

UNITED STATES ELECTRIC VEHICLE MARKET SUMMARY: Q3 AND Q4 2021

**A summary of key transportation electrification developments in
the United States during the third and fourth quarters of 2021**

By Nicole Lepre and Tom Taylor

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Executive Summary

Atlas Public Policy presents its first market summary report for the U.S. Department of Energy's Clean Cities network.¹ This report summarizes major developments in transportation electrification in the United States with a focus on activities during the third and fourth quarters of 2021 ("Q3 and Q4 2021").

Electric Vehicle² ("EV") sales made up 6.1 percent of light-duty³ sales in November and 5.8 percent in the fourth quarter of 2021, setting a monthly and quarterly record. Light-duty EV sales hit 189,000 during Q4 2021, the highest of any quarter through 2021. Automakers continued to announce major investments in EVs, with Toyota, Ford, GM, and Stellantis each announcing plans to invest at least \$30 billion to develop EV models by 2030 [1, 2, 3]. Investor-owned utilities ("IOUs") proposed more than twice the amount of investment in transportation electrification programs during Q3 than during Q1 and Q2 combined. The second half of the year saw the approval of \$414 million in utility EV programs, only slightly less than the \$468 million approved during the first half of the year.

The most potentially transformative policy developments during the second half of the year were from the federal government. On November 15, 2021, the bipartisan Infrastructure Investment and Jobs Act (HR 3684) was passed and included \$7.5 billion of funding for vehicle fueling infrastructure, including \$5 billion specifically for EV chargers. Across all programs in the law, there is \$8 billion of funding that supports zero-emission vehicle-related investments,⁴ an additional \$32 billion that could go to zero-emission vehicles but could also go to other fuel types, and \$10.5 billion for electric grid technology and battery development, recycling and research [4]. For reference, this is more funding for transportation electrification than has previously been announced by federal, state, and local governments and IOUs combined.

The other major piece of federal legislation that was being considered during the second half of the year, the Build Back Better bill did not have enough legislative support and no longer seems to have a viable path forward. The Build Back Better bill, passed by the House in November 2021, would have provided transformational levels of funding for EVs,

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² In this report, EV includes fully electric vehicles and plug-in hybrid electric vehicles.

³ Light-duty vehicles includes passenger cars, like sedans and coupes, as well as other light-duty vehicles, like pickups, minivans, utility vans, and SUVs.

⁴ This includes the \$5 billion National Electric Vehicle Formula Program (Division J), \$2.5 billion for zero emission school buses (section 71101), and \$0.5 billion for State Energy Programs (section 40109).

including at least \$23 billion dedicated to zero-emission vehicle-related investments [5]. Parts of the Build Back Better bill, such as the clean energy and EV tax credits, may still be passed as separate pieces of legislation. Figure 1 summarizes the key developments in transportation electrification that occurred during Q3 and Q4 of 2021.

Figure 1: Major Developments in Transportation Electrification During Q3 and Q4 2021

