U.S. Electric Vehicle Manufacturing Investments and Jobs

Characterizing the Impacts of the Inflation Reduction Act after 18 Months

March 2024

Environmental Defense Fund

wsp

This report summarizes the significant private investments in the electric vehicle (EV) ecosystem that have been announced over the past 9 years. This includes announced investments in manufacturing EVs, EV components, EV batteries, EV battery components, and EV battery recycling. This is the third iteration of this report with earlier versions of the report issued in March and August of 2023.

Key Takeaways – March 2024

- **Investment**. Over the last 9 years, manufacturers have announced $188 billion in concrete investment in U.S. EV and EV battery manufacturing facilities. Federal policies have dramatically expanded and accelerated these investments: 61 percent of announced EV investments have occurred in the last 18 months since passage of the Inflation Reduction Act (IRA) and 82 percent have occurred in the last 27 months since passage of the Bipartisan Infrastructure Law (BIL).

- **Jobs**. Supported by these investments, over the last 9 years, manufacturers have announced 194,500 created and retained U.S. EV-related jobs. Federal investments and incentives that are specifically designed to onshore the EV manufacturing supply chain have likewise substantially expanded and accelerated new job announcements. Of all the EV jobs announced since 2015, 51 percent are represented by announcements occurring in the last 18 months (since the passage of the IRA) and 74 percent are represented by announcements occurring in the last 27 months since the passage of the BIL. Announced EV and battery manufacturing could also generate up to 876,000 additional jobs in indirect/secondary employment.

- **States**. 10 states account for 84 percent of announced EV manufacturing investments. Georgia has over $31 billion in investment supporting 38,700 jobs. Michigan and North Carolina have seen over $20 billion and $19 billion in investment, respectively, supporting 32,000 created and retained jobs in both states combined.

- **Production Capacity.** In 2027, U.S. EV manufacturing facilities will be capable of producing approximately 5.5 million new electric vehicles annually (which represents 35 percent of new passenger cars, light duty trucks and SUVs sold in the U.S. 2023). In 2027, U.S. battery manufacturing facilities will be capable of producing 1,099 Gigawatt hours (GWh) of EV batteries, sufficient to supply 12.3 million new electric vehicles each year.

- **Continuing Growth.** U.S. investments, jobs, and production capacity will likely continue to grow in response to strong federal investments and incentives. Global EV and battery manufacturers have announced aggressive and sustained investment needs worldwide to support the EV transition over the next decade. While many have not yet specified where those investments will occur, current investment data demonstrates that the IRA has made the U.S. a highly attractive market for EV ecosphere manufacturing facilities.

- **Additional Policies.** Each new investment announcement represents an opportunity to set a strong standard for what high-quality, community-sustaining jobs in the clean economy can look like. Policymakers and granting agency staff should work with employers, labor, and community-based organizations to maximize the benefits of onshoring the EV manufacturing supply chain for the workers who comprise it, and for the communities where new investments are being made.

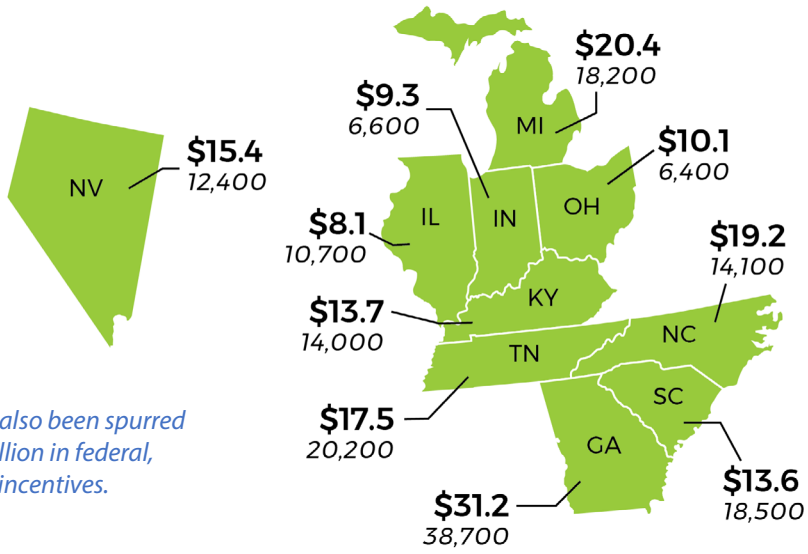
Announced EV, EV Battery, Battery Component, and Battery Recycling Investment & Employment

