



U.S. DEPARTMENT OF
ENERGY

The U.S. Energy Revolution and the Inflation Reduction Act (IRA)

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Outline



Legislation



IRA Clean Power Tax Credits



DOE Programming



Grid and Connectivity Work



Manufacturing an Energy Transition

U.S. Net-Zero Goals

The U.S. has set the following goals:

- A zero-carbon power sector by 2035
- Net-zero emissions economy-wide by 2050
- Demand-side emissions reductions goals across:
 - Buildings – net-zero by 2045
 - Vehicles – 100% zero-emissions vehicle sales by 2035
 - Federal operations – net-zero by 2050

New Laws Are Revolutionizing Energy

- 1. Bipartisan Infrastructure Law (BIL) (November 2021)** makes the largest long-term investment in our nation's infrastructure in a century
- 2. CHIPS and Science Act (July 2022)** invests in cutting-edge science and innovation to boost American competitiveness, with an emphasis on semiconductors
- 3. Inflation Reduction Act or IRA (August 2022)** breathes life into our clean energy economy by incentivizing deployment of clean technologies and lowering energy costs for American families



President Biden Signs the Bipartisan Infrastructure Bill into law. Photo Credit: Kenny Holston/Getty Images

IRA: Economy-Wide Impact

- Invests \$369+ billion in tax credits, loans, and grants—the largest investment in clean energy and climate action
- Puts the United States on a path to meet our Paris commitment of cutting our emissions by 50-52 percent below 2005 levels by 2030.



**Clean Energy
Deployment**



**Climate-Smart
Agriculture**



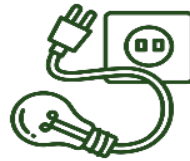
**Electric Vehicles and
Clean Fuels**



**Manufacturing and Industrial
Decarbonization**



**Conservation and
Resilience**



**Clean, Energy Efficient
Buildings**



**Pollution Reduction and
Environmental Justice**

IRA: Government-Enabled, Private Sector-Led Approach

- Vast majority of the Inflation Reduction Act goes toward **clean energy tax credits** that provide policy certainty for companies to make bigger investments in clean energy, faster. Bonus credits incentivize strong labor standards, fair wages, and investment in low-income and traditional fossil fuel communities.
- Already, **\$224 billion in private sector clean energy investments** covering nearly every U.S. state have been announced since the Inflation Reduction Act became law. Top industries for post-IRA manufacturing investment growth in the United States have been electric vehicles (>\$17B), batteries (>\$84B), and solar (\$13B).
- New programs and loans: New energy and climate programs work alongside tax credits to **support projects in disadvantaged communities**



