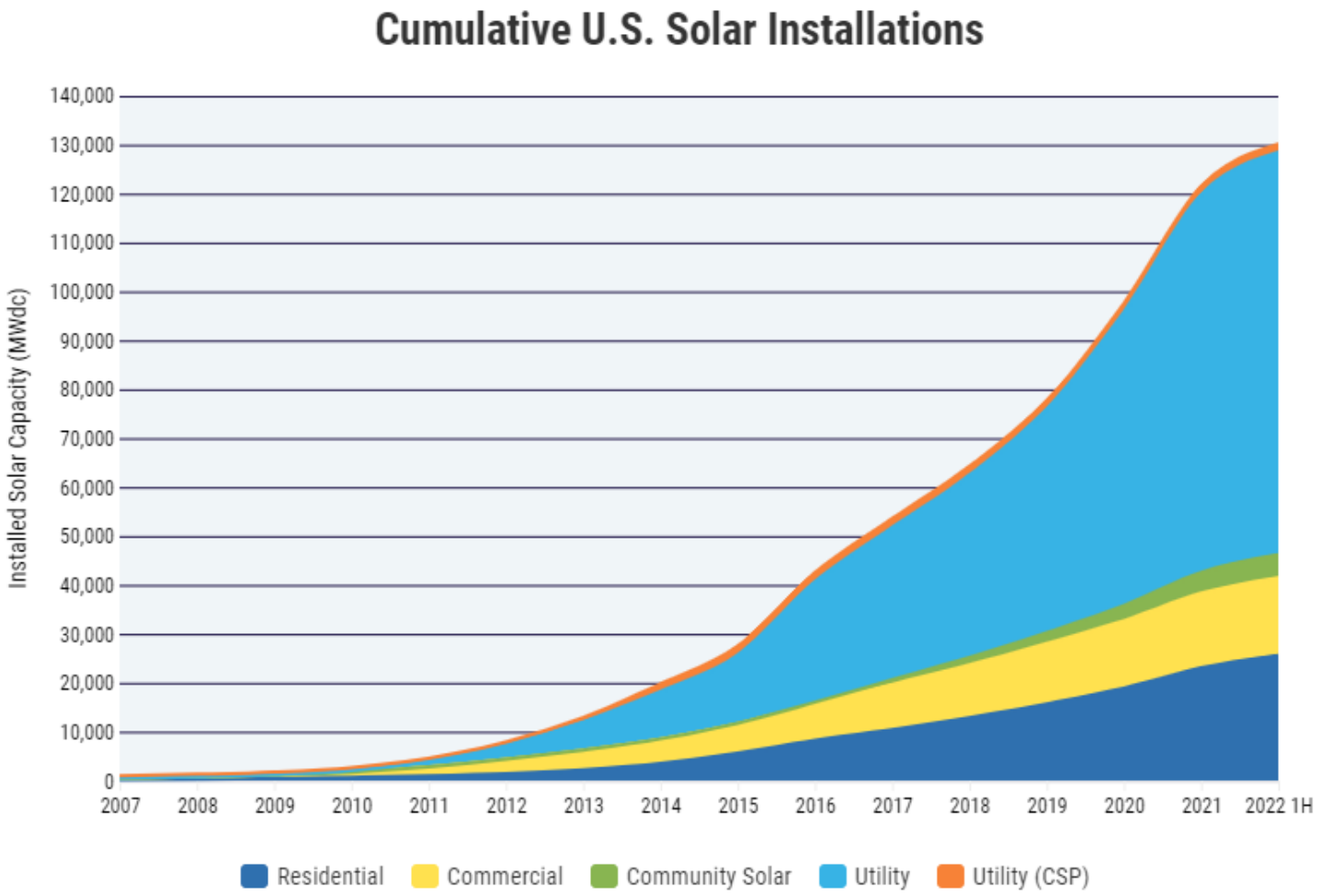
October 2022

Solar Energy Industries Association

SEIA Solar Energy Industries Association®

Powering the Solar+ Decade

Massive Growth Since 2000 Sets the Stage for the Solar+ Decade

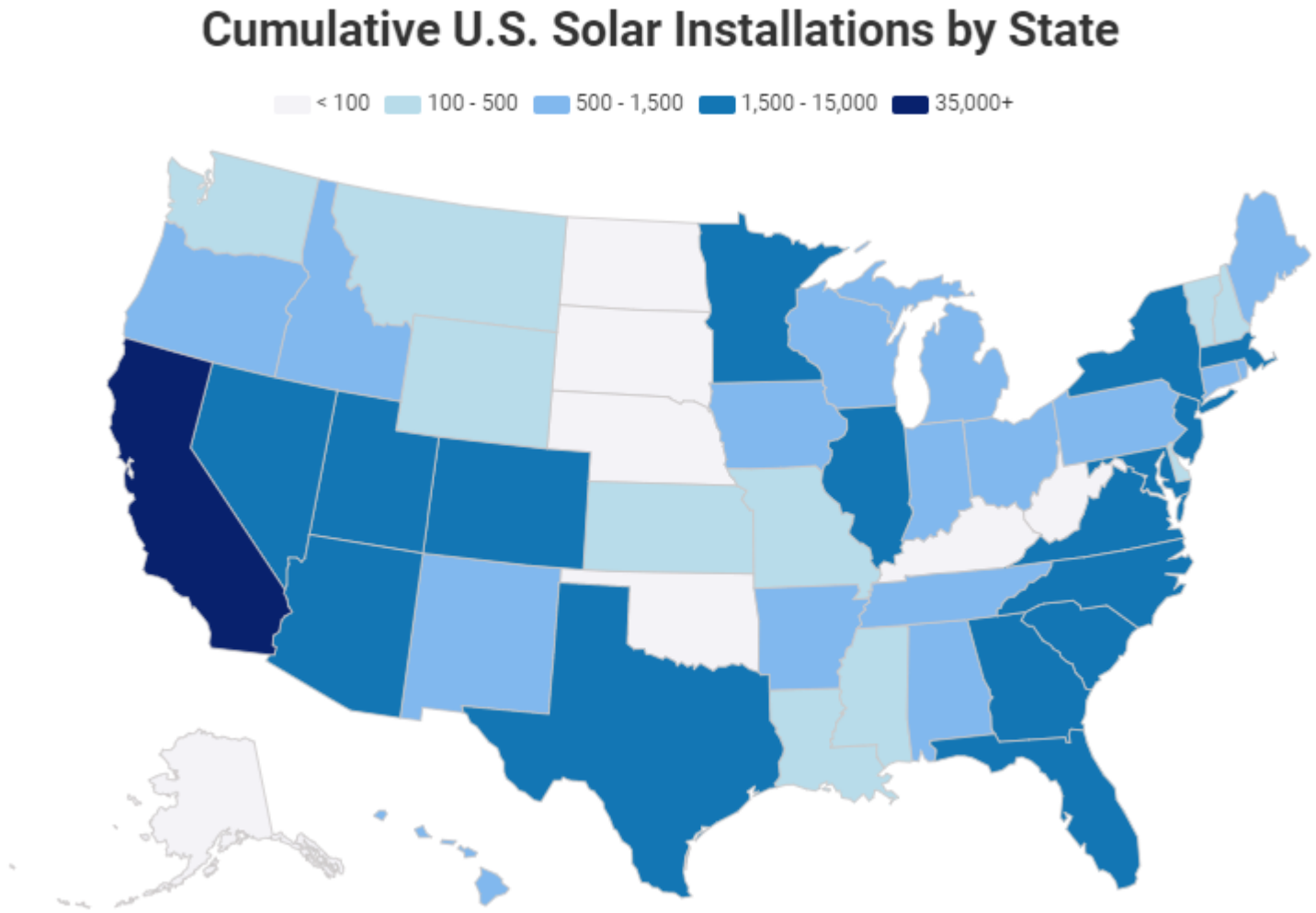


In the last decade alone, solar has experienced an average annual growth rate of 33%.

Thanks to strong federal policies like the solar Investment Tax Credit, rapidly declining costs, and increasing demand across the private and public sector for clean electricity, there are now more than 130.9 gigawatts (GW) of solar capacity installed nationwide, enough to power 23 million homes.

