

YEAR IN STORIES

Eliminating carbon emissions on a net basis is poised to create the most significant reallocation of capital in history and requires record levels of investment in clean energy infrastructure to transform energy production, delivery, consumption, and efficiency. Boosted by the Inflation Reduction Act, the energy transition in North America is gaining momentum.

# HOW QUANTA'S ROLE IN THE NORTH AMERICAN ENERGY TRANSITION IS

# GAINING MOMENTUM



Although many governments and companies have committed to ambitious climate action and the imperative to address climate change is being increasingly recognized, it should not be surprising that more must be done to transition to a carbon-neutral economy. Achieving global decarbonization by 2050 entails nothing short of a fundamental transformation of the global economy.

Central to mitigating climate change risk is a transformation of the energy sector, which contributes to around 90% of total greenhouse gas (GHG) emissions.<sup>1</sup> According to industry estimates, the United States will need to add thousands of gigawatts of clean energy to the electric grid by 2035 to meet its decarbonization goals, potentially requiring hundreds of billions of dollars in additional capital for generation, transmission, and distribution.<sup>2</sup>

**QUANTA'S ROLE**

By supporting our customers across all industries in which we operate and always putting safety first, we are enabling and accelerating this transformative transition while growing our positive impact on the world. Diversified across technology and geography in North America and Australia, Quanta operating companies provide front-end engineering, procurement, project management, and construction services to all energy transition sectors, including wind, solar, energy storage, transmission, distribution, and EV charging.

Quanta operating companies are responsible for the construction of a **quarter of all the utility-scale renewable capacity** installed in the U.S.

<sup>1</sup> epa.gov/ghgemissions/sources-greenhouse-gas-emissions

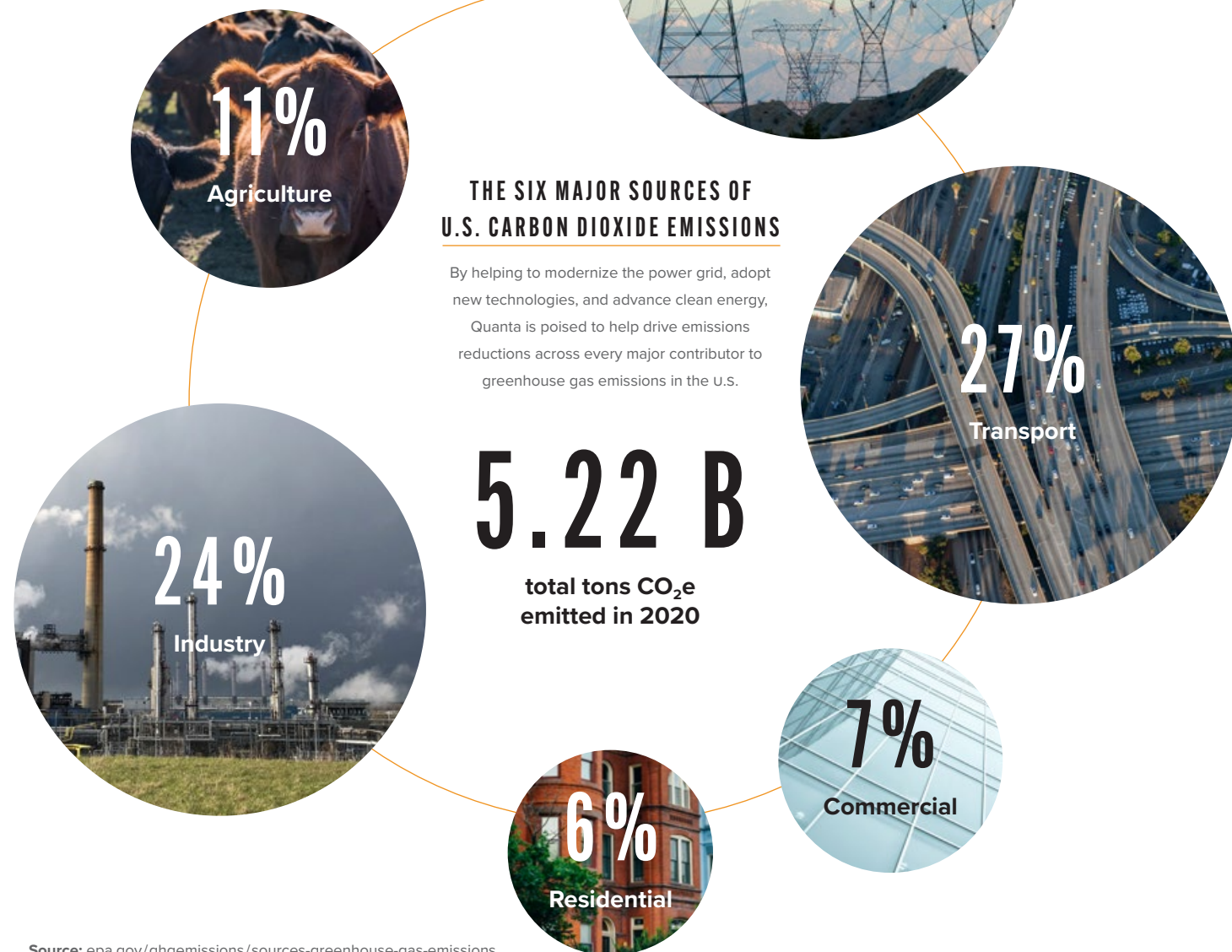
<sup>2</sup> mckinsey.com/capabilities/sustainability/our-insights/toward-a-more-orderly-us-energy-transition-six-key-action-areas