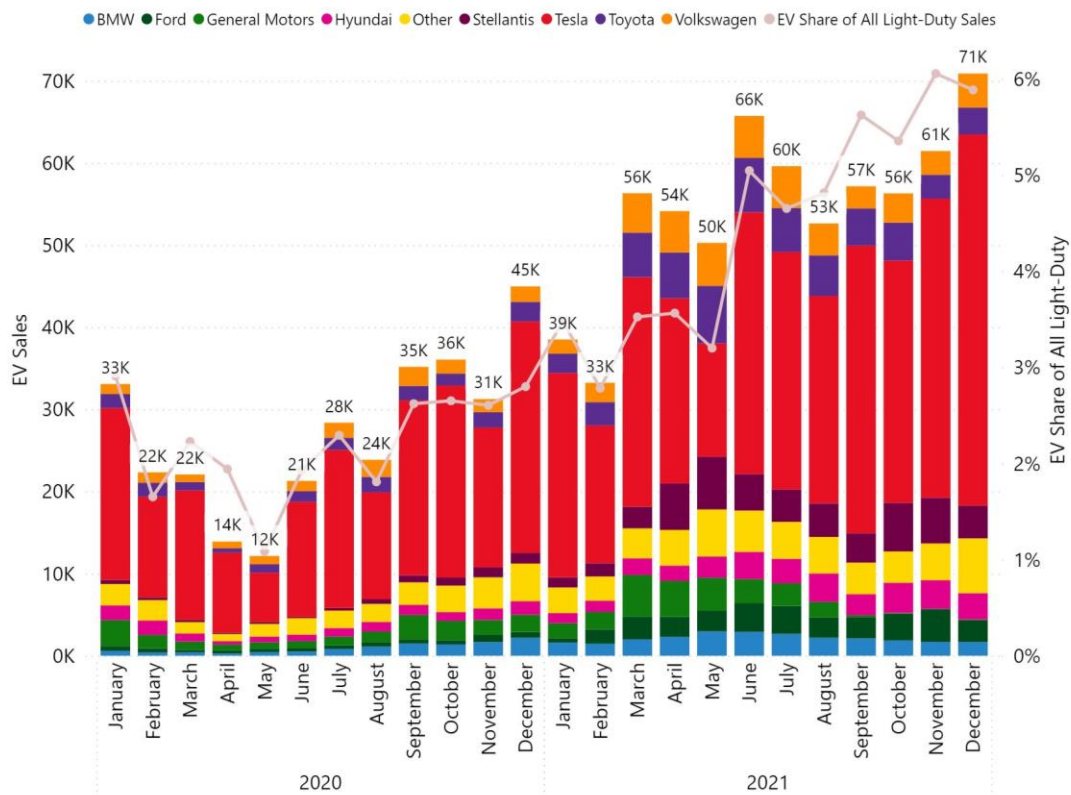
Q3 and Q4 2021 Highlights		
	Sales	<ul style="list-style-type: none"> Q4 was the highest quarter on record for light-duty EV sales (188,646) 5.8 percent of quarterly light-duty sales were EVs during Q4 (highest quarterly percentage to date)
	Industry	<ul style="list-style-type: none"> Ford, GM, Toyota, and Stellantis each announced at least \$30 billion of investments in EV Model Development by 2030
	Utility	<ul style="list-style-type: none"> Q3 saw more than twice the amount of EV program funding proposed than in Q1 and Q2 combined (\$781 million) \$414 million of EV programs were approved during Q3 and Q4 2021
	Policy and Investment	<ul style="list-style-type: none"> \$1 trillion bipartisan Infrastructure Investment and Jobs Act (HR 3684) was passed Passage of \$1.75 trillion Build Back Better bill very unlikely The Biden Administration signed an Executive Order establishing a target of 50 percent of light-duty vehicle sales to be battery electric, plug-in hybrid electric, or fuel cell electric in 2030 [6]

Light-duty EV Sales and Models

Sales

2021 was very strong for light-duty EVs² sales with Q4 setting a record for quarterly sales, at nearly 189,000, and December setting a record for monthly sales, at nearly 71,000.⁵ Every month during the year set a monthly year-over-year sales record. EVs reached a record high market share of 5.8 percent of all light-duty vehicles sales in Q4 and, for the full year, more than 656,000 light-duty EVs were sold, representing 4.4 percent of all light-duty vehicles sold. Figure 2 shows monthly EV sales by automaker, as well as the monthly EV sales percentage of light-duty vehicles. Notably, while light-duty internal combustion engine vehicle sales grew just two percent in 2021 compared to 2020, light-duty EV sales grew by more than 100 percent.

Figure 2: EV Sales by Month by Automaker since January 2020 through 2021



This figure shows monthly light-duty EV sales by automaker as well as the share of light-duty sales that were EVs.

Source: [7]