Source: SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight Q3 2022

The U.S. is becoming a 50-State Solar Market



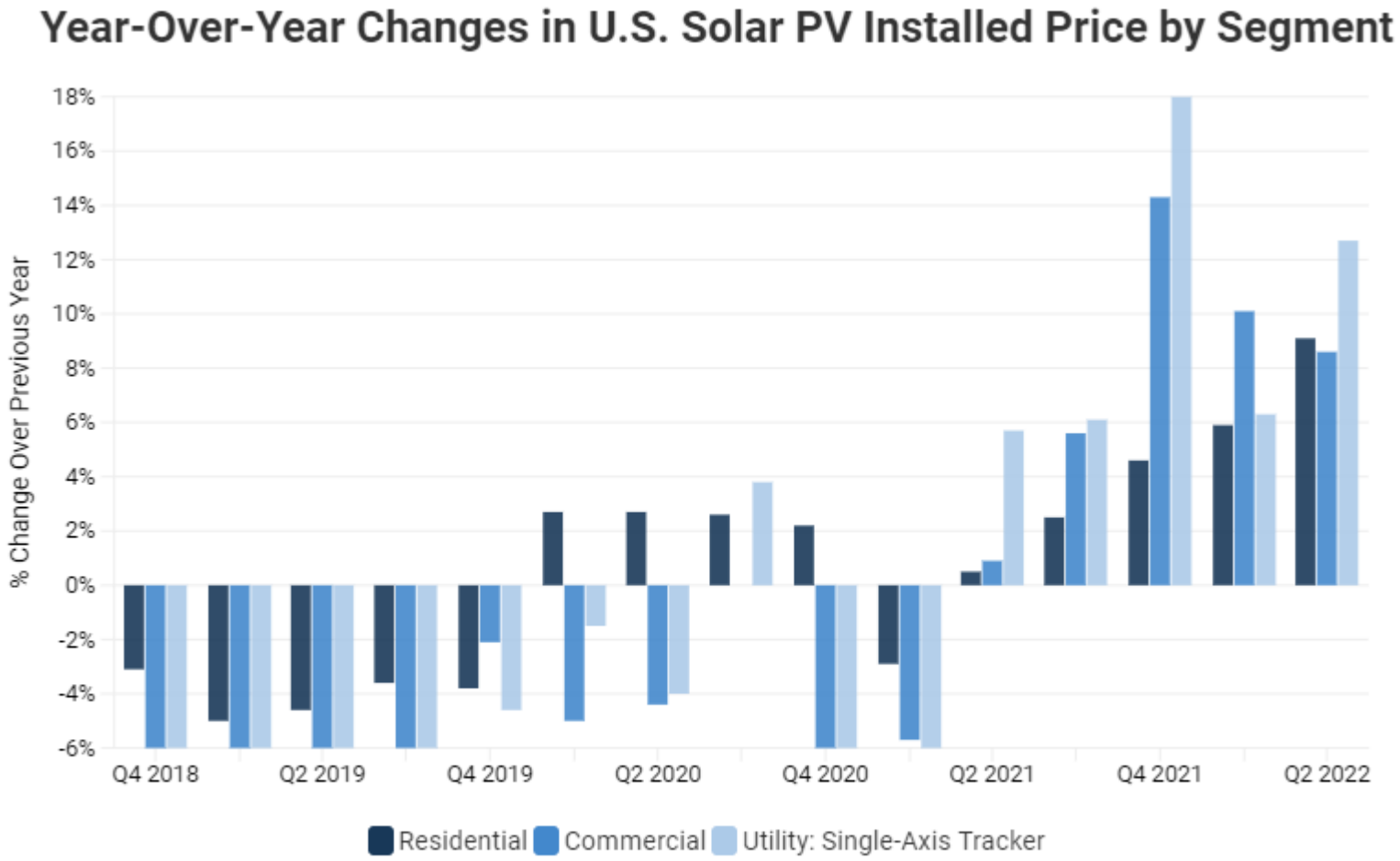
Source: SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight Q3 2022

While California has traditionally dominated the U.S. solar market, other markets are continuing to expand rapidly.

In 2021, states outside of California made up their largest share of the market in the last decade, led by rapid growth in Florida and Texas.

As demand for solar continues to grow, new state entrants will grab an increasing share of the national market.

