U.S. Electric Vehicle Manufacturing Investments and Jobs

Characterizing the Impacts of the Inflation Reduction Act after 6 Months

March 2023

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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 EV, EV battery, and battery component manufacturing.

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

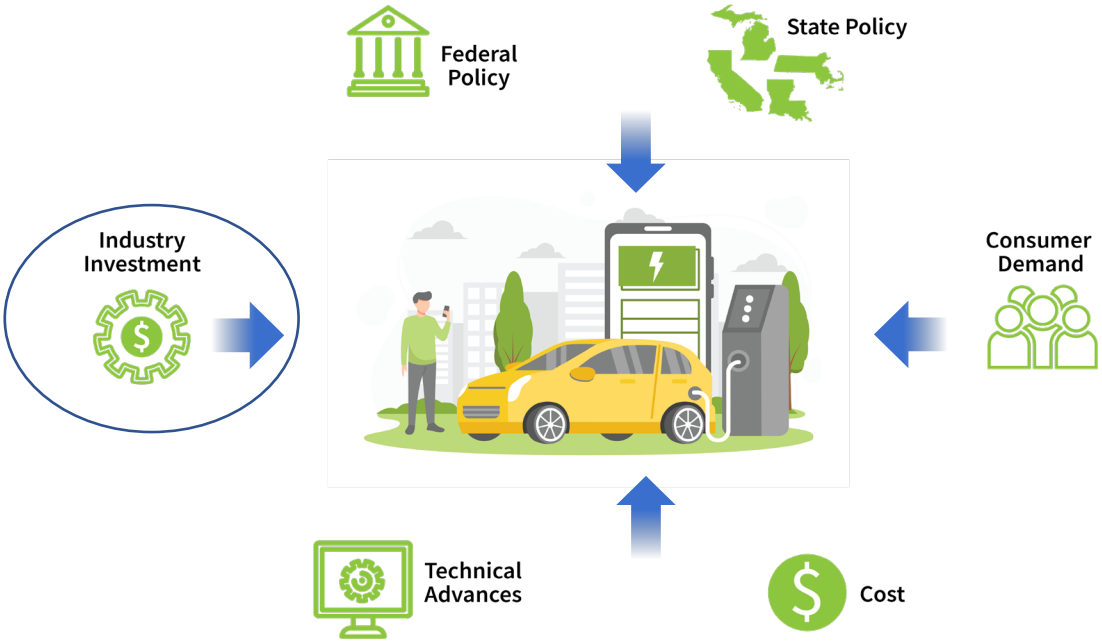
Manufacturing	Investment	Announced New Jobs*
Electric passenger vehicles	$31.4 billion	55,800
Electric vans, buses and trucks	$9.0 billion	17,400
EV batteries	$65.3 billion	61,700
EV battery components	$14.4 billion	8,100
Total	**$120.1 billion**	**143,000**

** 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



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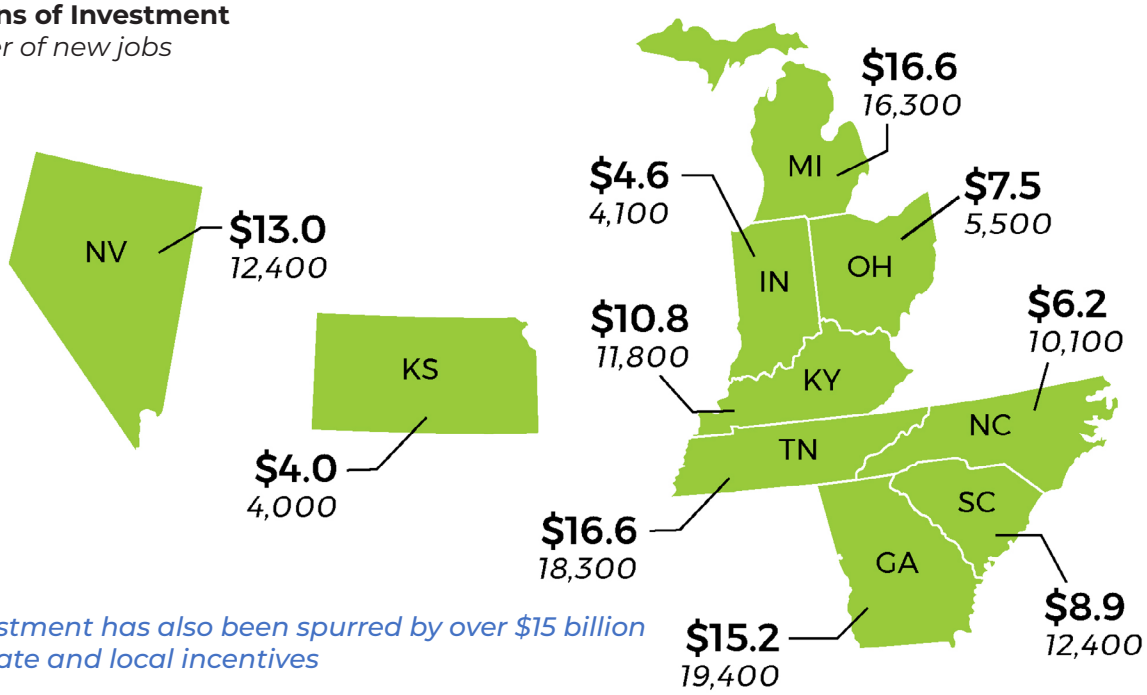
86% of Announced Investment is in 10 States