IRA Clean Power Tax Credits



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Clean Electricity

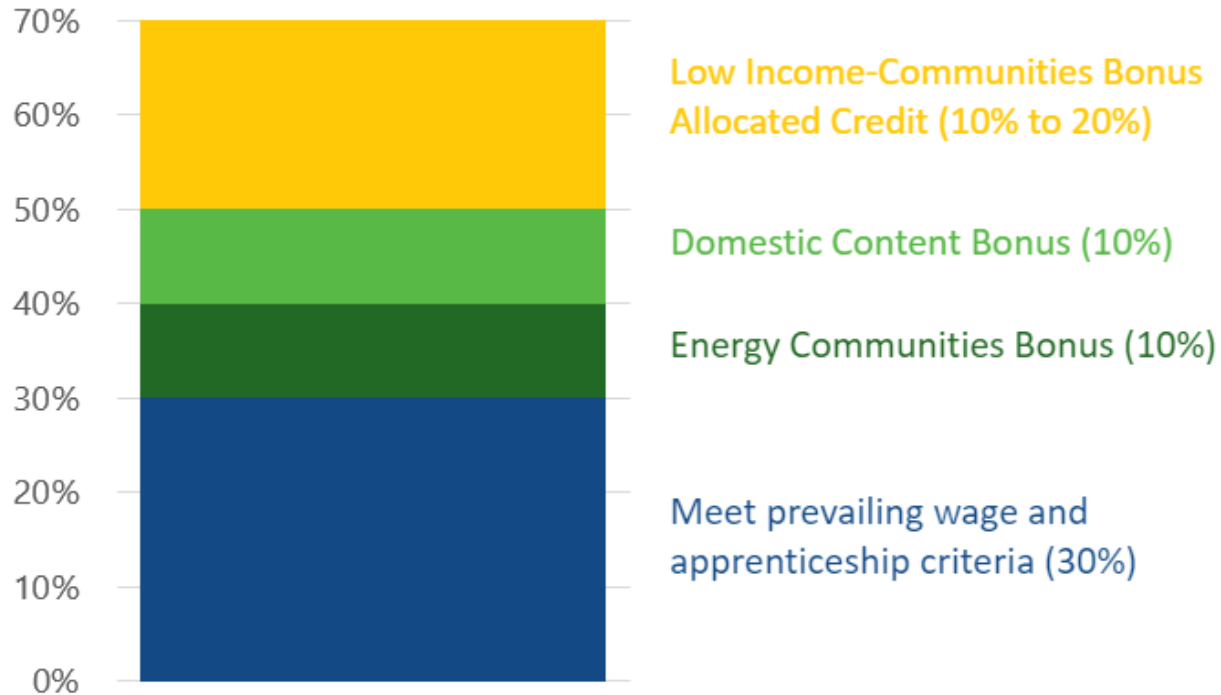
- Technology-neutral clean electricity Production Tax Credits (PTCs) and Investment Tax Credits (ITCs)
 - All zero-emitting technologies qualify, including renewables, new nuclear, and energy storage
 - Bonuses domestic content, and wind and solar benefiting low-income communities
- PTC for existing nuclear through 2032
- Carbon capture, storage & utilization credits extended & expanded
- New provisions allow a wider variety of investors, including non-profits and public power, to benefit from clean electricity tax incentives

Clean Electricity IRA Tax Credits

	Technology-Specific 45 PTC, 48 ITC	Technology-Neutral 45Y PTC, 48E ITC
Credit	Available to commercial taxpayers installing certain energy or electricity equipment.	Available to commercial taxpayers installing new clean electricity facility (or expansion of existing).
Technologies	Each credit is <i>technology specific</i> , mostly covers all renewables. Some technologies able to chose one or the other.	Each credit is <i>technology neutral</i> , anything with zero or negative emission electricity qualifies.
Value	Credit (w/ prevailing wage and apprenticeship) is 30% for ITC, \$27.5/MWh for first 10 years for PTC. 5x lower w/o wage requirement.	Credit (w/ prevailing wage and apprenticeship) is 30% for ITC, \$27.5/MWh* for first 10 years for PTC.* 5x lower w/o wage requirement.
Bonuses	10% bonus for meeting energy community or domestic content requirements. Bonuses are stackable.	
Timeline	Extended for projects beginning construction before 2025. Then transitions to technology-neutral \$48E ITC and \$45Y PTC.	For facilities placed in service in 2025 or later. Four-year phaseout begins only after power sector emission reach 25% of 2022 levels.

Clean Electricity Investment Tax Credit Example

Total Investment Tax Credit



Credit is 5x lower if not meeting wage and apprenticeship criteria

Tax credits and bonuses can stack, creating possibly large credit values.

A hypothetical 1 MW community solar facility costing \$1 million could earn a **70% tax credit** worth \$700,000

If it is owned by a tax-exempt entity, this could be a **direct cash payment** from the IRS

DOE Programming



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DOE: New Mandates and Unprecedented Funding