Supply Chain Constraints Lead to Price Increases



Source: SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight Q3 2022

However, over the last 18 months, shipping constraints and other supply chain challenges stemming from the global pandemic and trade instability have led to price increases across the U.S. solar industry.

For the fifth consecutive quarter, year over year prices have increased across all market segments leaving utility-scale solar prices 12.7% higher than they were a year ago.

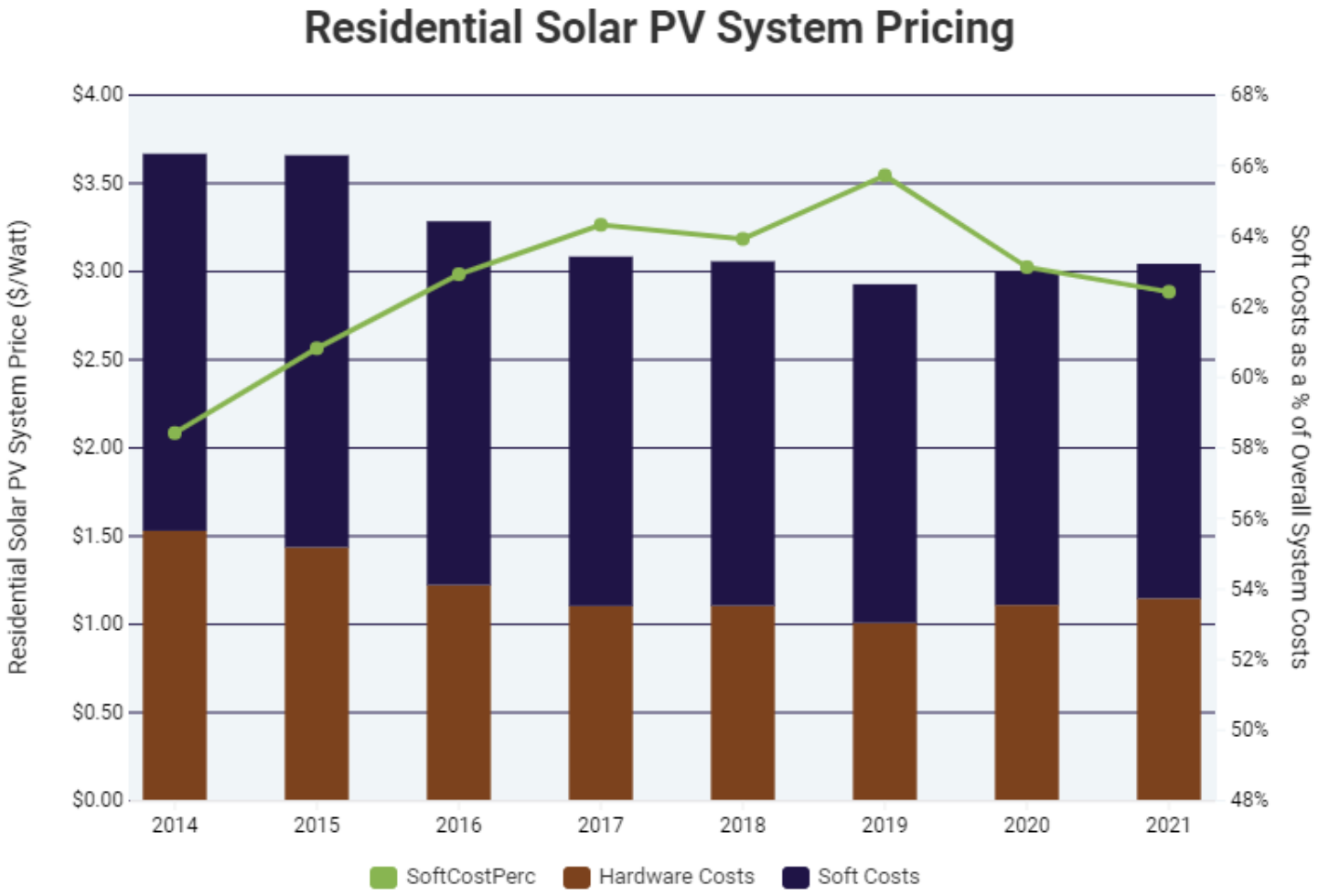
Price increases have impacted deployment, with 2022 installation forecasts dropping from 30 GW to 15 GW over the last year.

Prices Decline for Rooftop Solar, but Higher Soft Costs Remain

The biggest cost-decline opportunity in residential and small commercial solar exists in soft costs, which includes installation labor, customer acquisition, and permitting/inspection/interconnection.