Modernizing the power grid will be crucial to ensure that areas with high potential for renewable generation integrate and connect with demand centers. It is estimated that the U.S. will need to add about twice as much transmission as it has today to fully decarbonize by 2050.<sup>3</sup> Developing new flexibility solutions, such as batteries, and integrating them with more conventional assets will be vital to ensuring a balanced energy system. Transportation will also need to decarbonize, requiring roughly \$90 billion in infrastructure investments in the U.S. by 2030.<sup>4</sup>

These changes are expected to continue to create significant opportunities for Quanta. By providing critical infrastructure solutions for our customers, we are playing a pivotal role in helping to accelerate this transition while focusing on employee safety and conducting our business socially, economically, and environmentally responsibly.

<sup>3</sup> esig.energy/wp-content/uploads/2021/02/Transmission-Planning-White-Paper.pdf  
<sup>4</sup> utilitydive.com/news/us-reaches-140k-public-ev-charging-ports-as-key-federal-official-says-90b/638821/



Source: epa.gov/ghgemissions/sources-greenhouse-gas-emissions

# IN FOCUS

## INFLATION REDUCTION ACT OF 2022: RESHAPING THE U.S. ENERGY LANDSCAPE

The Inflation Reduction Act of 2022 (IRA) was signed into law in August 2022 and represents an investment of up to \$369 billion in energy and climate spending over the next 10 years.

The IRA has the potential to dramatically transform the U.S. energy industry by lowering the costs of carbon-free technologies, accelerating decarbonization, and shaping domestic industrial policy.