January 2015 - February 2024

Manufacturing	Investment	Announced Created/Retained Jobs
Passenger vehicles	$39.9 billion	62,700
Medium heavy duty vehicles	$13.8 billion	24,000
EV components	$4.0 billion	9,600
EV batteries	$99.7 billion	81,100
EV battery components	$24.0 billion	15,000
EV battery recycling	$6.4 billion	2,200
Total	**$188 billion**	**194,500**

84% of Announced Investment is in 10 States

$ Billions of Investment
Number of new jobs

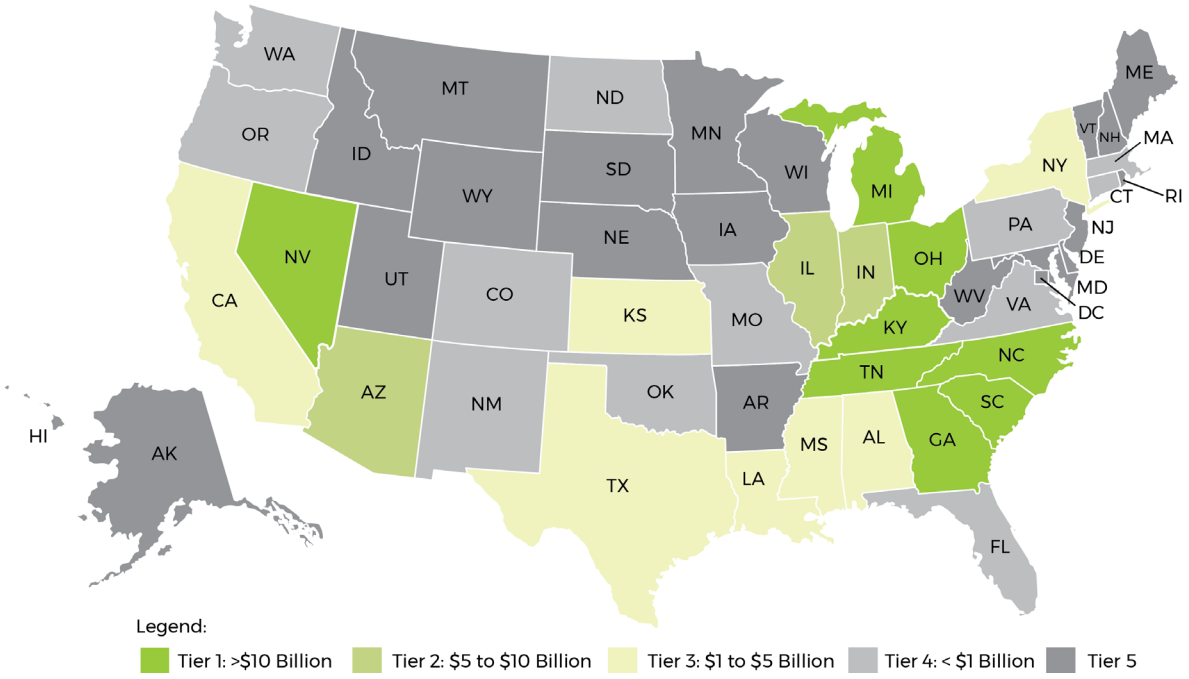


Investment has also been spurred by nearly $27 billion in federal, state, and local incentives.