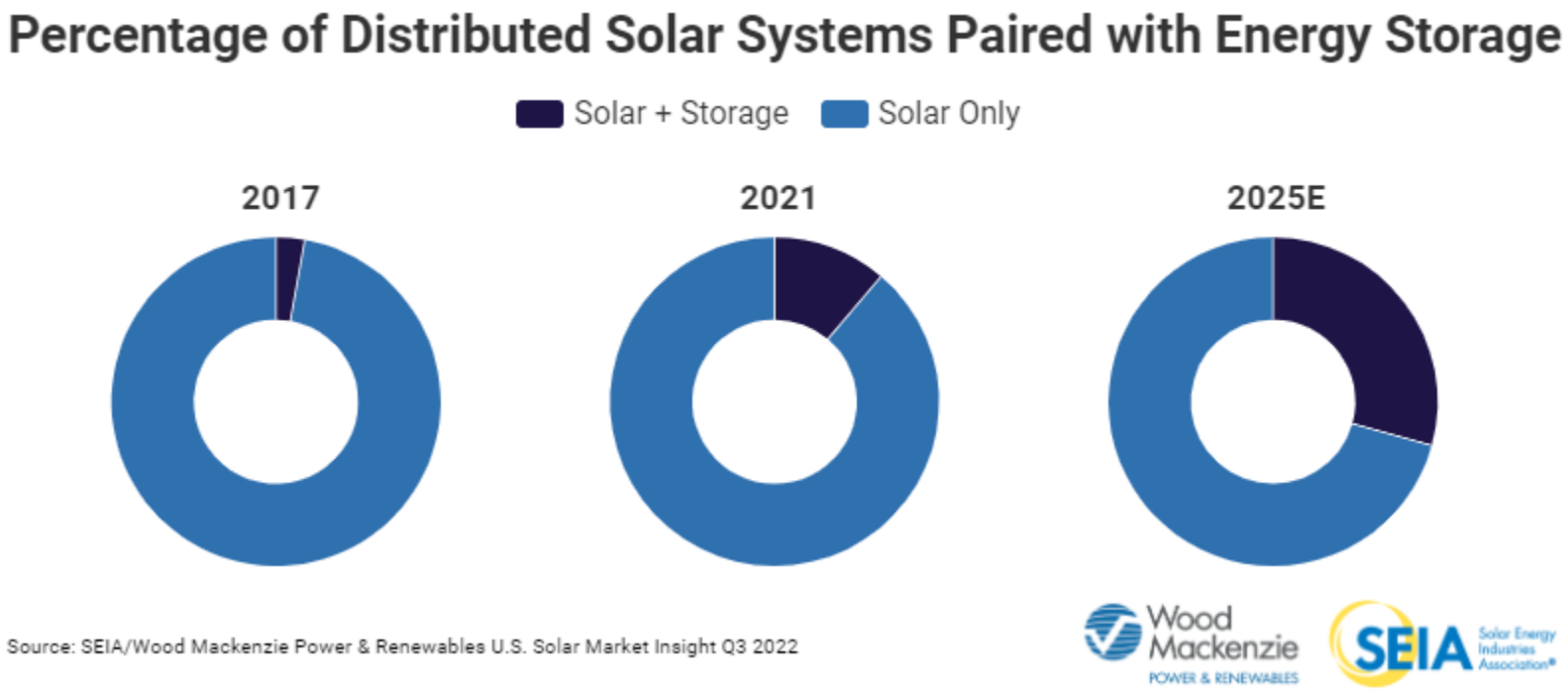
While the soft cost share of total system costs has stabilized in recent months due to increased customer demand, rising hardware costs and pandemic-related improvements to permitting practices, U.S. solar soft costs continue to be much higher than those of other developed solar markets around the world.

Through programs like Solar Automated Permit Processing (SolarAPP) and SolSmart, SEIA and our partners are working to reduce local barriers to going solar.



Source: SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight Q3 2022

Storage is Increasingly Paired with All Forms of Solar



Homeowners and businesses are increasingly demanding solar systems that are paired with battery storage.

While this pairing is still relatively new, the growth over the next five years is expected to be significant. By 2025, over 29% of all new behind-the-meter solar systems will be paired with storage, compared to under 11% in 2021.

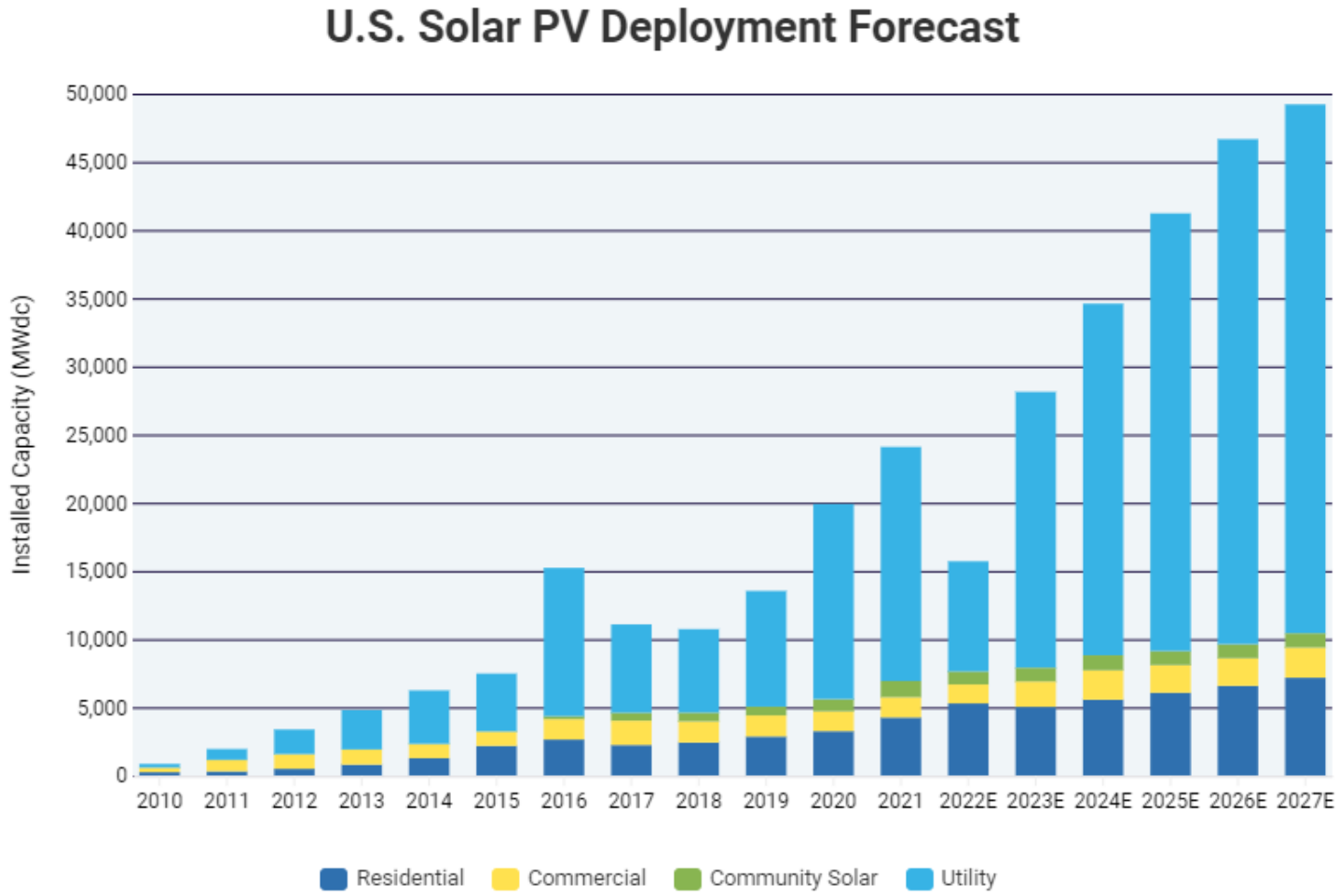
The utility-scale market is also recognizing the benefits of pairing solar with storage, with over 45 GW of commissioned or announced projects paired with storage, representing over 50 GWh of storage capacity.