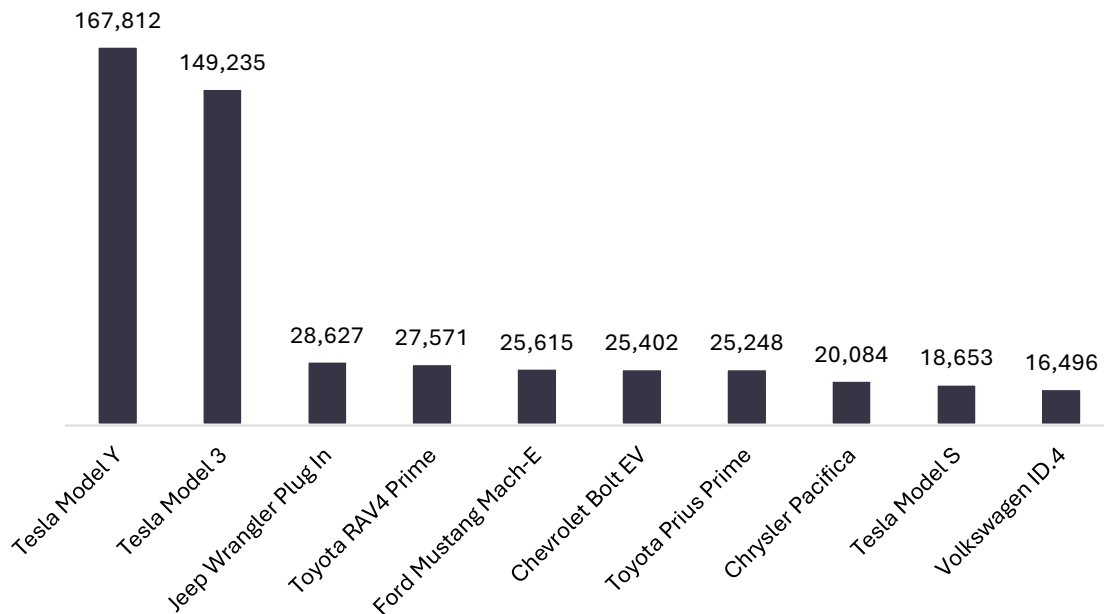
⁵ Except where stated otherwise, information in this section is from the Automakers Dashboard on EV Hub [7].

California led all states and Washington, D.C. on EV sales as a proportion of all light-duty vehicle sales during Q3 and Q4 2021, with 15.3 percent. Washington, D.C. came in second with 13.0 percent, Washington state was third with 9.7 percent, and Oregon was fourth with 9.3 percent.

Models

Tesla remained a dominant force in the EV market and claimed 56 percent of the light-duty EV sales during the second half of 2021, up from 46 percent during the first half of the year. Two Tesla models led the way: the Tesla Model 3 and the Tesla Model Y. New models continue to enter the market, and three models released in 2021 together represented over 10 percent of EVs sold in 2021. These three models – the Jeep Wrangler Plug-in, Ford Mustang Mach-E, and Volkswagen ID.4 – were the third, fifth, and tenth bestselling EVs in 2021. Figure 3 summarizes the top 10 light-duty EV models by annual sales in 2021.

Figure 3: EV Sales in 2021 (Top 10 Models)



This figure summarizes the top 10 light-duty EV models by annual sales in 2021.

Source: [7]

In late 2021, Lucid began deliveries of the Lucid Air and sold 88 vehicles in Q4. Rivian also sold its first vehicles during the second half of 2021, tallying 577 vehicle sales [8] [9].

Further, Ford F-150 Lightning reservations, which require a down payment, hit nearly 200,000 before they were closed. The first pre-production F-150 Lightning vehicles began leaving the factory in September [10].

Medium- and Heavy-Duty EVs

Medium and Heavy-Duty (“MDHD”) EV registrations (vehicle classes 3 – 8) remain low.⁶ At the end of 2021, there were just over 2,000 electric MDHD registrations around the country out of more than 26 million total registered MDHD vehicles. Nearly 50 percent of registered MDHD EVs were in California and more than 75 percent were buses. Washington State had 262 registrations, the second highest, and no other state had more than 100 registrations as of the end of 2021. Notably, Calstart released a report in early 2022 that indicated there are more than 140,000 zero emission trucks on order [11].

States continue to progress legislation to encourage the sale of MDHD EVs. During the second half of 2021, Oregon, New York, Washington, and New Jersey adopted the Advanced Clean Truck (“ACT”) rule. The ACT rule requires manufacturers who sell MDHD vehicles to sell zero-emissions vehicles as an increasing percentage of their annual sales from 2024 to 2035. The ACT originated in California and can be adopted by other states under the authority of the Clean Air Act. With the recent adoption by New York, Oregon, Washington, and New Jersey, there are currently five states, including California, that have adopted the rule. 11 other states that signed a Memorandum of Understanding in July 2020 to stop selling internal combustion engine MDHD vehicles by 2050 may be the next to adopt the ACT rule [12].⁷

California, New York, and New Jersey are the only states to offer recurring vouchers for electric buses and trucks. Total funding awarded or available from these voucher programs through December 2021 is summarized below:

- California Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (“HVIP”): \$600 million awarded [13]
- New York Truck Voucher Incentive Program (“NYTVIP”): \$15.2 million awarded [14]

⁶ Except where stated otherwise, the information in this section is from the Medium- and Heavy-Duty Vehicle Electrification Dashboard on EV Hub [39].