$ Billions of Investment
Number of new jobs

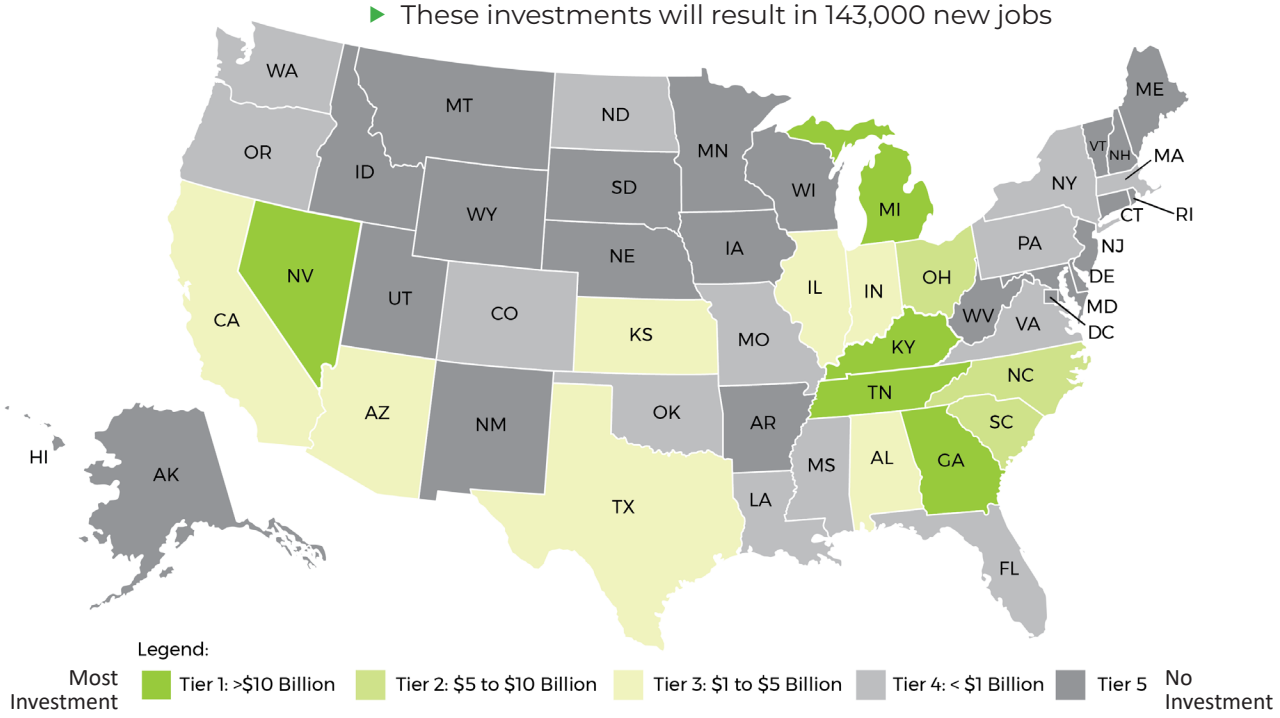


Investment has also been spurred by over $15 billion in state and local incentives