Solar PV Growth Forecast

Pricing and procurement challenges have greatly impacted deployment in 2022, resulting in forecasted deployment levels reaching their lowest point since 2019. However, a return to a steady state of supply in 2023 should put the solar market back on track.

The Inflation Reduction Act is expected to bring about unprecedented growth in the industry. Over the next five years, the industry is expected to install nearly 200 GW of new solar capacity, more than doubling the amount of solar currently installed.

The legislation provides key tax incentives and long-term certainty that will spark demand for solar and storage and accelerate the transition to renewable energy.



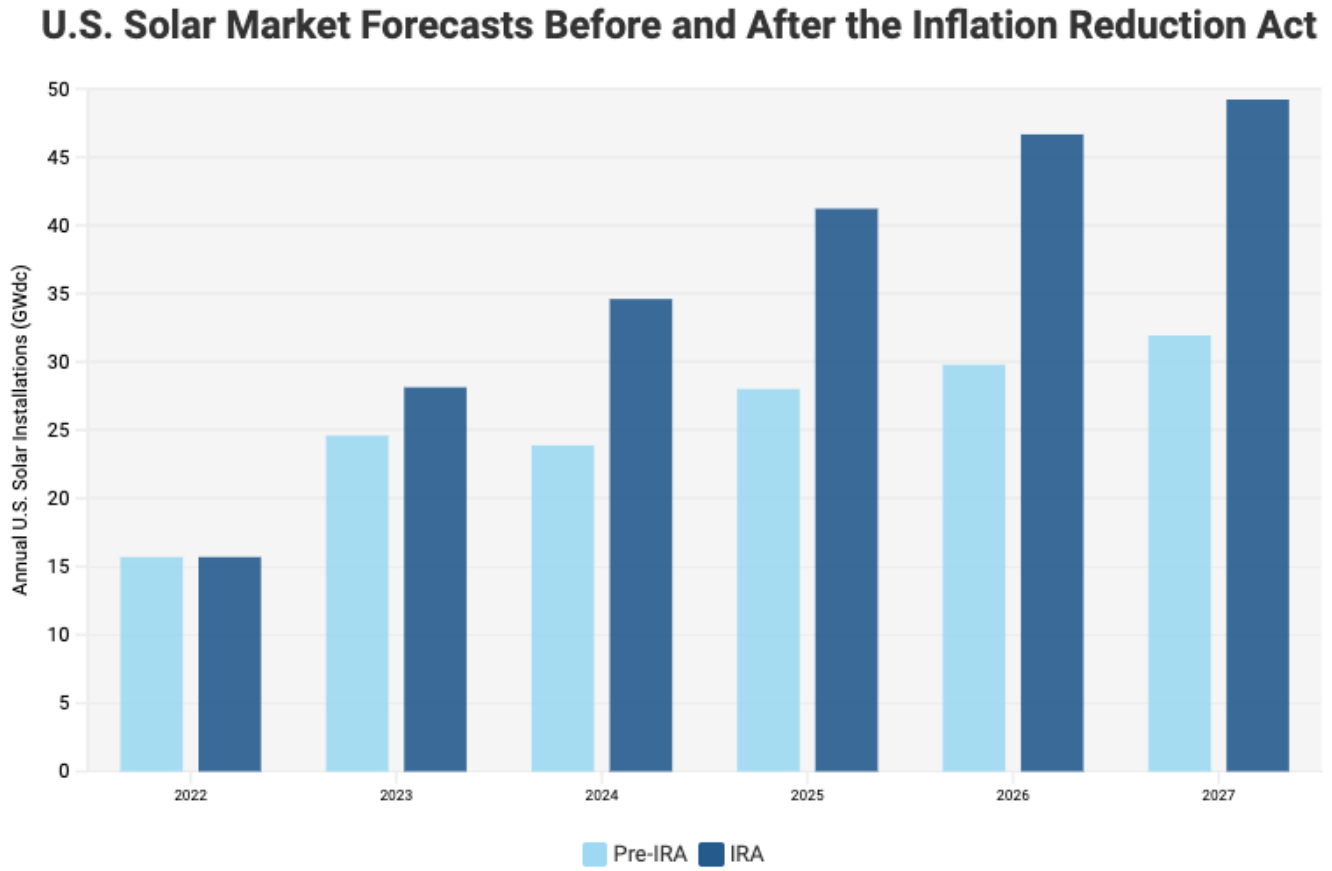
SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight Q3 2022

Inflation Reduction Act Boosts Solar Outlook

The passage of the Inflation Reduction Act has drastically improved baseline projections for the solar industry over the next five years.