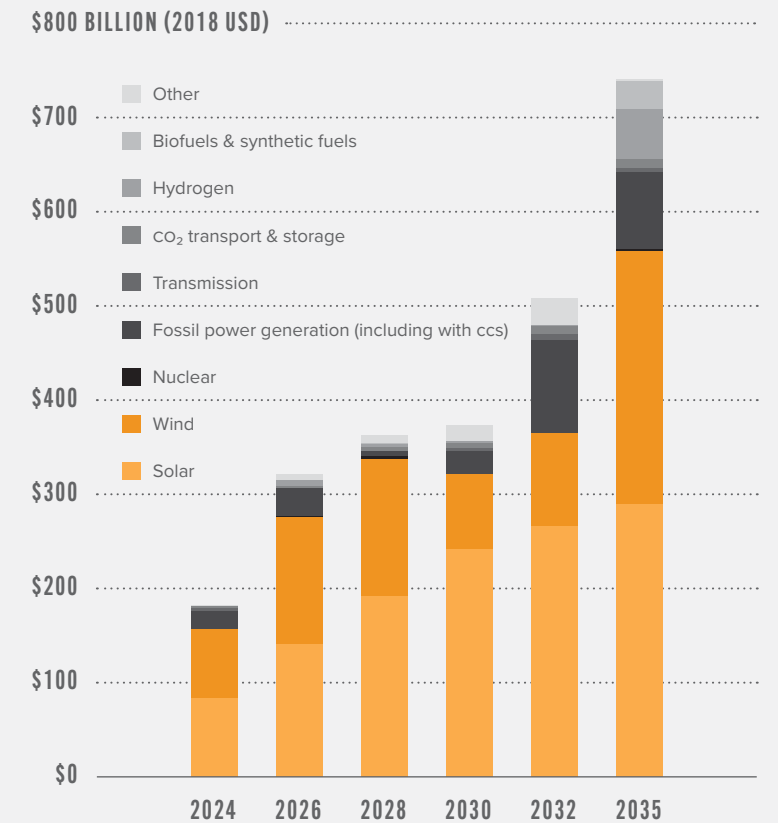
The IRA is designed to provide incentives and investments across the entire energy supply chain—for existing technologies (e.g., new wind, solar, and storage and existing nuclear) and more nascent technologies, such as hydrogen and carbon capture and storage (CCS).

To ensure long-term energy security and economic growth, the IRA links numerous provisions, incentives, and bonus credits to domestic content and prevailing wage and apprenticeship requirements. In addition, the law emphasizes building domestic supply chains for solar, wind, battery storage, and electric vehicles.

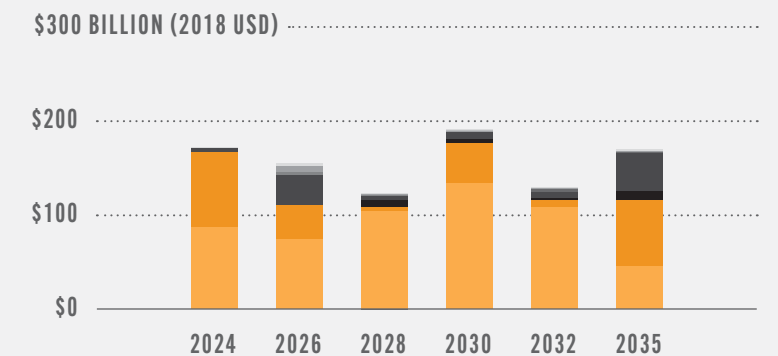
The massive scope and scale of the IRA has the potential to fundamentally change the U.S. energy industry. At a basic level, technological and economic shifts can boost emerging decarbonization options such as decarbonized gas infrastructure—hydrogen, renewable natural gas, carbon capture and sequestration, and related pipeline build opportunities.

## ESTIMATED ANNUAL CAPITAL INVESTMENT IN ENERGY SUPPLY-RELATED INFRASTRUCTURE

### CAPACITY INVESTMENT WITH THE IRA



### CAPACITY INVESTMENT WITHOUT THE IRA



Source: repeatproject.org/docs/REPEAT\_IRA\_Preliminary\_Report\_2022-08-04.pdf



### Growth in Wind & Solar Set to Continue

The IRA's clean energy investments, if achieved, aim to at least double the rate of renewable installations by 2030. In the U.S., renewables provided almost 70% of all new capacity in 2022, and solar power is expected to account for more than half the expected new generating capacity.<sup>5</sup> Notably, most developers are now expected to pair solar facilities with one- to four-hour lithium-ion battery storage systems. If the current wind and utility-scale solar pipeline projects come online by the end of 2026, renewable generation is projected to double 2021's total. In addition, the IRA is designed to provide the industry with some additional certainty by extending tax credits for wind and solar over the next 10 years and allows developers to gain investment tax credits for standalone energy and wind-plus storage projects for the first time.<sup>6</sup>

<sup>5</sup> renewablesnow.com/news/solar-and-wind-each-added-more-capacity-in-us-than-natural-gas-in-9-mo-2022-803930/

<sup>6</sup> whitehouse.gov/wp-content/uploads/2022/12/Inflation-Reduction-Act-Guidebook.pdf

#### QUANTA'S IMPACT

➔ **4.5 GW**

utility-scale wind and solar capacity installed by Quanta in 2022

➔ **8.3 MT**

(million tons) approximate CO<sub>2</sub>e avoided by Quanta's 2022 wind and solar installations\*

➔ **60 GW**

cumulative total approximate utility-scale renewable capacity installed by Blattner, over a quarter of the total 227 GW in the U.S.