Hydrogen

Buildings: efficiency & electrification

Carbon Management

Energy Storage

Electric Grid

Cybersecurity

\$90B in Grants and Rebates
\$250B+ In Loans and Loan Guarantees

Critical Minerals/Materials

Domestic Supply Chains

EVs and Chargers

State, Local, Tribal Partnership

Workforce

Clean Energy Projects

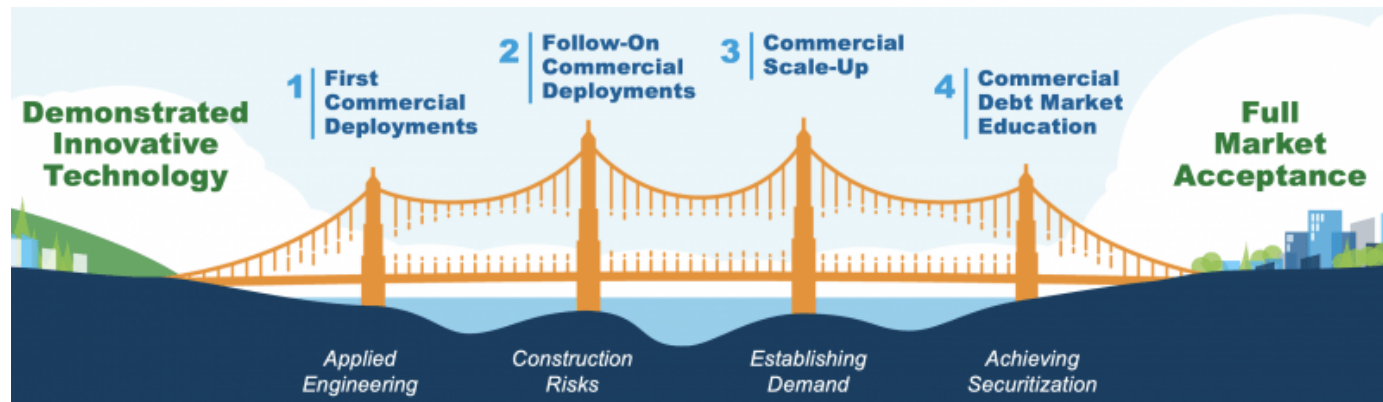
DOE Funding Impacts

- **Provides DOE ~\$35 billion to invest in clean energy**
 - **\$14 billion** for loans (LPO Energy Infrastructure Reinvestment Program, Advanced Technology Vehicle Manufacturing, Domestic Manufacturing Conversion Grants, Section 1703 program from Energy Act 2005)
 - **\$9 billion** for buildings (High-Efficiency Electric Home Rebates, HOMES, energy code adoptions)
 - **\$6 billion** for manufacturing (Advanced Industrial Facilities Deployment)
 - **\$3 billion** for the electric grid
 - **\$2 billion** for national lab infrastructure (SC, FECM, NE, EERE)
 - **Over \$1 billion** for other, incl DPA, Tribal energy, advanced nuclear fuel (HALEU), etc.
 - **\$250 million** for Defense Production Act funding for heat pump manufacturing

