

U.S. Electric Vehicle Manufacturing Investments and Jobs

Characterizing the Impacts of the Inflation
Reduction Act after 1 Year

August 2023



This report summarizes the significant investments in the electric vehicle (EV) ecosystem that have been announced over the past 8 years. This includes announced investments in manufacturing EVs, EV Components EV batteries, EV battery components, and EV Battery recycling.

Announced EV, EV Battery, Battery Component, and Battery Recycling Investment & Employment 2015 - 2023

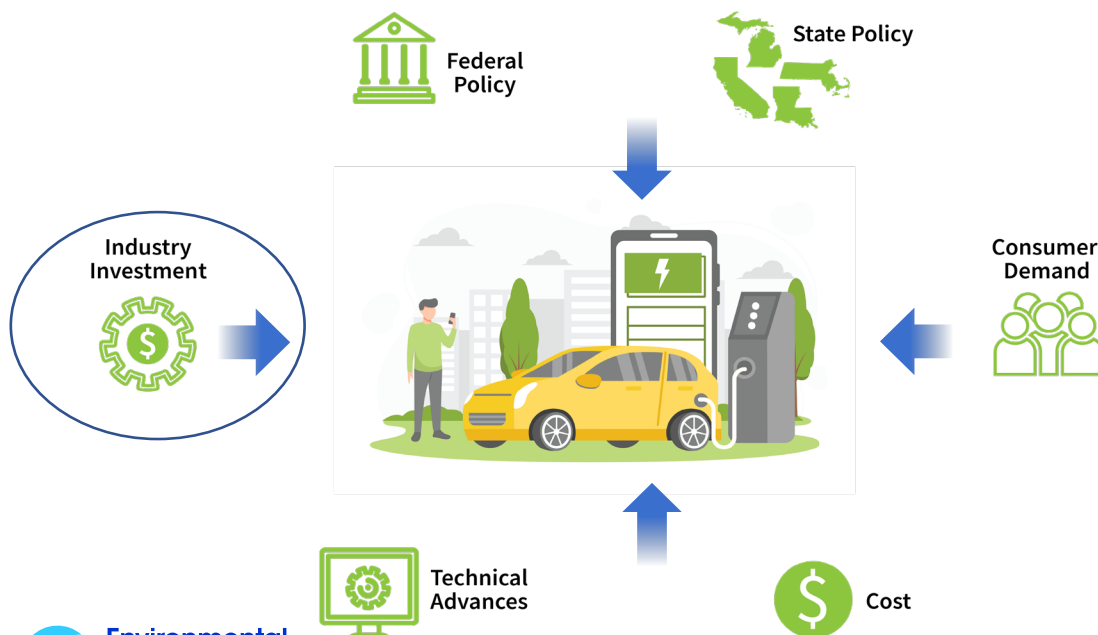
Manufacturing	Investment	Announced New Jobs*
Passenger vehicles	\$34.7 billion	57,508
Medium heavy duty vehicles	\$14.5 billion	23,247
EV Components	\$3.7 billion	8,763
EV batteries	\$88.1 billion	76,002
EV battery components	\$20.1 billion	11,568
EV battery recycling	\$4.0 billion	2,230
Total	\$165.1 billion	179,318

* Some of these new jobs already exist for facilities that are operating, others are based on company announcements and have yet to be created.

Electric Vehicle Policy Landscape

This investment has been catalyzed by recent federal legislation.