➔ **7.5 GW**

utility-scale wind and solar projects developed from front-end services work in 2022

\*See "Sustainability Data Metrics" on page 126 for calculation methodology, assumptions, and estimates.



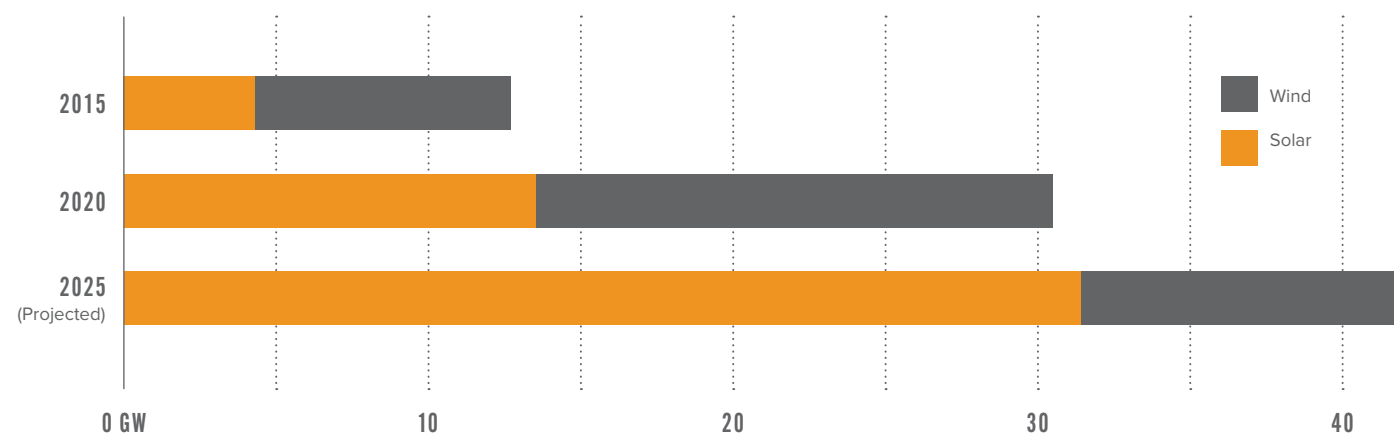
### BUILDING THE LARGEST RENEWABLE ENERGY INFRASTRUCTURE PROJECT IN U.S. HISTORY

In 2023, Quanta operating companies were awarded the construction of SunZia Southwest Transmission Project, a 550-mile, ±525 kV high-voltage direct current (HVDC) transmission line located across federal, state, and private lands between central New Mexico and south-central Arizona, with the capacity to transport 3,000 MW of renewable energy.<sup>8</sup> The SunZia Transmission line will be the conduit for the largest wind project in U.S. history, a 3,500+ MW SunZia Wind facility in New Mexico. Combined, the SunZia wind and transmission projects represent the largest clean energy infrastructure project in U.S. history, enough to power the needs of more than 3 million Americans. In addition, the project stands to deliver widespread economic benefits across New Mexico and Arizona, with an estimated investment of over \$8 billion, with significant amounts going to governments, communities, schools, and landowners across New Mexico and Arizona.