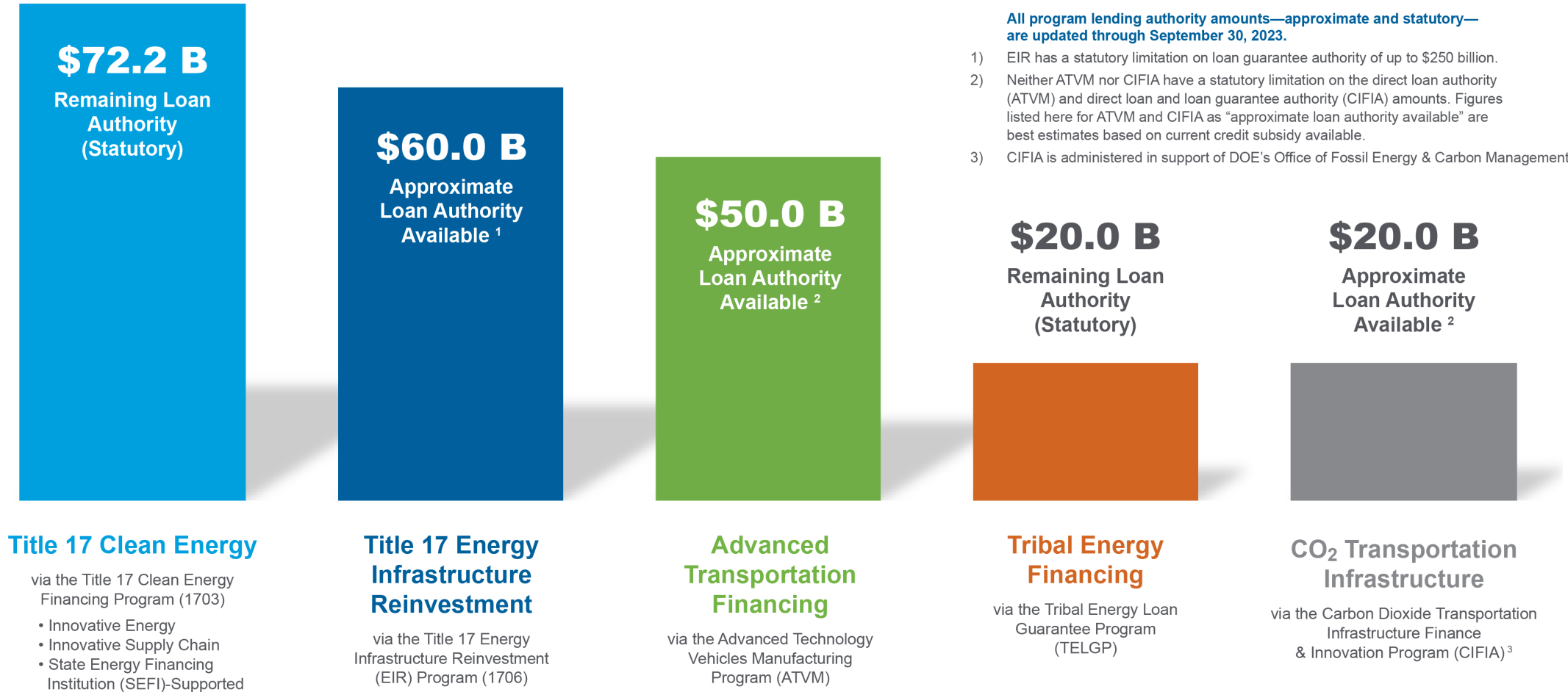


DOE Loan Programs Office Expansion

- New \$250 billion loan authority for Energy Infrastructure Reinvestment program
 - For projects that retool, repower, repurpose, or replace energy infrastructure that has already retired
 - And for operating energy infrastructure to avoid, reduce, sequester, or use air pollution or GHG emissions
- Expansion of LPO's existing loan programs:
 - Triples loan authority for innovative energy technologies (\$40 billion)
 - Eliminates cap on loan authority for clean vehicle manufacturing
 - Provides 10x increase in loan authority for Tribal energy programs (\$20 billion)
- Appropriates total of \$11.7 billion to LPO to issue new loans



Estimated Remaining Loan Authority for LPO Financing Programs



Notes

All program lending authority amounts—approximate and statutory—are updated through September 30, 2023.

- 1) EIR has a statutory limitation on loan guarantee authority of up to \$250 billion.
- 2) Neither ATVM nor CIFIA have a statutory limitation on the direct loan authority (ATVM) and direct loan and loan guarantee authority (CIFIA) amounts. Figures listed here for ATVM and CIFIA as “approximate loan authority available” are best estimates based on current credit subsidy available.
- 3) CIFIA is administered in support of DOE’s Office of Fossil Energy & Carbon Management.

Grid and Connectivity Work



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Strengthening Electric Grids and Clean Energy Generation with BIL

Bringing the electrical grid into the 21st century

- Invest **\$11 billion** in grants for states, tribes, and utilities to enhance the resilience of the electric infrastructure against disruptive events such as extreme weather and cyber attacks
- Establish a **\$2.5 billion** Transmission Facilitation Program for DOE
- Back a **\$3 billion** expansion of the Smart Grid Investment Matching Grant Program