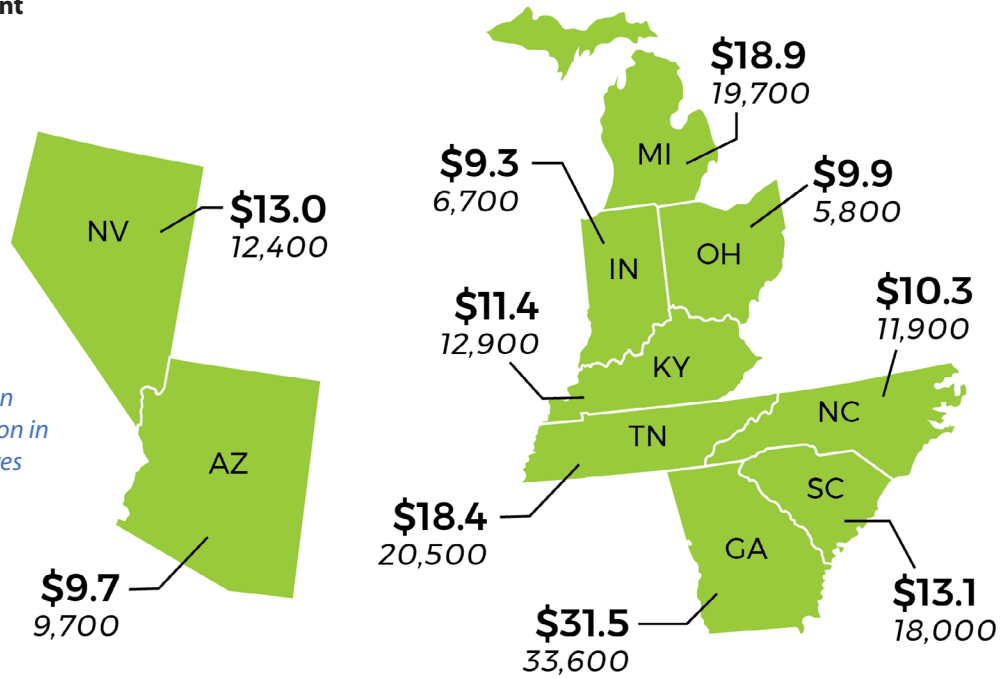
- ▶ Bipartisan Infrastructure Law (BIL) November 2021
 - ▶ Over \$100 billion in spending supporting EVs and clean energy policy
- ▶ Inflation Reduction Act (IRA) August 2022
 - ▶ \$369 billion in spending on climate and energy policy



88% of Announced Investment is in 10 States

\$ Billions of Investment
Number of new jobs

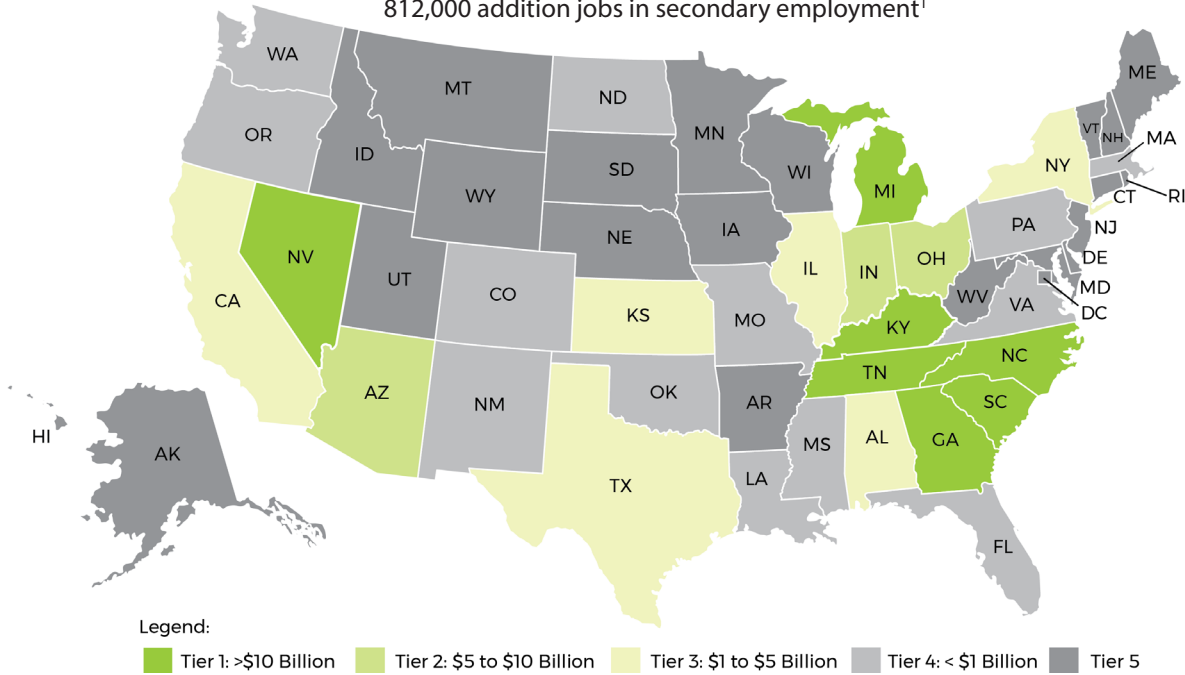
Investment has also been spurred by over \$24 billion in states and local incentives