⁷ On July 14, 2020, 15 states and the District of Columbia signed the MOU. The 15 states are California, Connecticut, Colorado, Hawaii, Maine, Maryland, Massachusetts, New Jersey, New York, North Carolina, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington.

- New Jersey Zero Emission Incentive Program (“ZIP”): \$44 million available (\$13.5 million awarded) [15]

In addition to voucher programs, states have provided funding for electric MDHD vehicles through a variety of grant programs, most notably the Volkswagen Settlement program. Charging stations lead all project types for public funding with \$990 million through 2021 followed by transit buses with \$849 million. Electric school buses also continued to see large increases in funding awards, increasing from \$329 million at the end of 2020 to \$390 million through 2021. Furthermore, the federal bipartisan Infrastructure Investment and Jobs Act (HR 3684) includes \$2.5 billion for zero emission school buses and another \$2.5 billion for zero or low emission school buses.

In November 2021, Atlas Public Policy released research on the MDHD charging infrastructure needs to meet 100 percent of electric medium- and heavy-duty truck sales by the end of 2040, in line with government and corporate targets. The study found that between \$100 and \$166 billion in charging infrastructure investments will be needed this decade in order to put the U.S. on track to reach the target [16]. This reflects installed charging infrastructure costs not expected to be covered by electric utilities. The study found a need for a significant ramp-up in charging of all kinds, including at-home charging for pickup trucks; depot charging for fleets; and a variety of on-road charging options, including some ultra-high-powered stations for long-haul trucks.

Private Investments

The private sector, such as automakers and battery manufacturers, continued to announce significant investments in the production of EVs in the U.S., with about \$159 billion of investments announced through 2021 [17]. Of that, \$42 billion was announced during the second half of 2021. In September, Ford and battery manufacturer SK Innovation together announced plans to invest \$11 billion to build EVs in Kentucky and Tennessee. According to Ford, this project will create 11,000 jobs between the two states. This was the largest private investment in Kentucky’s history [18]. The investment will fund the production of the F-150 Lightning, the electric version of the highest-selling vehicle in the country. As part of the announcement, Ford also announced a plan to collaborate with Redwood Materials on a closed-loop battery recycling system.

In December 2021, Toyota announced a \$1.2 billion investment in a new North Carolina facility that will come online in 2025 [19]. The facility could create 1,750 jobs according to Toyota. The facility will be able to deliver enough lithium-ion batteries for up to 1.2 million

EVs per year. In addition, Rivian announced a \$5 billion investment in a manufacturing plant outside of Atlanta, Georgia, that it says will eventually create 7,500 jobs [20].

In July, Stellantis announced plans to invest more than \$35 billion in EVs, keeping pace with investments announced by GM in June and by Ford in May. The Detroit Three have now collectively committed more than \$100 billion to electrification. Alongside Stellantis, there were also announcements from several other automakers including Daimler and Rivian. Major automakers continue to announce substantial investments in electric vehicles, and in December 2021, Toyota joined the group of automakers committed to moving forward on electrification by announcing plans to invest \$35 billion to build 30 battery-electric vehicle models by 2030 [21].