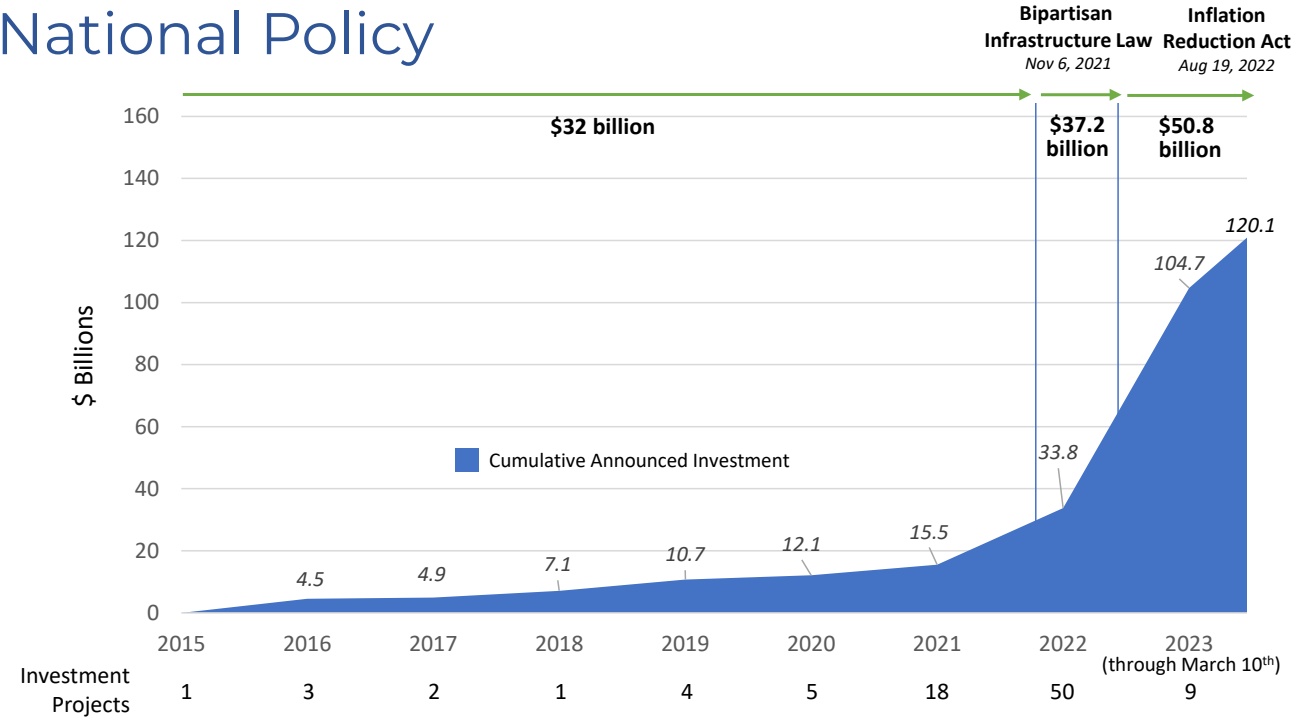
State	Total Announced Investment *($ billions)*
Michigan	16.6
Tennessee	16.6
Georgia	15.2
Nevada	13.0
Kentucky	10.8
South Carolina	8.9
Ohio	7.5
North Carolina	6.2
Indiana	4.6
Kansas	4.0
Arizona	3.7
California	2.5
Alabama	2.4
Texas	2.2
Illinois	1.3
Other	4.6
Total	**120.1**

Announced EV Ecosystem Investment

- 93 manufacturing investments announced in the past 8 years
- Over $120 billion in private investment announced
- These investments will result in 143,000 new jobs



EV Investment is Spurred by National Policy



$50.8 billion in announcements, representing 42% of all announced EV investments, have occurred in the 6 months since passage of the IRA.