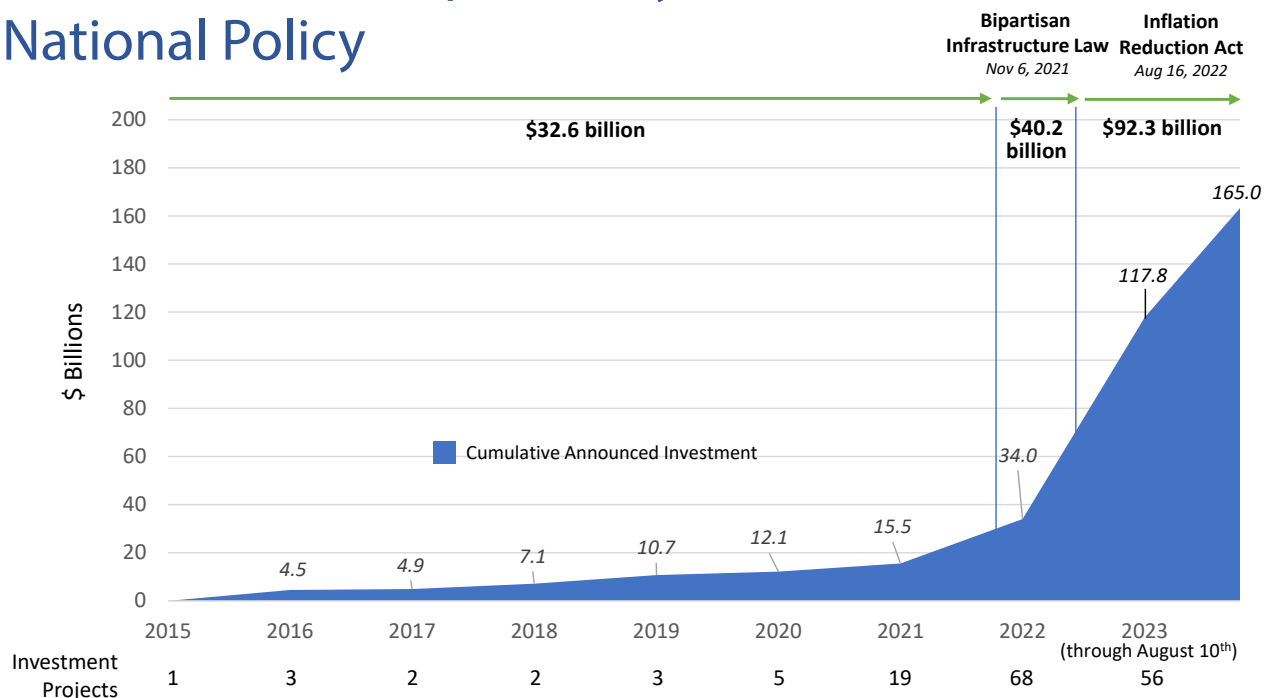
State	Total Announced Investment (\$ billions)
Georgia	31.5
Michigan	18.9
Tennessee	18.4
South Carolina	13.1
Nevada	13.0
Kentucky	11.4
North Carolina	10.3
Ohio	9.9
Arizona	9.7
Indiana	9.3
Other	19.6
Total	165.1

Announced EV Ecosystem Investment

- ▶ 159 manufacturing investments announced in the past 8 years
- ▶ \$165 billion in private investment announced
- ▶ These investments will result in 179,000 new jobs, and could generate up to 812,000 addition jobs in secondary employment¹