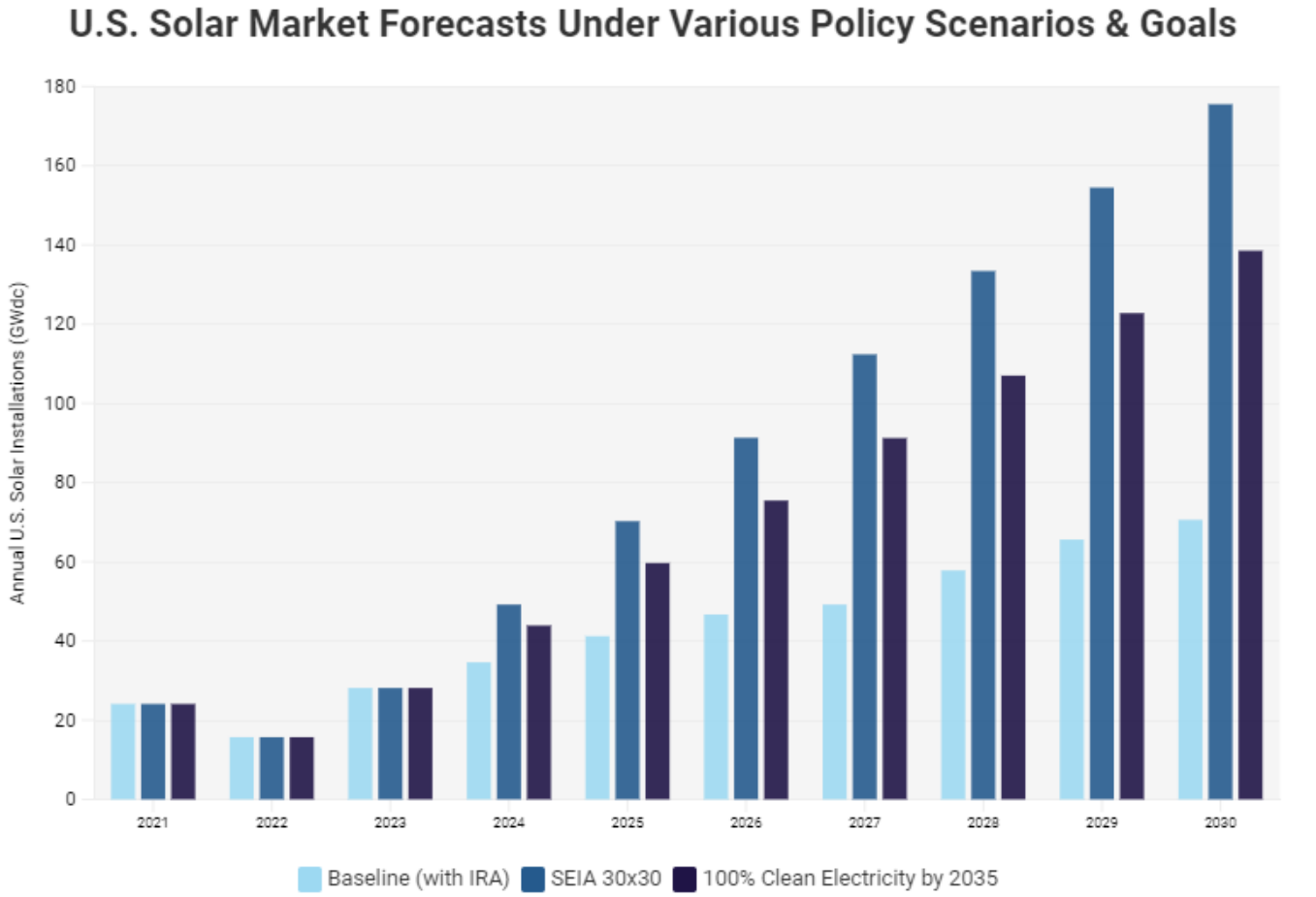
In the next half decade, the long-term tax incentives and manufacturing provisions in the IRA provide the market certainty needed to boost expected solar deployment by over 40% compared to pre-IRA projections.

Though supply chain issues limit the impact of the IRA in the near term, its passage creates massive growth potential as new manufacturing capacity comes online and other supply barriers are addressed.



Source: SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight Q3 2022

More Aggressive Growth Needed to Reach Climate Goals



Sources: SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight Report 2022 Q3, SEIA 30x30 Analysis, SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight Q3 2022

While projected growth over the next 10 years spurred by the IRA puts the solar market in reach of ambitious clean energy goals set by the industry and the Biden administration, more work is needed to achieve the pace required for a 100% clean energy electricity system.

Annual installs will need to grow from less than 25 GW in 2021 to more than 130 GW by 2030, with cumulative totals over 800 GW by the end of the decade.

A combination of private sector innovation and stable, long-term public policy will set the solar industry on a path to achieving these more aggressive goals to address climate change and decarbonize the economy.

The Inflation Reduction Act, Explained

What the Biggest Clean Energy Bill in History Means for Your Business

October 2022

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Powering the Solar+ Decade

The Journey to Today

- **IRA signed into law by President Biden on August 16th, 2022**
  - SEIA organized tens of thousands of letters, hundreds of company meetings, over 100 sites visits
    - Focused work in key states
      - Pioneered a proactive manufacturing agenda that is already yielding domestic investments
        - Membership is an investment in the country, investment in climate, investment in our industry's future

Section 48 Investment Tax Credit and Production Tax Credit >1 MW_{AC}

Pre-Guidance through 2024

ITC: 30%

PTC: 100%

60 Days Post-Guidance through 2024

ITC: 6%+24%

PTC: 20%+80%

Tech Neutral 48E

2025-2032+

ITC: 6%+24%

PTC: 20%+80%

Labor Policy

Prevailing Wage

Apprenticeship Requirements

Prevailing Wage

- Applies during construction and 5 years after a project is placed in service for ITC, and 10 years for solar PTC.
- Applies to construction, alteration, and repair; and only to repair and alteration during 5 and 10- year period.

Apprenticeships

- *Registered Apprenticeship Program*
  - *Total hours* in construction, alteration, or repair performed by contractor or subcontractor with exclusions

    2022: 10% 2023: 12.5% 2024 + : 15%
- *Participation*
  - Each taxpayer, contractor, or subcontractor who employs 4 or more individuals shall employ 1 or more qualified apprentices


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Adder Credits
Domestic Content
Energy Communities
Low Income Allocated
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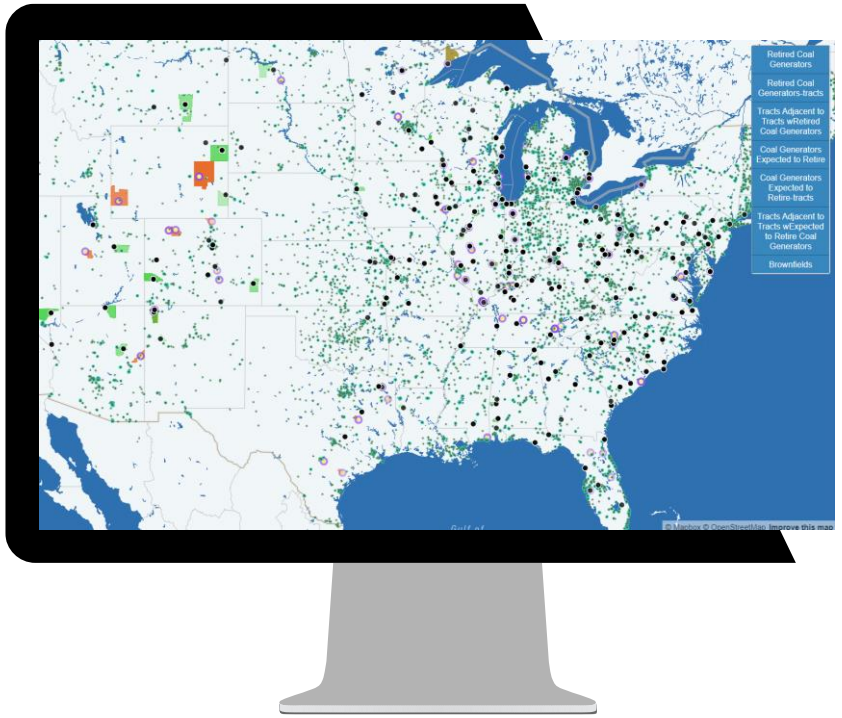
Adder Credits