<sup>8</sup> investors.quantaservices.com/news-events/press-releases/detail/338

### ANNUAL U.S. UTILITY ONSHORE WIND & SOLAR CAPACITY ADDITIONS



Source: about.bnef.com

### Transmission & Distribution: Renewable Energy Drives Growth

Interconnecting renewables, replacing aging infrastructure, resilience investments, and load growth in growing regions are driving investments in transmission and distribution (T&D). Transmission and distribution investment in North America has been growing steadily for at least a decade and is poised for another round of measurable growth driven by renewable energy capacity needs.<sup>7</sup> Key drivers include replacements and upgrades of aging T&D facilities for safety, reliability, and resilience and to incorporate new and improved technologies.

<sup>7</sup> nrel.gov/docs/fy23osti/84327.pdf



### Battery Storage: Growth Takes Off

A large amount of existing and planned solar and wind capacity in California and Texas represents a growing need for battery storage as a means of firming renewables and paving the way for a cleaner grid. Battery storage projects should be significantly boosted by the IRA, with standalone projects now eligible for tax incentives.<sup>9</sup> The American Clean Power Association expects annual battery storage capacity additions to top 10 GW by 2023 and to continue at that level through 2026.<sup>10</sup> Developers are building even larger battery storage projects as more capacity becomes available in the U.S. For example, more than 23 large-scale battery projects, ranging from 250 MW to 650 MW, are scheduled to be deployed by 2025.<sup>11</sup>

Demand for domestically manufactured batteries is expected to increase further due to the domestic content required to fully maximize the energy storage investment tax credit available under the IRA. In 2022, Quanta invested and partnered alongside energy innovator KORE Power, a leading U.S.-based developer of lithium-ion battery cells and manufacturer of integrated solutions for the e-mobility and energy storage sectors. This strategic alliance with KORE Power aims to enhance Quanta's ability to deliver comprehensive energy solutions in partnership with our customers.<sup>12</sup>

<sup>9</sup> [whitehouse.gov/wp-content/uploads/2022/12/Inflation-Reduction-Act-Guidebook.pdf](https://www.whitehouse.gov/wp-content/uploads/2022/12/Inflation-Reduction-Act-Guidebook.pdf)

<sup>10</sup> [cleanpower.org/resources/u-s-energy-storage-monitor/](https://www.cleanpower.org/resources/u-s-energy-storage-monitor/)

<sup>11</sup> [eia.gov/todayinenergy/detail.php?id=54939](https://www.eia.gov/todayinenergy/detail.php?id=54939)

<sup>12</sup> [bloomberg.com/press-releases/2022-11-30/kore-power-announces-75m-first-close-of-150m-investment-round-with-siemens-as-lead-investor-and-joined-by-quanta-services](https://www.bloomberg.com/press-releases/2022-11-30/kore-power-announces-75m-first-close-of-150m-investment-round-with-siemens-as-lead-investor-and-joined-by-quanta-services)