EV Investment is Spurred by National Policy

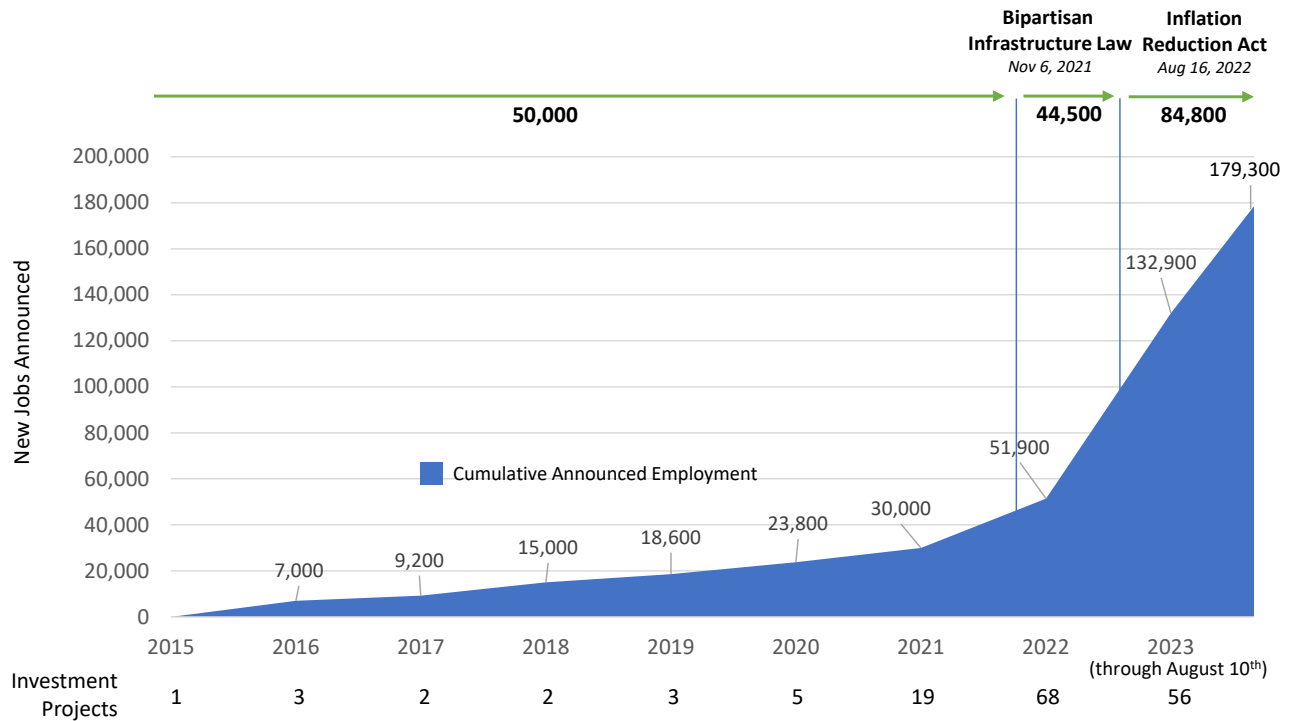


\$92.3 billion in announcements, representing 56% of all announced EV investments, have occurred in the 12 months since the passage of the IRA.

¹Climate 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*

New EV Job Announcements Accelerated by National Policy

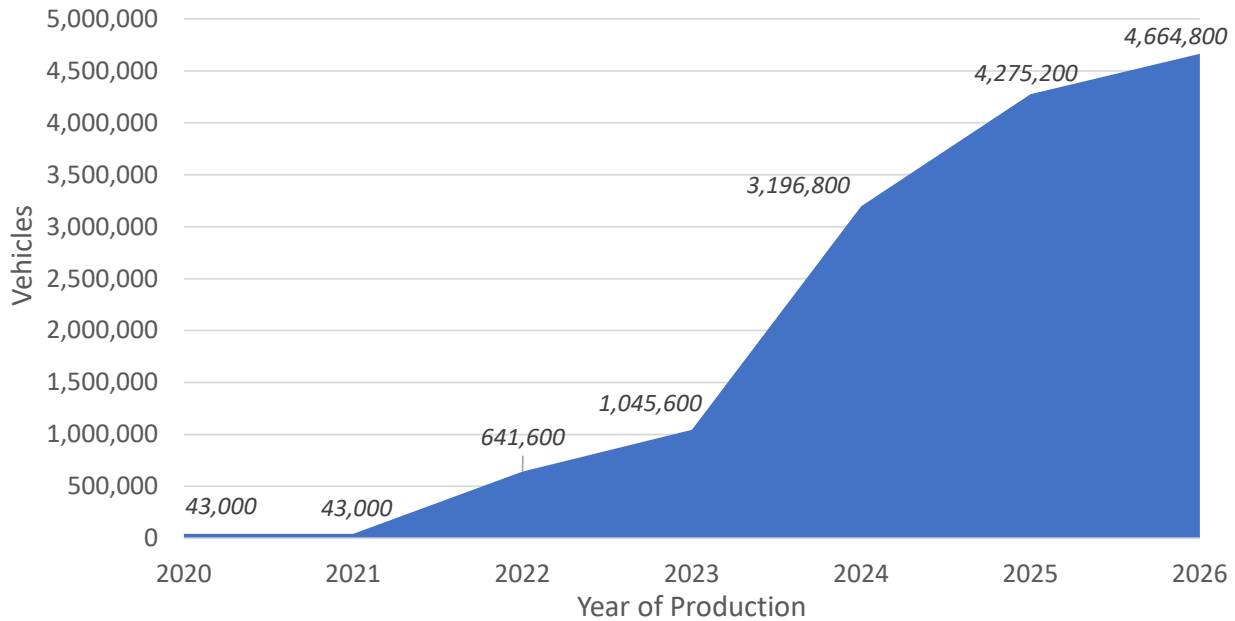
84,800 announced jobs, representing approximately 47% of all EV job announcements, have occurred in the last 12 months since the passage of the IRA.