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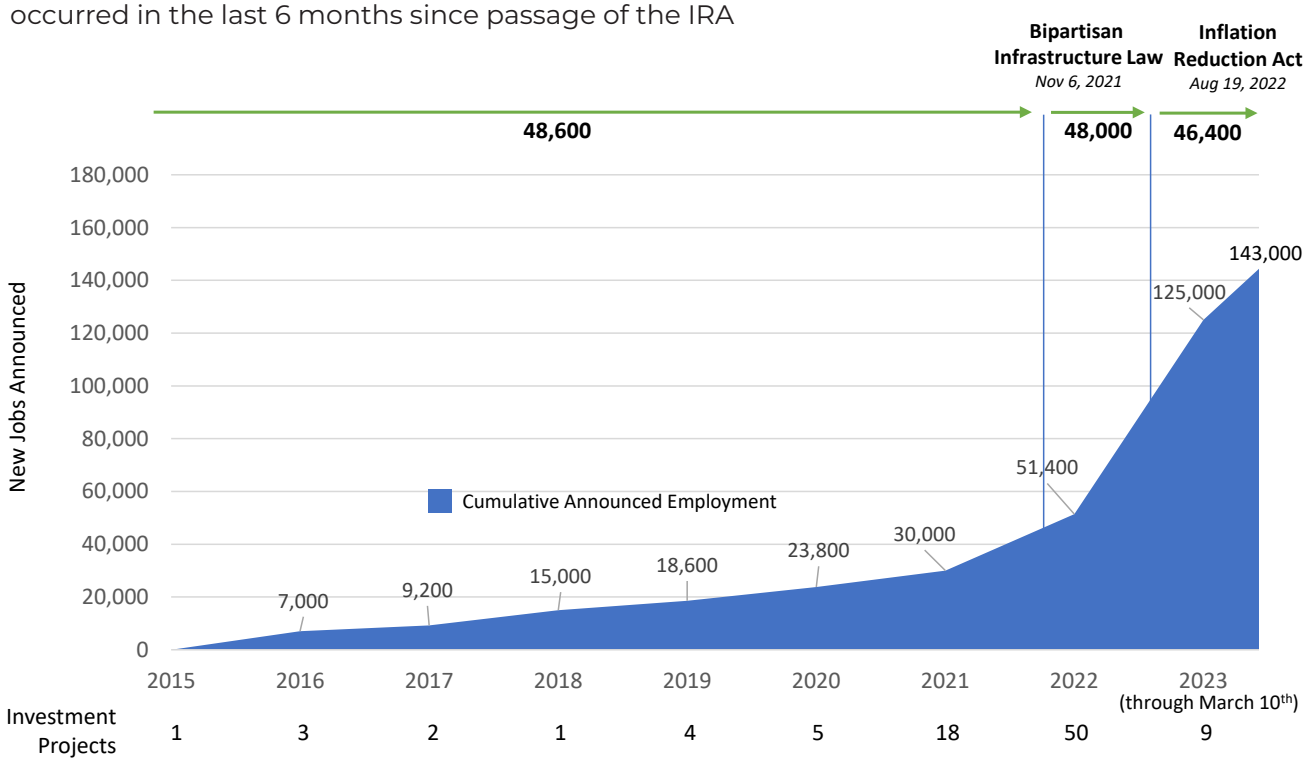
New EV Job Announcements Accelerated by National Policy