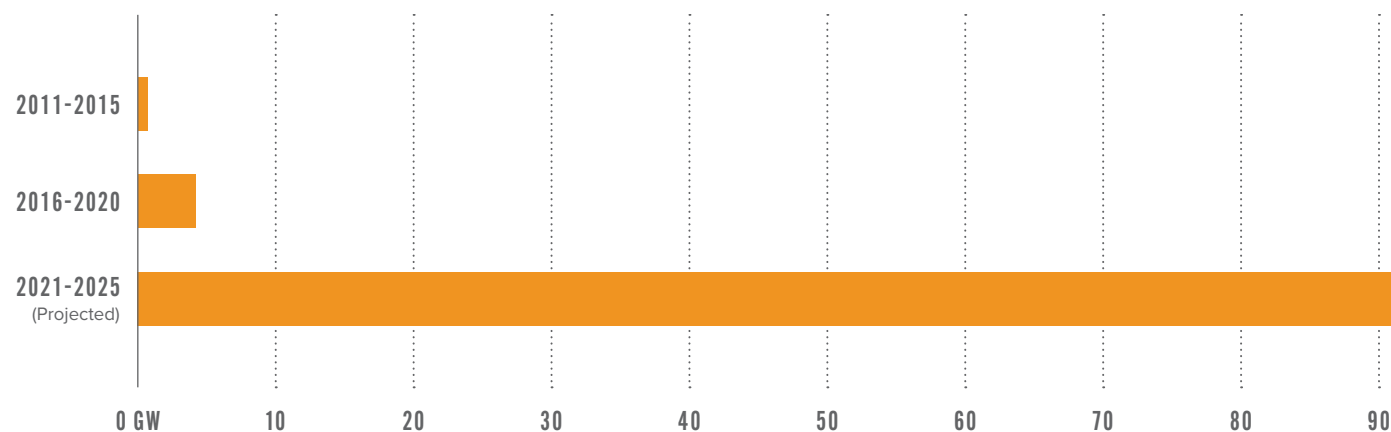


### BUILDING THE SOUTHERN HEMISPHERE'S LARGEST BATTERY PROJECT

A Quanta operating company in Australia is part of a winning consortium to develop and construct the Waratah Super Battery. Located north of Sydney, Australia, and built at the site of an old coal-fired power station, the 1.5 million square foot battery energy storage system (BESS) is expected to be the largest committed battery project in the southern hemisphere and the most powerful battery in the world. The company was selected as the engineering, procurement, and construction (EPC) company responsible for all site works, BESS installation, and electrical works, including high voltage connection. The Waratah Super Battery project can provide a continuous active power capacity of at least 700 MW and a usable energy storage capacity of at least 1,400 MWh.



### U.S. BATTERY STORAGE MAXIMUM POWER CAPACITY BY YEAR



Source: [eia.gov/todayinenergy/detail.php?id=54939](https://www.eia.gov/todayinenergy/detail.php?id=54939)

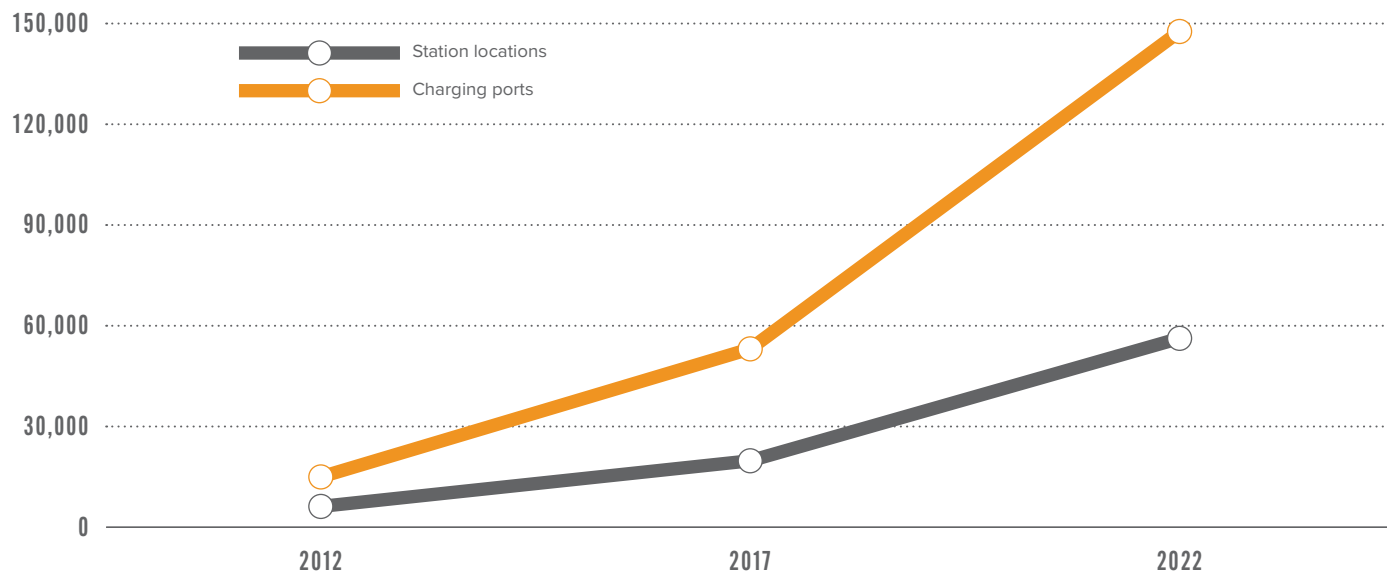
### QUANTA'S IMPACT

1,354 MWh<sub>AC</sub>  
utility-scale energy storage capacity installed in 2022

700 MW  
continuous active power capacity created by the Waratah Super Battery



TOTAL PUBLIC & PRIVATE ELECTRIC CHARGING STATIONS & PORTS IN THE U.S.