- **Energy Communities**
  - Certain areas with histories related to fossil fuel extraction, use and employment.
  - Map tool for premium SEIA members to view coal-fired power plants that have retired since 2010 or have expired retirements through 2036, as well as the census tracts (and adjacent tracts) to these facilities
- **Domestic Content**
  - CFR 661
  - 100% Steel/Iron (661.5)
  - 40% Manufactured Products (40/45/50/55%)
- **Low Income Allocated Credit**
  - 10%: the project is located in a low-income community or on tribal land
  - 20%: the project is part of a qualified low-income residential building project or a qualified low-income economic benefit project
  - 1.8 GW_{DC} total per year



www.seia.org/ECmap

Section 25D
30% ITC for 10 years followed by a phase down

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Credit Prior to IRA	26%	22%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Credit Under IRA	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	26%	22%	0%

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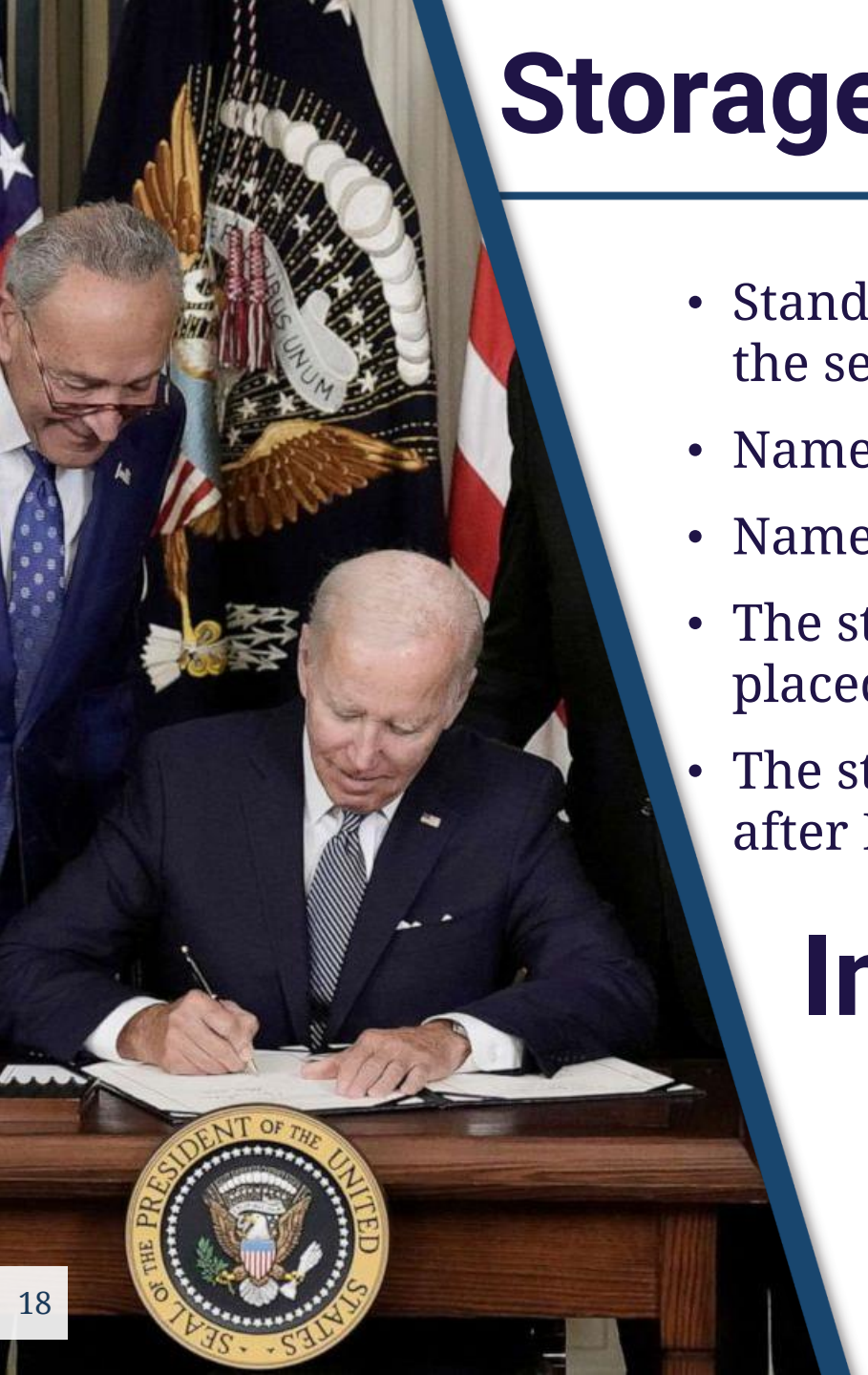
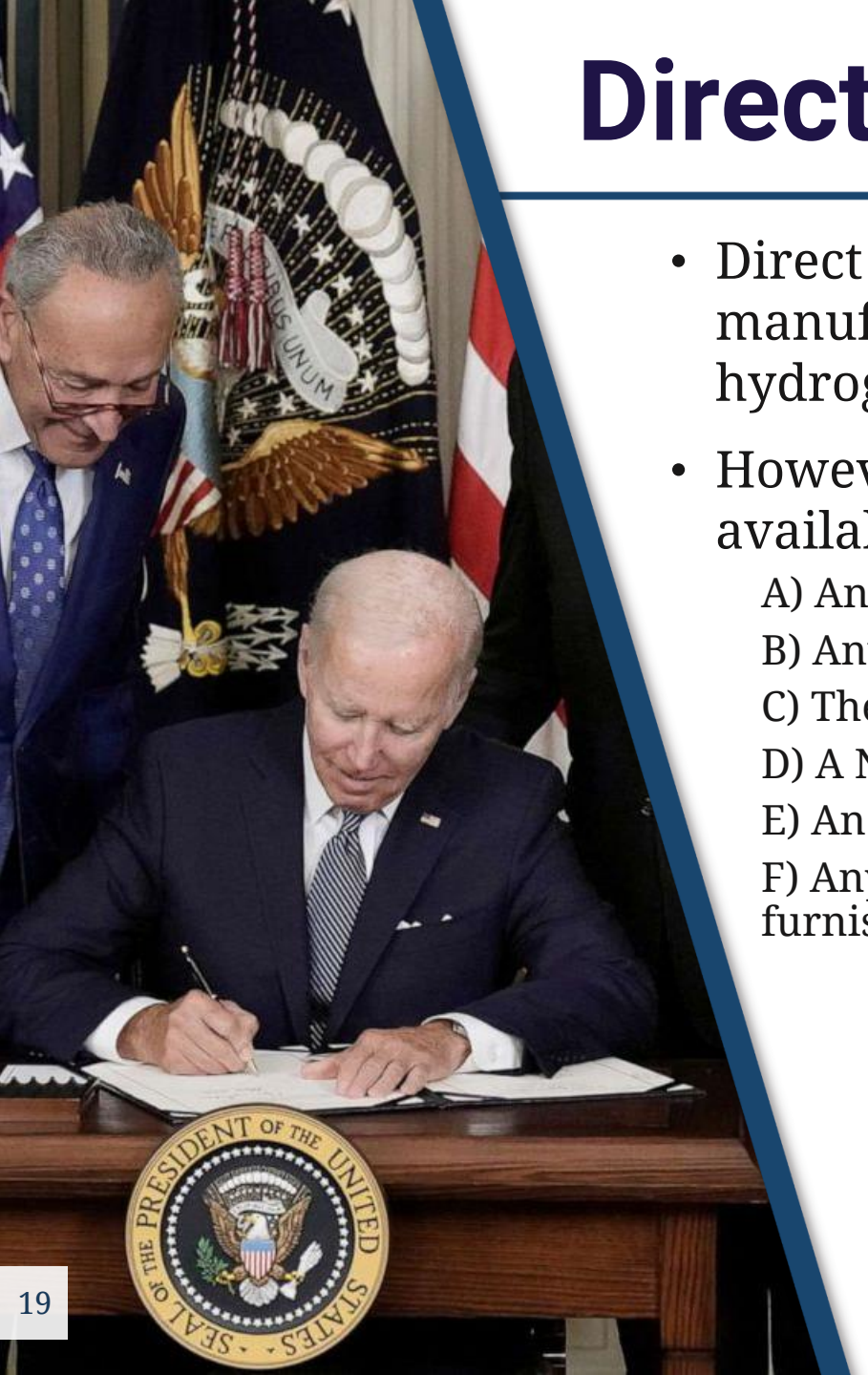