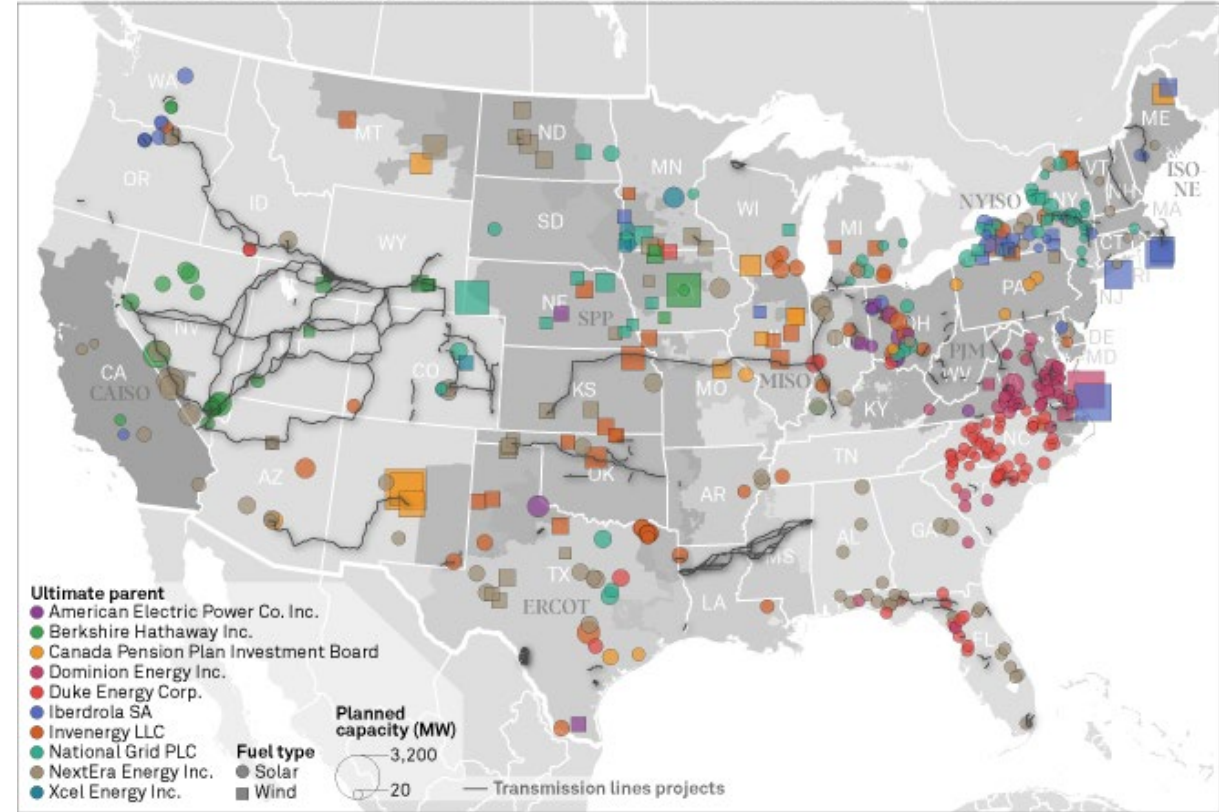
Maintaining our existing clean generation fleet

- Allocate **\$6 billion** for the Civilian Nuclear Credit program to prevent premature retirement of existing zero-carbon nuclear plants
- Invest more than **\$700 million** in existing hydropower facilities

Connectivity: Upgrading the Grid

- As renewables deployment expands, so too do the risks of curtailment and the need for additional transmission capability
- IRA set aside **\$5 billion for direct loans** for the construction, modification or repowering of generation and transmission facilities. An additional \$760 million was allocated for siting, permitting and regulatory status determinations of high-voltage interstate electricity transmission lines proposed for construction.

Planned transmission projects and renewable projects – notable owners



As of Sept. 5, 2022.

Does not include seven recently announced transmission projects not yet mapped.

Wind and solar projects include planned capacities of at least 20 MW.

Includes wind and solar projects tagged to companies as owner, developer, interconnected utility and/or primary power purchase agreement counterparty.

Map credit: Ciaralou Agpalo Palicpic

Source: S&P Commodity Insights



Manufacturing an Energy Revolution



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IRA Boosts American Manufacturing

- IRA represents first full-scale effort to orient U.S. economy toward industrial clean energy policy
- Incentives promoting clean energy manufacturing:
 - Advanced energy manufacturing credit (45X) provides *per unit* tax credits for making solar, wind, battery components, inverters, and critical minerals
 - \$10 billion in tax credits to build or retrofit facilities that produce clean energy products
 - \$2 billion for DOE grants to retrofit automaking facilities
- **\$500 million** for Defense Production Act to boost domestic manufacturing of heat pumps and critical minerals
- Over **\$160 billion** in announced private & public sector manufacturing investments into solar; electric vehicle assembly, components, & chargers; battery; & offshore wind manufacturing

Batteries

Over \$100 billion announced so far

Over 200 new or expanded minerals, materials processing and manufacturing facilities

Announced battery cell factories could supply 10 million new electric vehicles each year

Over 75,000 potential new jobs



Investment Announced Under Biden Administration

TECHNOLOGY

- Batteries
- Electric Vehicles
- Offshore Wind
- Solar

BY REPORTED AMOUNT (\$USD)