Figure 4: Major Automaker Investment Announcements in 2021

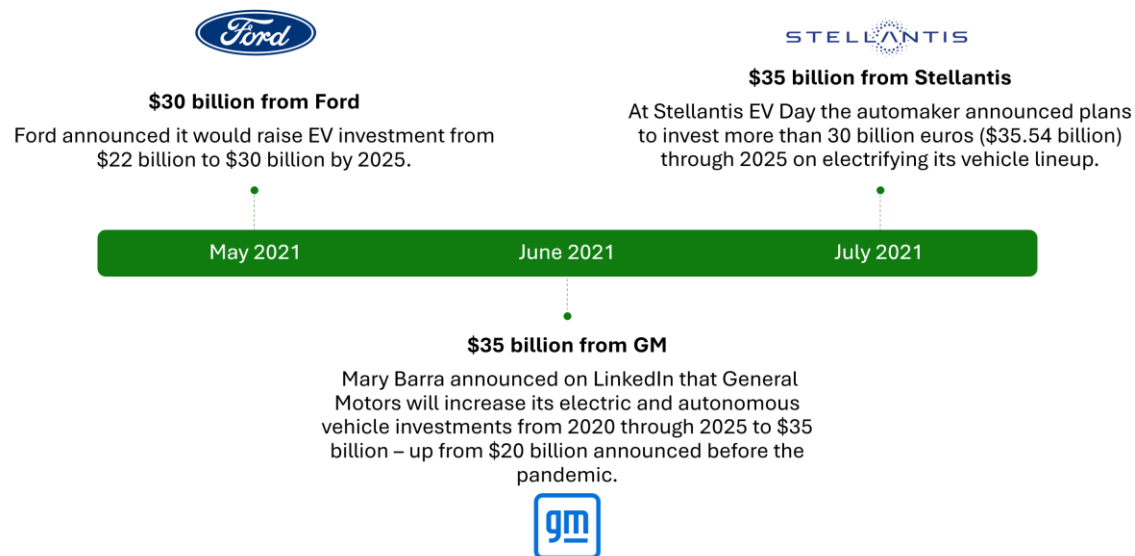


Figure 4 summarizes major electric vehicle investment announcements made by Ford, GM, and Stellantis.

Source: [7]

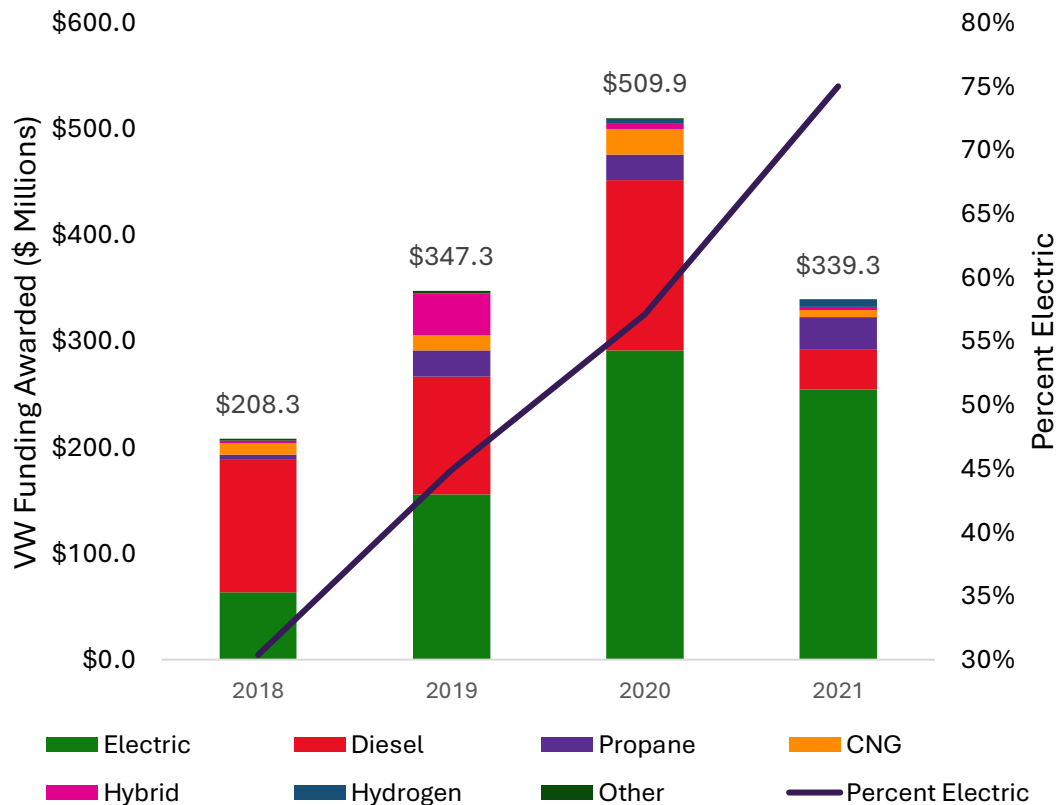
Public Policy

Volkswagen Settlement Environmental Mitigation Trust

The \$2.7 billion Volkswagen (“VW”) Environmental Mitigation Trust (EMT), established in the settlement of accusations that VW violated the Clean Air Act, continues to be a key source

of funding for electrification efforts around the country [22]. Through the end of 2021, state beneficiaries of the Settlement’s EMT awarded or made available \$763 million for transportation electrification initiatives.⁸ States awarded or made available more than \$338 million in EMT funds in 2021 from 34 states. Of that funding, \$253 million went to electric transportation projects, representing 75 percent of the total, up from 57 percent in 2020 and setting an annual record.