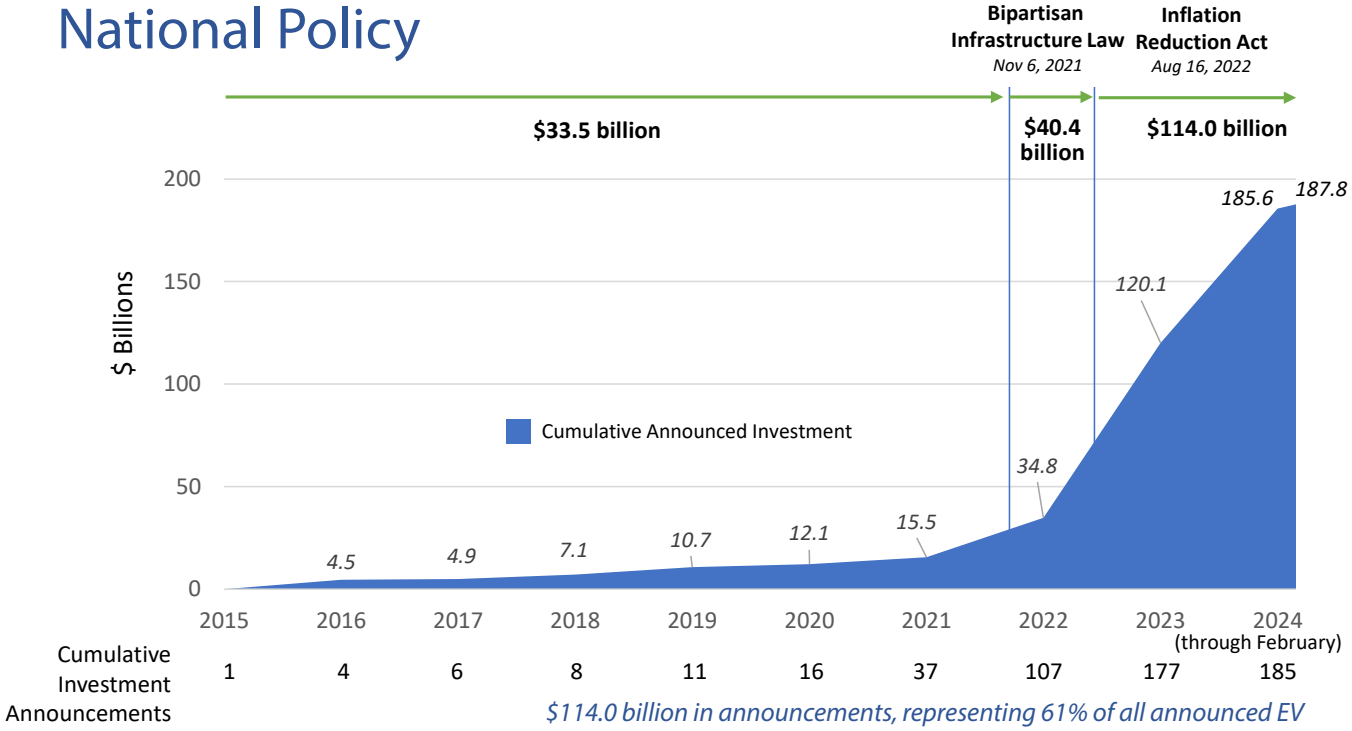
State	Total Announced Investment *($ billions)*
Georgia	$31.2
Michigan	$20.4
North Carolina	$19.2
Tennessee	$17.5
Nevada	$15.4
Kentucky	$13.7
South Carolina	$13.6
Ohio	$10.1
Indiana	$9.3
Illinois	$8.1
Other	$29.4
Total	**$188**

Announced EV Ecosystem Investment

- 185 distinct manufacturing investments announced at 162 project sites in the past 9 years
- $188 billion in private investment announced
- These investments will result in 195,000 created or retained jobs, and could generate up to 876,000 addition jobs in secondary employment[1]



EV Investment is Spurred by National Policy



$114.0 billion in announcements, representing 61% of all announced EV investments, have occurred in the 18 months since the passage of the IRA.

[1]*Climate Nexus; Job Impacts from the Shift to Electric Cars and Trucks and Nevada Governor's Office of Economic Development; Economic Impact of Tesla Gigafactory on Washoe and Storey Counties*