Storage ITC

- Standalone energy storage projects are added as qualifying under the section 48 ITC and for 25D.
- Nameplate capacity of not less than 5 kilowatt hours for Sec. 48
- Nameplate capacity of not less than 3 kilowatt hours for 25D.
- The standalone storage credit for section 48 is available for projects placed in service after December 31, 2022.
- The storage credit for 25D is available for expenditures made after December 31, 2022.

Interconnection

- For projects below 5 MW, interconnection costs can be included in Sec. 48 ITC.



Direct Pay

- Direct pay generally is available to companies only for manufacturing production credits (45X) as well as for hydrogen projects and carbon capture projects.
- However, direct pay for other energy projects is only available for certain entities:
  - A) Any entity exempt from the tax under Title A
  - B) Any State government (or political subdivision thereof),
  - C) The Tennessee Valley Authority
  - D) A Native American tribal government
  - E) An Alaska Native Corporation.
  - F) Any corporation operating on a cooperative basis which is engaged in furnishing electric energy to persons in rural areas

For those that can qualify for direct pay -- a project loses its ability to receive 100% direct pay over time absent meeting domestic content requirements. 100% direct pay in 2023, 90% in 2024, 85% in 2025, then 0%.

Transferability

- Companies (for example, developers) may choose to transfer the ITC or PTC to another taxpayer (as well as other credits including
- A transferee (the party receiving a transferred credit) must pay for the credit in cash, and the funds received for the credit won't be included in the gross income of the original recipient of the credit, and the transferee can't deduct the amount paid for the credit.
- The provisions include the process for transferring the credit within a partnership, and a credit may not be transferred twice.

Catalyzing American Solar Manufacturing

- A roadmap to achieving 50 GW of domestic solar manufacturing capacity by 2030
- IRA is a gamechanger
- Investments will take time:
  - 2-3 years for modules, trackers, inverters, backsheet, and solar glass
  - 3-5 years for metallurgical grade silicon and polysilicon upgrades plus new ingot/wafer and cell capacity
- Building a well-trained and diverse manufacturing workforce

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Environmental and Climate Justice Block Grants

1. $3 billion block grant for environmental justice projects for disadvantaged communities.

2. Eligible projects include those that address environmental harms in low-income and disadvantaged communities related to: pollution monitoring, investment in zero-emission infrastructure, transportation emissions reduction, climate resiliency, pollution prevention, and deployment of low-and zero-emission energy technologies.

3. The structure and administration of this block grant will need to be further defined through the EPA's regulatory process.

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Greenhouse Gas Reduction Funds

This bill creates numerous programs providing grants and other financial assistance for projects that reduce GHG emissions, including:

- $27 billion for a Greenhouse Gas Reduction Fund that will provide technology-neutral funding to states, nonprofits, and other institutions for projects that reduce or avoid GHG emissions and other forms of air pollution.
- $8 billion of this funding is specifically earmarked for low-income and disadvantaged communities.
- $5 billion in competitive grants to states, tribes, and municipalities to develop and implement GHG emissions reduction plans.
- $7 billion for zero-emission technologies, including "distributed technologies on residential rooftops"

Questions?