Figure 5 Environmental Mitigation Trust Funding Awarded and Available through 2021 (\$ millions)



This figure summarizes Environmental Mitigation Trust awards through 2021. Electric transportation made up 75 percent of funding in 2021, the highest annual percentage yet. Cumulatively through 2021, electric transportation made up 54 percent of total funding awards.

Source: [23]

⁸ All information in this section is from the Volkswagen Settlement dashboard on EV Hub unless noted otherwise [23].

Electric transportation made up 54 percent of total funding awards through 2021, with school and transit buses accounting for nearly half of these electric transportation awards. Around 50 percent of EMT funds remain unspent.

States awarded and made available \$115 million in EMT Funding in the second half of 2021 for transportation electrification initiatives. The three largest allocations were in Texas (\$20 million), Virginia (\$10 million), and Connecticut (\$10 million). 2021 set an annual record at \$97 million for annual investment of EMT funds in charging stations.

State and Local Policies

States continued to establish EV policies around the country, and there were several highlights in the second half of 2021. In Illinois, Governor J. B. Pritzker signed the Climate and Equitable Jobs Act. The Act established a goal of one million fully-electric vehicles in Illinois by 2030 [24]. To achieve that goal, the state will provide EV rebates of \$4,000, and will require the Illinois Environmental Protection Agency to provide rebates to fund 80 percent of the installation costs for Level 2 or Level 3 chargers (DCFC). The Act will also require utilities serving more than 500,000 customers to file beneficial electrification plans by July 2022 for programs that will start no later than January 1, 2023 [24]. Another highlight was in New York where Governor Kathy Hochul signed a 100 percent zero emission vehicle sales requirement for passenger vehicles by 2035 and MDHD vehicles by 2045. Finally, in the Midwest, Minnesota adopted California's LEV and ZEV standards, becoming the 15th Clean Cars State [25].

Q4 2021 saw a flurry of developments around the country regarding the Advanced Clean Trucks Rule (ACT). The ACT started in California and requires that manufacturers sell an increasing percentage of electric MDHD vehicles as part of their annual sales through 2035. In 2021, [Oregon](#), [Washington](#), [New Jersey](#), and [New York](#) adopted the ACT and Maine and [Massachusetts](#) proposed adoption [26, 27, 28, 29, 30, 31].

Federal Policies and Investment

The bipartisan Infrastructure Investment and Jobs Act (HR 3684) and the Build Back Better bill stole the federal transportation electrification policy spotlight during the second half of 2021. Each package represented greater funding for EVs than the combined funding that has been provided by state and local governments and investor-owned utilities to date. On November 15, 2021, the \$1 trillion bipartisan Infrastructure Investment and Jobs Act was signed into law by President Biden. The law includes \$7.5 billion for vehicle fueling infrastructure, with \$5 billion of that specifically for EV charging. Across all programs in the law, there is a total of \$8 billion of funding for zero-emission vehicle-related programs⁴, an

additional \$32 billion that could go to EVs but could also go to other fuel types, and \$10.5 billion for electric grid technology and battery development, recycling, and research [4].

Negotiations in Congress on the Build Back Better bill continued through most of the fourth quarter but ultimately, there was not enough support for the bill. As of March 2022, when this report was written, the bill does not seem to have a viable path forward. The bill, which was passed by the House in November 2021, included \$1.75 trillion for social and climate-related policies. Among this funding was \$209 billion of funding eligible for EV-related investments [5]. Of that, \$24 billion was dedicated zero-emission vehicle-related investments, \$96 billion was for EV Tax Credits (as per Joint Committee on Taxation estimates), and \$89 billion was included that could go to EVs as well as other fuel types. There is still a possibility that parts of the Build Back Better bill, such as the clean energy and transportation tax credits, could be passed as separate legislation.

In August, the Biden Administration signed Executive Order 14037, which establishes a target for 50 percent of all light-duty vehicles sold in 2030 to be battery electric or plug-in hybrid electric [32]. The Executive Order also called on the Environmental Protection Agency (EPA), under the Clean Air Act, to begin drafting multi-pollutant and fuel efficiency standards. The standards would include light- through heavy-duty vehicles and would begin once the current standards end. Notably, the executive order has the support of several large automakers.