- Not Specified
- Less than 10M
- 10M - 100M
- 100M - 1B
- Over 1 Billion

BY REPORTED JOBS (#)

- Unreported
- Less than 100
- 100 - 1000
- Over 1000

PRODUCT

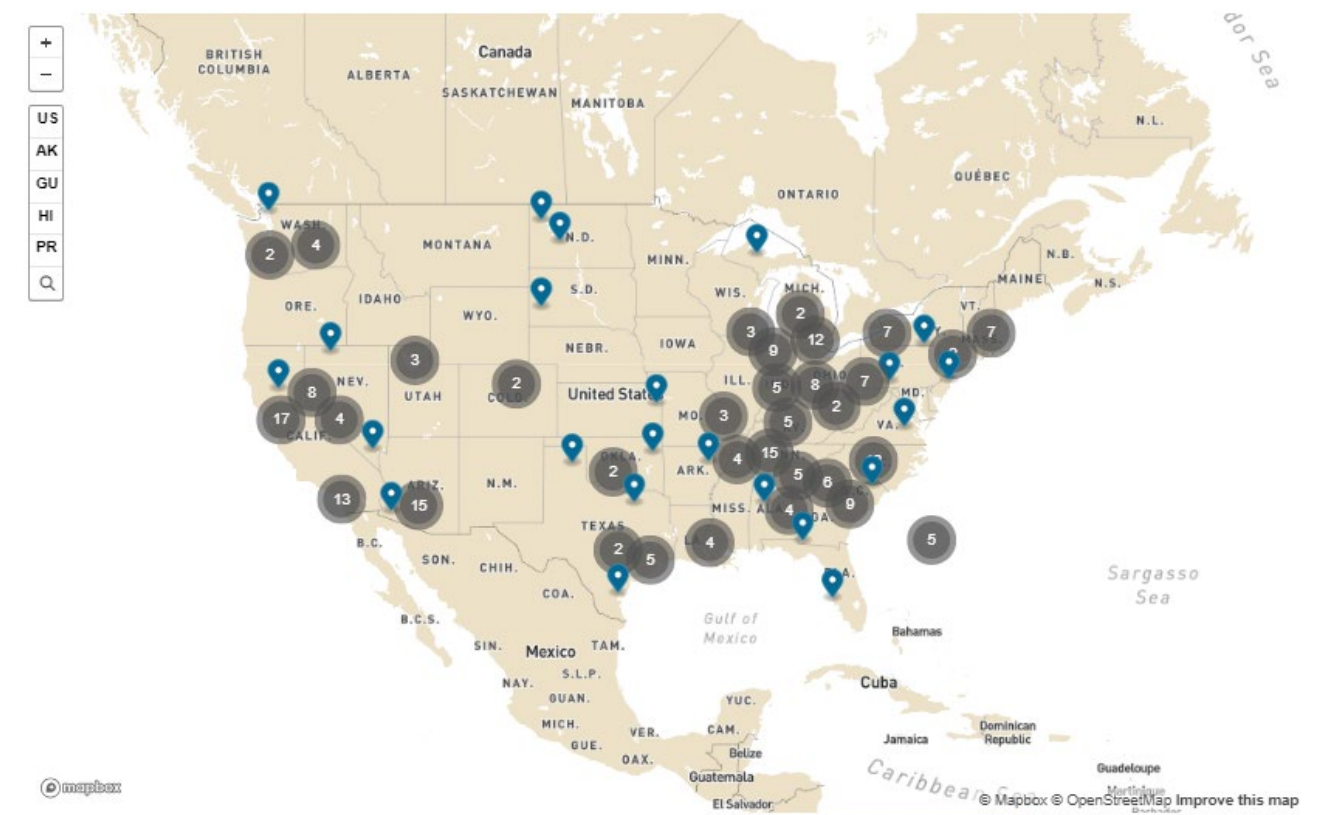
All

TIMELINE

All

STATE

All

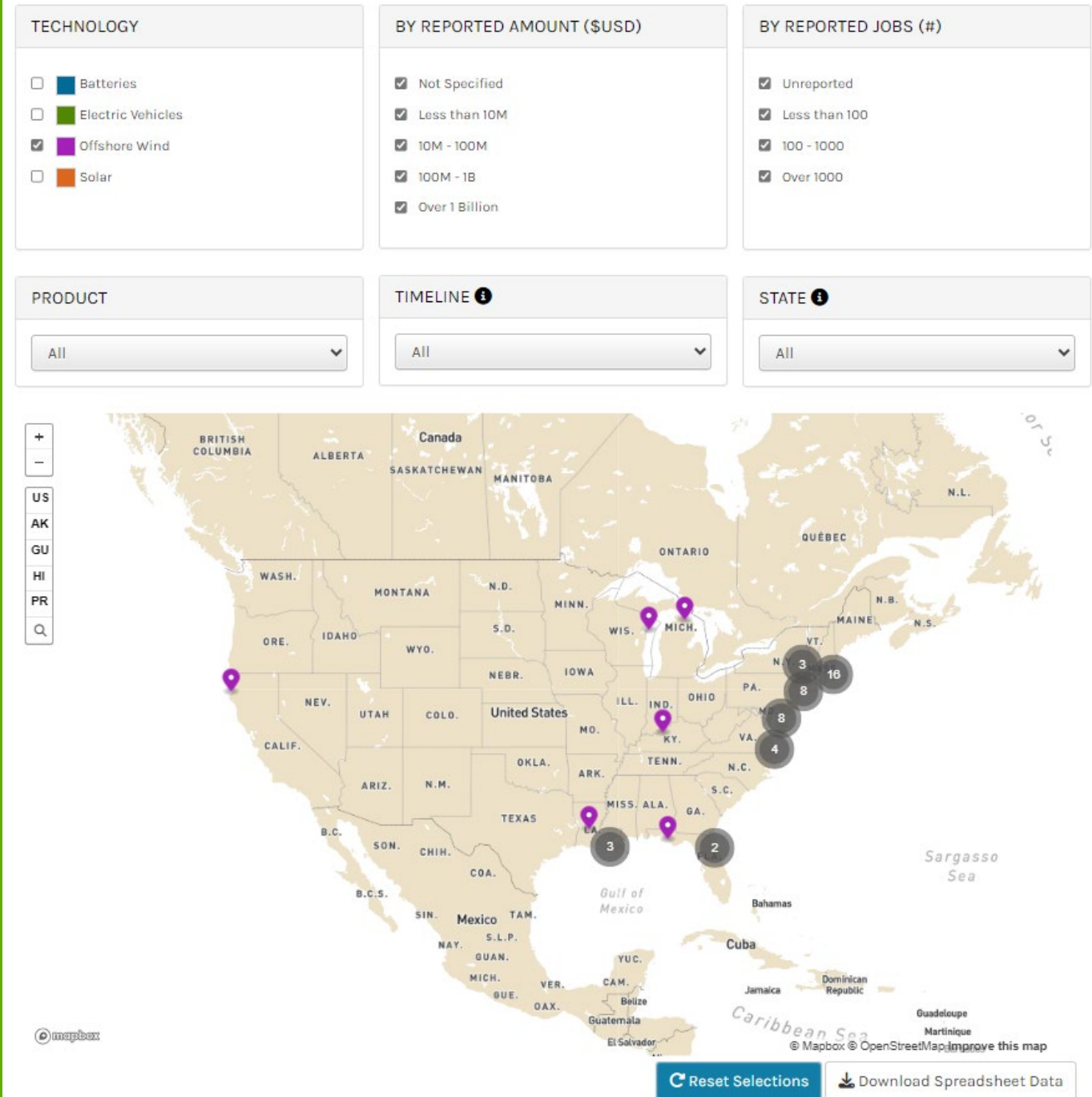


Reset Selections | Download Spreadsheet Data

Offshore Wind

- **Nearly \$3.5 billion** announced in port manufacturing and port investments so far
- Investments in **13** manufacturing facilities (8 states) and **13** ports (8 states)
- **20** new vessels being built in 8 different states
- **Thousands** of potential new jobs