State	Announced New Jobs
Georgia	33,600
Tennessee	20,500
Michigan	19,700
South Carolina	18,000
Kentucky	12,900
Nevada	12,400
North Carolina	11,900
Arizona	9,700
Indiana	6,700
Illinois	6,700
Other	27,200
Total	179,300

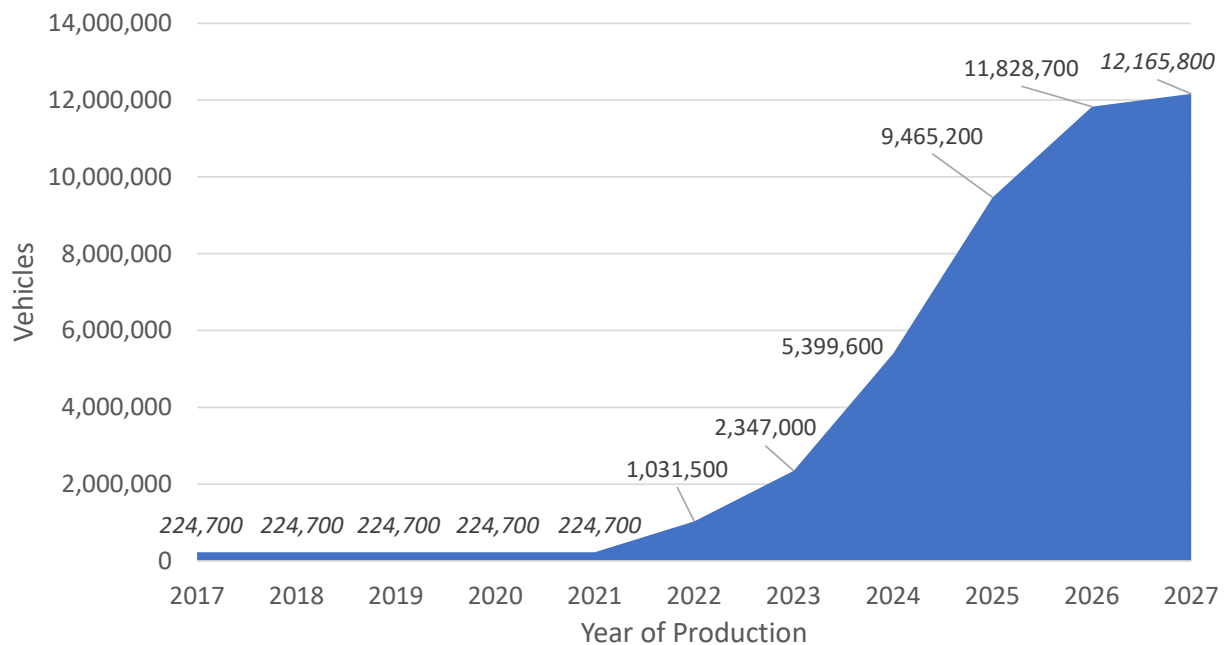
Total EV Manufacturing Capacity

U.S. EV manufacturing facilities will be capable of producing approximately 4.7 million new passenger vehicle each year in 2026, which represents approximately 36 percent of all new vehicles sold in 2022.