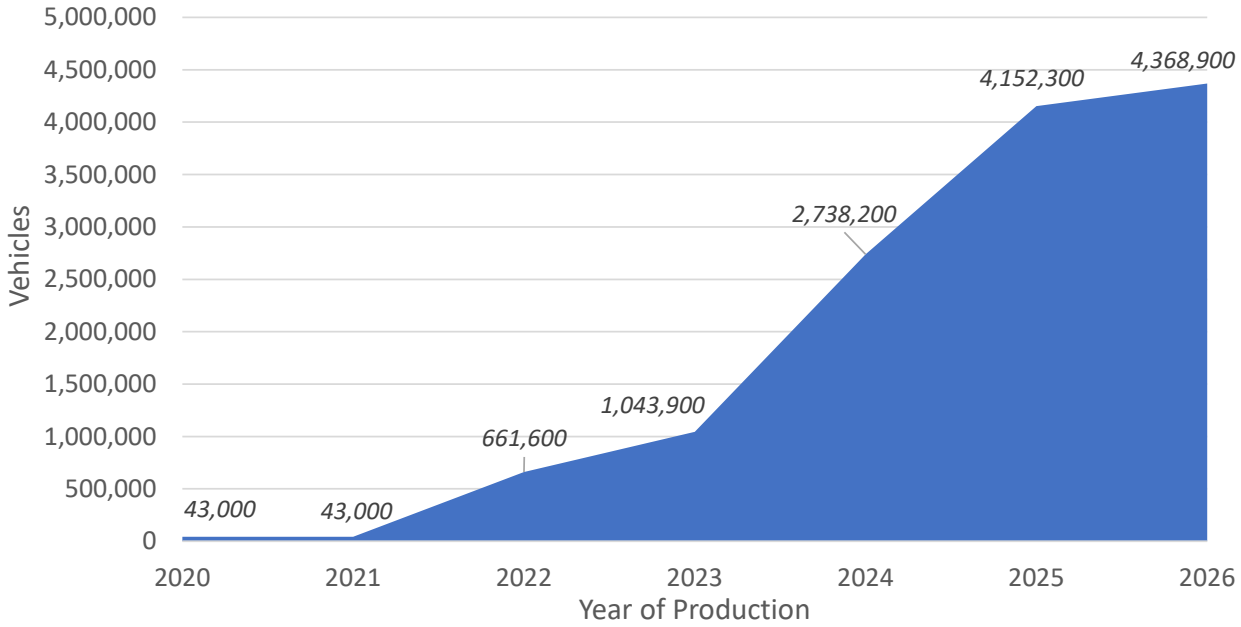
46,400 announced jobs, representing approximately 32% of all EV job announcements, have occurred in the last 6 months since passage of the IRA



State	Announced New Jobs
Georgia	19,400
Tennessee	18,300
Michigan	16,300
Nevada	12,400
South Carolina	12,400
Kentucky	11,800
North Carolina	10,100
Arizona	7,600
Illinois	6,600
Ohio	5,500
Texas	4,600
Indiana	4,100
Kansas	4,000
California	2,500
Alabama	1,500
Other	6,000
Total	**143,000**