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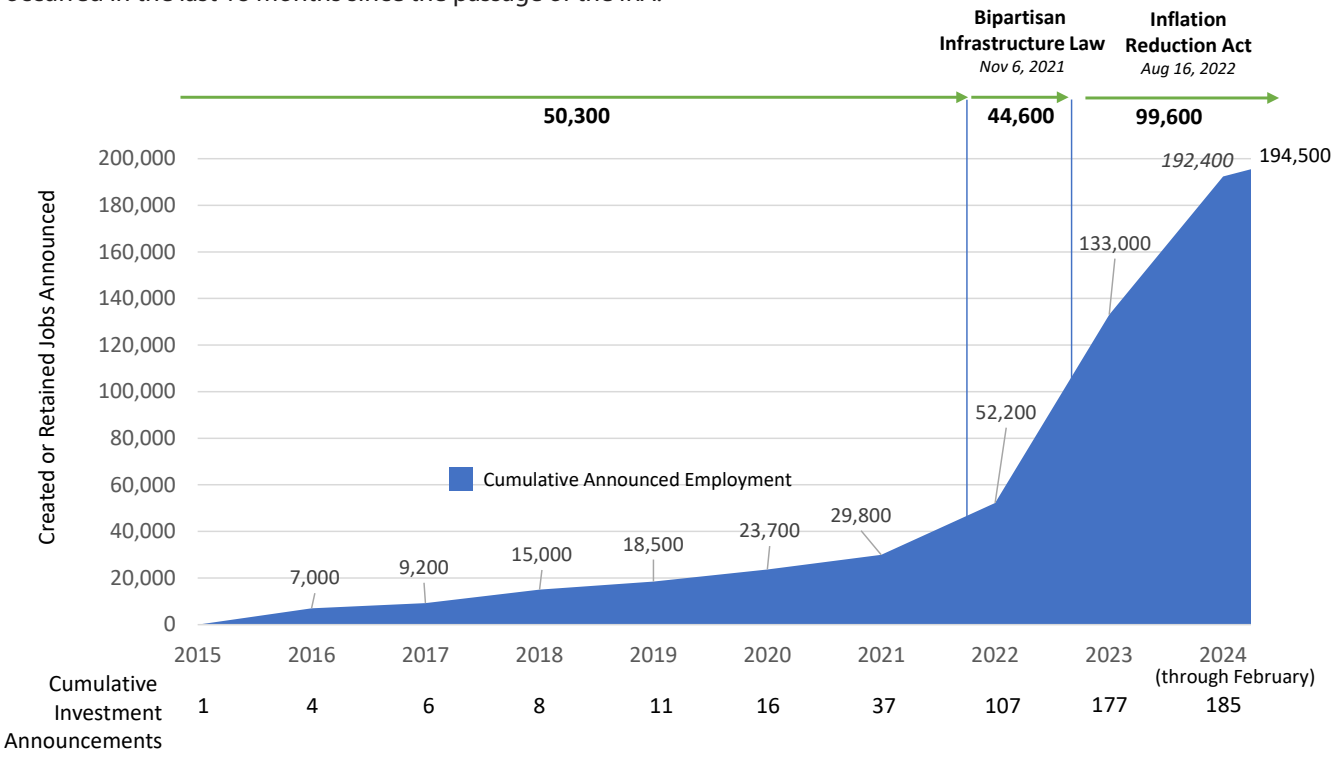
New EV Job Announcements Accelerated by National Policy

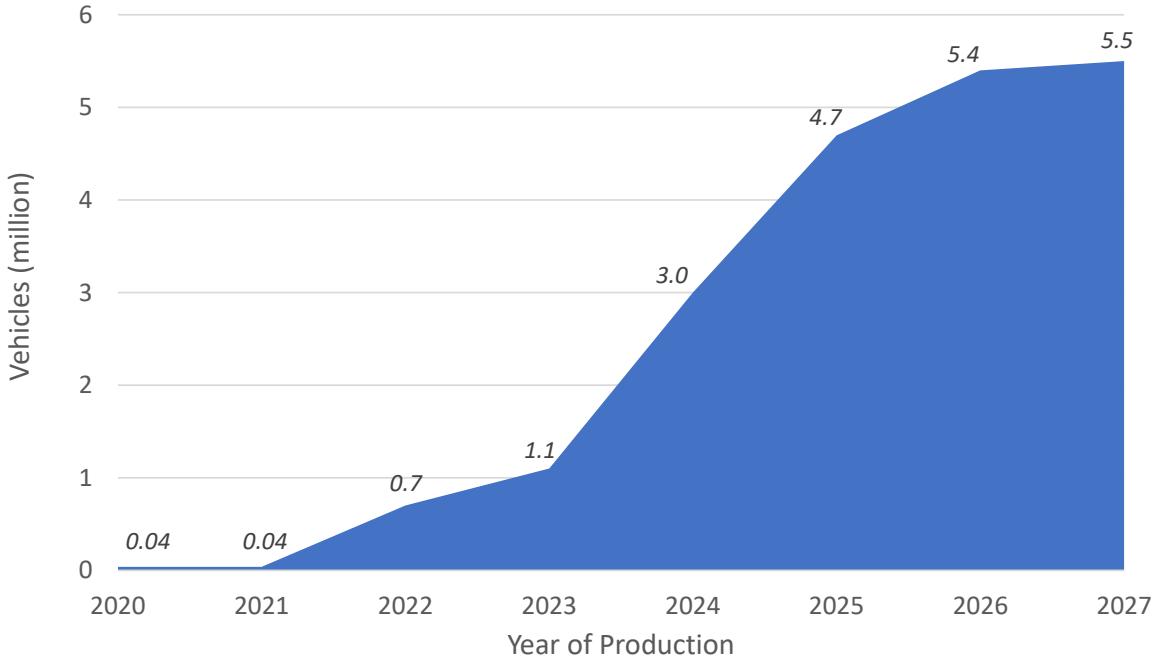
99,600 announced created/retained jobs, representing approximately 51% of all EV job announcements, have occurred in the last 18 months since the passage of the IRA.