Battery Manufacturing Capacity

In 2027, U.S. battery manufacturing facilities will be capable of producing batteries sufficient to supply up to 12.2 million new passenger vehicle each year, which represents approximately 95 percent of new vehicles sold in 2022.



Key Takeaways – August 10, 2023

- ▶ **Investment.** Over the last 8 years, manufacturers have announced \$165 billion in concrete investment in U.S. EV and EV battery manufacturing facilities. Federal policies have dramatically expanded and accelerated these investments: 56 percent of announced EV investments have occurred in the last 12 months since passage of the IRA and 80 percent have occurred in the last 21 months since passage of the Bipartisan Infrastructure Law
- ▶ **Jobs.** Supported by these investments, over the last 8 years, manufacturers have announced 179,300 new 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 new EV jobs announced since 2015, 47 percent are represented by announcements occurring in the last 12 months (since the passage of the IRA) and 72 percent are represented by announcements occurring in the last 21 months since the passage of the BIL. Announced EV and battery manufacturing could also generate up to 812,000 additional jobs in indirect/secondary employment.
- ▶ **States.** 10 states account for 88 percent of announced EV manufacturing investments. Georgia has over \$31 billion in investment supporting 36,600 jobs. Michigan and Tennessee have seen \$19 billion and \$18 billion in investment, respectively, supporting roughly 20,000 new jobs in both states.
- ▶ **Production Capacity.** In 2026, U.S. EV manufacturing facilities will be capable of producing approximately 4.7 million new passenger vehicles annually (which represents 36 percent of new vehicles sold in 2022). In 2027, U.S. battery manufacturing facilities will be capable of producing batteries sufficient to supply 12.2 million new passenger vehicles each year (which represents 95 percent of new vehicles sold in 2022).
- ▶ **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 ecosystem 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.

Methodology

This report summarizes private investments made or announced within the past 8 years in the U.S. electric vehicle (EV) ecosystem. This includes investments in the manufacturing of EVs, EV batteries, and EV battery components. The research built off previous work contained in the Environmental Defense Fund's (EDF's) April 2022 document, *Electric Vehicle market Update: Manufacturer Commitments & Public Policy Initiatives Supporting Electric Mobility in the U.S. & Worldwide*. The research builds off of the first iteration of this report, which was issued on March 16, 2023, the six-month anniversary of the passage of the IRA. The research revolved around internet searches of investment announcements in the EV manufacturing ecosystem in the U.S. in 2023, as well as review of the [list of over 200 emission reduction 200 projects](#) that Environmental Entrepreneurs (E2) has traced since the passage of the IRA, nearly half of which are related to EV manufacturing.

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 and nationality
- ▶ Investment type (EV assembly plant, Battery manufacturing plant, Battery component plant)
- ▶ Location (City, State)
- ▶ Announced investment value (\$ billions)

- ▶ Facility production capacity (vehicles/year, Gigawatt-hours/year, tons/year)
- ▶ Announced facility employment (number of jobs)
- ▶ 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 159 individual investment announcements, 66 of which were not included in the earlier iteration of the report. The data set only includes projects with announced investment levels and known construction start or completion dates. If an investment was announced, but no corroborating information could be found that it had actually entered construction or operation, it was excluded from the data set. In all, the research identified 33 projects announced prior to the passage of the BIL on November 6, 2021; 25 projects announced after passage of the BIL and before adoption of the IRA, and 101 projects announced in the 12 months following 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 ecosystem could generate as many as 812,000 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 \$165.1 billion in total investment, 98% are announced investment levels, the remaining 2% have been calculated. Of the cumulative 179,300 EV ecosystem jobs announced between 2015 and August 10, 2023, 89% are announced jobs, with the remainder estimated jobs. Of the 4.7 million annual EV manufacturing capacity expected online in 2026, 77% is announced capacity and the remainder is estimated capacity. Of the 12.2 million annual EV battery manufacturing capacity expected online in 2026, 81% 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. 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 different measures used to quantify the production of battery component plants, this information was noted, but not included in the quantitative analysis.