Investment Announced Under Biden Administration



Solar

Nearly **\$13 billion** planned investment announced so far

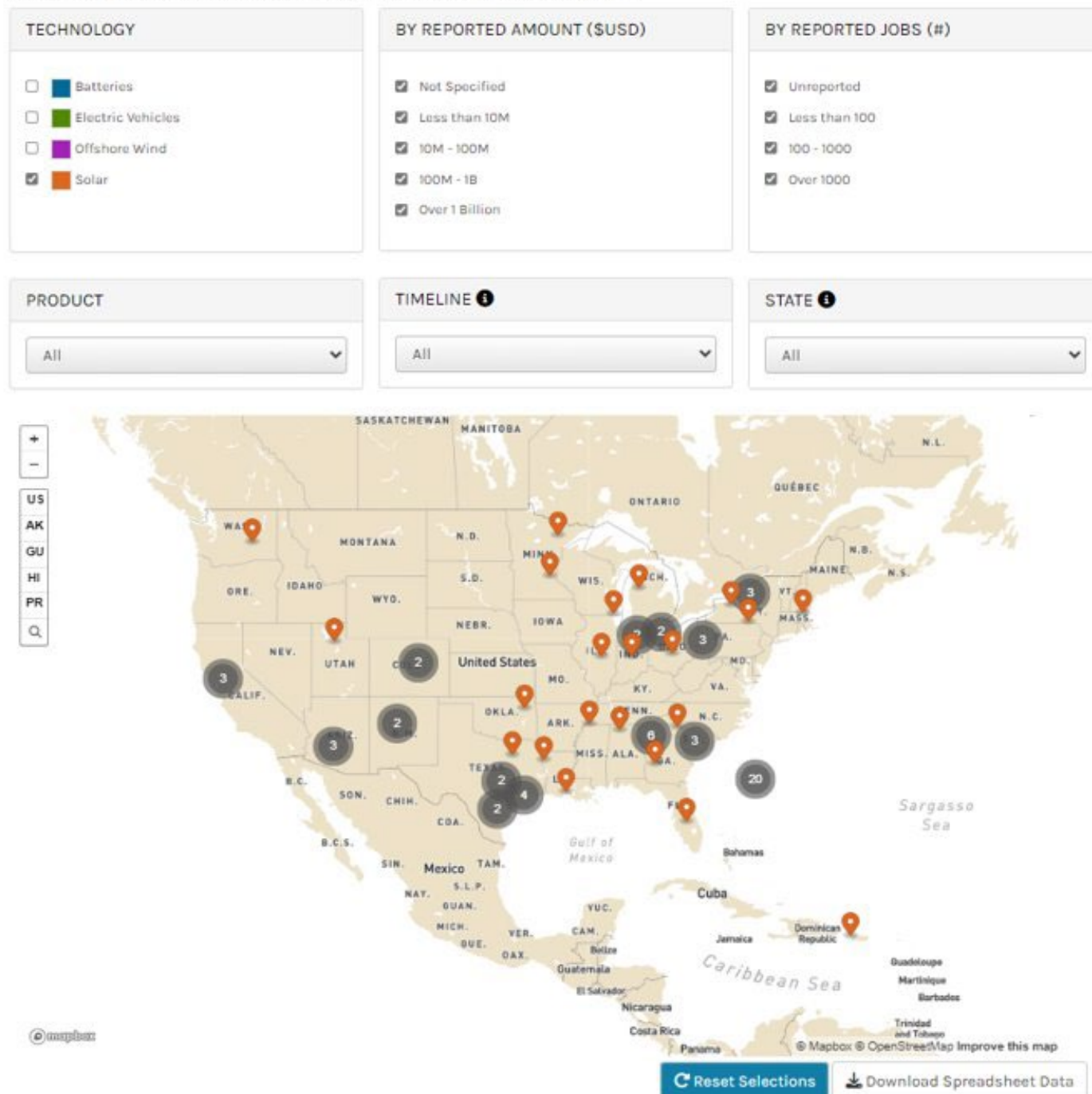
88 new and expanded manufacturing plants announced

Companies have announced enough solar panel manufacturing capacity to power **16 million** additional homes each year

Over 25,000 potential new jobs



Investment Announced Under Biden Administration



Resources



[Energy.gov/save](https://energy.gov/save)



[Energy.gov/infrastructure](https://energy.gov/infrastructure)



[Energy.gov/invest](https://energy.gov/invest)



whitehouse.gov/clean-energy/clean-energy-tax-provisions/