State	Announced Created/Retained Jobs
Georgia	38,700
Tennessee	20,200
South Carolina	18,500
Michigan	18,200
North Carolina	14,100
Kentucky	14,000
Nevada	12,400
Illinois	10,700
Arizona	9,700
Indiana	6,600
Other	31,400
Total	**194,500**

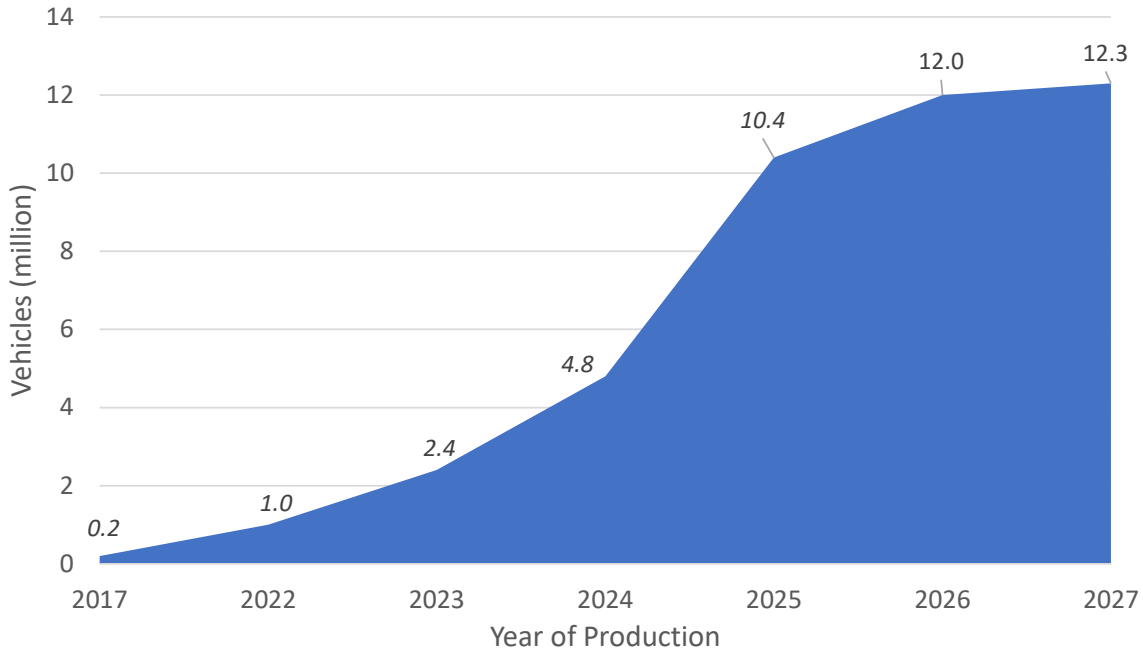
Total EV Manufacturing Capacity

U.S. EV manufacturing facilities will be capable of producing approximately 5.5 million new light-, medium-, and heavy-duty electric vehicles each year in 2027, which represents approximately 35 percent of all new passenger cars, light duty trucks and SUVs sold in the U.S. in 2023.



Battery Manufacturing Capacity

By 2027, U.S. battery manufacturing facilities will be capable of producing 1,099 GWh of EV battery capacity, which is enough capacity to power 12.3 million new cars, 80% of the vehicles sold in the U.S. in 2023.



Methodology

This report summarizes private investments made or announced within the past 9 years in the U.S. electric vehicle (EV) ecosphere. This includes investments in the manufacturing of EVs, EV batteries, and EV battery components. The research builds from previous work contained in the Environmental Defense Fund's (EDF's) August 2022 document, Electric Vehicle Market Update: Manufacturer Commitments & Public Policy Initiatives Supporting Electric Mobility in the U.S. & Worldwide. The research also builds off of the first two iterations of this report, which were issued in March and August of 2023.