Source: [afdc.energy.gov/fuels/electricity\\_locations.html](https://afdc.energy.gov/fuels/electricity_locations.html)

EV Charging: Capacity Set to Quadruple

If federal zero-emission vehicle sales targets are met, the U.S. could have more than 48 million electric vehicles (EV) on the road by 2030.<sup>13</sup> The U.S. has now crossed 6% in total EV market share, working toward its goal of a 50% share by 2030. Although the number of charging stations across the country more than doubled between 2015 and 2020, the number needs to quadruple again to meet the goal of 500,000 chargers by 2030.

Currently, there are 47,300 Level 2 and 7,600 DC fast charging stations in the U.S. and Canada.<sup>14</sup> The IRA provides \$7.5 billion for a national network of EV charging, including construction, upgrades, and five years of operating and maintenance costs, with the goal of installing 500,000 chargers by 2030.<sup>15</sup> Electricity demand will grow with increased EV ownership and charging stations, highlighting the need for reliable supply. McKinsey estimates that if EV ownership meets the federal 2030 uptake goal, annual demand for electricity to charge them will surge from 11 billion kilowatt-hours (kWh) currently to 230 billion kWh in 2030.<sup>13</sup>

<sup>13</sup> [mckinsey.com/industries/public-and-social-sector/our-insights/building-the-electric-vehicle-charging-infrastructure-america-needs](https://www.mckinsey.com/industries/public-and-social-sector/our-insights/building-the-electric-vehicle-charging-infrastructure-america-needs)

<sup>14</sup> [afdc.energy.gov/fuels/electricity\\_locations.html](https://afdc.energy.gov/fuels/electricity_locations.html)

<sup>15</sup> [whitehouse.gov/briefing-room/statements-releases/2022/06/09/fact-sheet-biden-harris-administration-proposes-new-standards-for-national-electric-vehicle-charging-network/](https://www.whitehouse.gov/briefing-room/statements-releases/2022/06/09/fact-sheet-biden-harris-administration-proposes-new-standards-for-national-electric-vehicle-charging-network/)

NAVISTAR PARTNERS WITH QUANTA FOR EV CHARGING INFRASTRUCTURE

Recently Navistar announced a newly formed partnership with Quanta for the engineering, construction, and support of power assessment for charging infrastructure evaluation, providing ease of use for EV customers. In partnership with Quanta, Navistar will provide International Truck and IC Bus customers with a comprehensive vehicle and charging infrastructure solution that is designed to enable fleets to implement battery-electric vehicles quickly and efficiently.

“Our electric vehicles are only as strong as the grid that powers them,” said Mathias Carlbam, President and CEO, Navistar. “The differentiator of this partnership is Quanta’s ability to complete site construction and utility work. This allows our team to offer the customer a one-stop-shop approach to all aspects of an EV transition.”

IN FOCUS



Photo courtesy of EYgo

QUANTA’S CAPABILITIES: BUILDING EV CHARGING INFRASTRUCTURE

With rapid EV adoption on the horizon in North America, a significant scale-up in supporting infrastructure is needed to create a national EV charging network that is convenient and reliable for drivers across all vehicle types. Quanta provides site assessment, engineering, and project management services to business and commercial fleet owners, automakers, and EV charging companies.

As technologies in vehicle electrification continue to mature, Quanta operating companies can integrate engineering, procurement, project management, utility coordination, and construction to offer complete turnkey EV infrastructure capabilities for chargepoint operators and fleet owners. Work includes sizing of charger requirements as well as an assessment of electric infrastructure. Quanta’s EV infrastructure experience consists of both Level 2 chargers and Level 3 DC fast chargers and all of the associated electrical infrastructure, including transformers, switchboards, and panels.