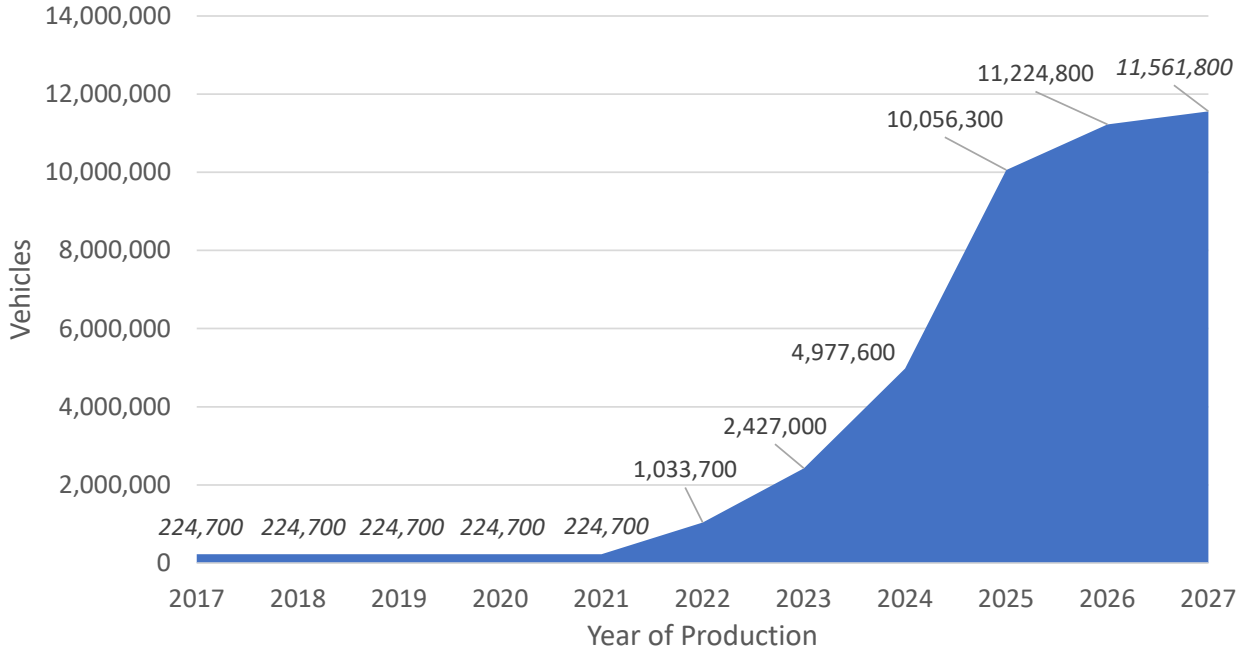
Total EV Manufacturing Capacity

U.S. EV manufacturing facilities will be capable of producing approximately 4.3 million new passenger vehicles each year in 2026, which represents approximately 33 percent of all new vehicles sold in 2022.



Battery Manufacturing Capacity

In 2026, U.S. battery manufacturing facilities will be capable of producing batteries sufficient to supply up to 11.2 million new passenger vehicles each year, which represents approximately 84 percent of new vehicles sold in 2022



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Key Takeaways

- **Investment.** Over the last 8 years, manufacturers have announced over $120 billion in concrete investment in U.S. EV and EV battery manufacturing facilities. Federal policies have dramatically expanded and accelerated these investments: 42 percent of announced EV investments have occurred in the last 6 months since passage of the IRA and 73 percent have occurred in the last 15 months since passage of the Bipartisan Infrastructure Law.
- **Jobs.** Supported by these investments, over the last 8 years, manufacturers have announced over 143,000 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, 32 percent are represented by announcements occurring in the last six months (since the passage of the IRA) and 66 percent are represented by announcements occurring in the last 15 months since the passage of the BIL.
- **States.** 10 states account for 86 percent of announced EV manufacturing investments. Michigan, Georgia, and Tennessee each individually have more than $15 billion in investments supporting more than 15,000 new jobs in the state.
- **Production Capacity.** In 2026, U.S. EV manufacturing facilities will be capable of producing approximately 4.3 million new passenger vehicles annually (which represents 33 percent of new vehicles sold in 2022). In 2026, U.S. battery manufacturing facilities will be capable of producing batteries sufficient to supply 11.2 million new passenger vehicles each year (which represents 84 percent of new vehicles sold in 2022).
- **Market Dynamism, Additional Policies.** U.S. investments, jobs, and production capacity will likely continue to grow in response to strong federal investments and incentives. 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 must 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) ecosphere. 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 began by compiling additional information on the 28 investment projects identified in Figure 9 of the EDF document and the subsequent table identifying "Announced Electric Vehicle Manufacturing Plant Expansions and Future Plans."

The research team developed a database with information on these projects found in on-line announcements put out by the 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

Through additional on-line searches, the research team identified 65 additional investments that were either announced or entered into production since the publication of the April 2022 EDF 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. The research also included a review of the 21 projects selected for a combined total of $2.8 billion in Battery Materials Processing and Manufacturing & Recycling Grants by the U.S. Department of Energy in October 2022.

In all, the research identified 16 projects announced between 2015 and 2020; 18 projects announced in 2021; 50 projects in 2022; and 9 projects through March 10, 2023.

While investment levels are known for all projects, not all other parameters of interest were available for all projects. The research team developed tailored average values for each facility type – EV, EV battery and battery component – for three parameters: employment, capacity, and construction time. In cases where jobs or production capacity data is unknown for a specific project, the research team estimated values for these parameters based on the announced investment value, and averages (production per $ billion investment and jobs per $ billion investment) for all announced similar projects for which this data is available. 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.

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 cumulative 143,000 EV ecosystem jobs announced between 2015 and March 10, 2023, 75% are announced jobs, with the remainder estimated jobs.

Of the 4.4 million annual EV manufacturing capacity expected online in 2026, 62% is announced capacity and the remainder is estimated capacity. Of the 11.5 million annual EV battery manufacturing capacity expected online in 2026, 82% 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 using a factor of 89 KWh/EV. 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.