The underlying data was collected through a review and compilation of U.S. investment announcements conducted by WSP in 2023 and 2024 as well as review clean energy investment lists other organizations have produced such as the Blue Green Alliance, the Department of Energy, and Environmental Entrepreneurs. The research team reviewed announcements released by investors, state and local governments, industry publications and local media, to capture the following data for each project:

- Company name and nationality
- Investment type (EV assembly plant – passenger cars and medium/heavy-duty vehicles, Battery manufacturing plant, Battery component plant, Battery recycling plant)
- Location (City, State)
- Announced investment value ($ billions)
- Facility production capacity (vehicles/year, Gigawatt-hours/year, tons/year)
- Announced facility employment (number of jobs when facility is at full production)
- Announcement date
- Schedule (construction begins, production begins)
- Local Incentives value ($ billions) and description
- Federal Incentives value ($ billions) and description

The research team identified a total of 185 individual investment announcements at 162 project sites. Twenty-five of these investment announcements have been added since the release of the August 2023 iteration of this report. For 21 of the projects included in the August 2023 version of this report, changes have since been announced to timelines for construction or operation, and/or announced changes (plus and minus) to investment value, capacity, or employment. This update captures these announced changes to the 21 prior projects.

The data set only includes projects with announced investment levels or jobs announced and known construction start or completion dates. If an investment was announced, but no corroborating information could be found that the project is moving forward, it was excluded from the data set. In all, the research identified 35 projects announced prior to the passage of the BIL on November 6, 2021; 26 projects announced after passage of the BIL and before adoption of the IRA, and 124 projects announced in the past 18 months since the enactment of the IRA. In addition to direct employment figures, this iteration of the U.S. EV Manufacturing Investments and Jobs analysis also includes estimates of indirect and induced employment. Indirect jobs are generated to produce the goods and services needed by workers with direct jobs. Induced jobs involve employment created by the additional personal spending of both direct and indirect workers. We have applied the following multipliers to direct employment figures to calculate induced and indirect employment:

- EV manufacturing: +7 jobs for each direct job (Climate Nexus Job Impacts from the Shift to Electric Cars and Trucks)
- EV batteries, battery components, EV component: + 2.5 jobs for each direct job (Nevada Governor's Office of Economic Development; Economic Impact of Tesla Gigafactory on Washoe and Storey Counties)

Using these multipliers indicates that the announced direct investments in the EV vehicle and battery manufacturing ecosphere could generate as many as 876,400 new induced and indirect jobs.

Not all parameters of interest were necessarily available for all projects in the dataset. The research team developed average values announced for each investment type for: investment level, employment, capacity, and construction time. In cases where certain parameters were unknown for a given project, the research team used the average values to calculate the missing information. Similarly, for projects for which production start date is unknown, the project team estimated a production start date based on the construction start date and the average construction duration for similar projects for which both construction start and production start dates are known. The total values for cumulative production and jobs by year shown in this report include these estimates. Of the $187.8 billion in total investment, 99% are announced investment levels, the remaining 1% has been calculated. Of the cumulative 194,500 EV ecosystem jobs announced between 2015 and February 29, 2024 , 87% are announced jobs, with the remainder estimated jobs. Of the 5.5 million annual EV manufacturing capacity expected online in 2027 (both passenger and medium/heavy-duty vehicles), 77% is announced capacity and the remainder is estimated capacity. Of the 16.6 million annual EV battery manufacturing capacity expected online in 2028, 89% is announced capacity and the remainder is estimated capacity.

It should be noted that the battery manufacturing capacity is reported in terms of the approximate number of light duty vehicles that the batteries could power, for consistency. Battery manufacturing capacity values were available in gigawatt-hours for most of the projects, which were converted into vehicles using a factor of 89 KWh per EV battery for a light-duty vehicle. This is the average of the values used by the U.S. Department of Energy Office of Energy Efficiency, Vehicle Technologies Office (77 – 100 kWh/EV) to estimate 2030 North American EV battery production capacity in Fact of the Week #1271, published January 2, 2023. This figure is larger than the current size of most EV batteries, so the resulting battery production figures can be considered conservative. Given the variety of measures used to quantify the production of battery component plants, this information was noted, but not included in the quantitative analysis.