Non-Governmental Organization Initiatives

The Zero Emission Transportation Association (ZETA), a coalition of industry, advocates, and nongovernmental organizations that advocates for 100 percent of vehicles sold in 2030 to be electric, was active in 2021.⁹ Notably, ZETA was involved in challenging the USPS' plans to procure a 90 percent gas vehicle fleet for its next-generation delivery vehicles rather than a cleaner, more electric fleet. ZETA conducted an analysis on the USPS' decision-making process and concluded the process was "error-ridden," and sent a letter to the USPS Board of Governors urging the USPS to pause the procurement [33]. Upon the USPS' decision on February 23, 2022, to continue with its planned 90 percent gas vehicle procurement, ZETA condemned the decision [34].

⁹ See ZETA's website for more information about ZETA's activities: <https://www.zeta2030.org/>

ZETA has been engaged in other advocacy efforts including supporting clean energy and transportation tax credits, medium- and heavy-duty (MDHD) electrification through the Advanced Clean Truck (ACT) rule, increased federal funding for the Energy Department's Loan Programs Office, and federal investments in the battery supply chain [35]. In addition, in August, ZETA announced that they joined the National EV Charging Initiative to work to create a national EV charging network [36]. Others that have joined the Initiative include companies, union members, investors, and advocates.

Utility Investments

During the second half of 2021, investor-owned utilities (IOUs) were approved to invest \$414 million in transportation electrification programs, slightly less than the \$468 million approved during the first half of the year.¹⁰ The programs approved during the second half of 2021 could support more than 1,200 DC fast chargers and more than 74,000 Level 2 ports. Overall, 2021 saw less approved IOU investment than 2020 – \$882 million in 2021 compared to \$1,167 million in 2020 – however, there was about twice as much new investment proposed, coming to a total of \$2 billion.

One of the most noteworthy IOU program developments during the second half of 2021 was the approval on December 2, 2021, for Florida Power & Light (FP&L) to invest \$205 million over four years in public DC fast chargers and Level 2 chargers. FP&L will own the chargers, making this the largest utility-owned charger program by dollar amount to date. Other notable approvals include Nevada Energy's and Sierra Pacific Power Company's combined nearly \$100 million four-year Economic Recovery and Transportation Electrification Plan. There were also two programs approved in Connecticut from Eversource and United Illuminating, the first approved IOU-funded transportation electrification programs in Connecticut. Together they will provide \$74 million and could support 581 DCFC and 62,000 L2 ports, with 10 percent of multi-unit dwelling chargers targeted to be in underserved communities.

The second half of 2021 also saw major proposed programs, including a \$276 million program proposed by Pacific Gas & Electric aimed entirely at providing charging for residents of multifamily buildings. The program proposes building chargers both at multifamily buildings as well as near multifamily buildings. Massachusetts IOUs also proposed major programs, including \$276 million from National Grid and \$191 million from Eversource. Both Massachusetts programs are sequel programs and seek to build off lessons learned from previous programs. Hawaiian Electric also proposed to invest \$79

¹⁰ All information in this section is from the Utility Filings dashboard on EV Hub unless noted otherwise [38].

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million in company-owned public DC fast chargers and Level 2 chargers. Table 1 summarizes utility investment activity during the second half of 2021.

Table 1: Utility Investment Activity During the Second Half of 2021

Utility	State	Investment	Status	Docket Number
National Grid	MA	\$276,690,000	Filed	21-91
Pacific Gas & Electric Company	CA	\$275,800,000	Filed	A2110010
Florida Power & Light Company	FL	\$205,000,000	Approved	20210015-EI
Eversource	MA	\$191,809,600	Filed	21-90
NV Energy	NV	\$99,814,000	Approved	21-09004
Hawaiian Electric Company	HI	\$78,630,000	Filed	2021-0173
Eversource	CT	\$73,657,123	Approved	17-12-03RE04
Baltimore Gas and Electric Company¹¹	MD	\$20,974,000	Filed	9478
Dominion Energy Virginia	VA	\$18,700,000	Filed	PUR-2021-00151
Evergy	KS	\$13,850,000	Approved	21-EKME-320-TAR
PNM	NM	\$9,163,000	Approved	20-00237-UT
Minnesota Power	MN	\$4,936,191	Approved	M-21-257
Potomac Electric Power Company¹¹	MD	\$4,550,000	Filed	9478
Xcel Energy	MN	\$4,125,500	Approved	M-20-711
Duquesne Light Company	PA	\$3,814,480	Approved	R-2021-3024750

¹¹ On January 11, 2022, the Maryland Public Service Commission partially approved and partially denied this program.

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Utility	State	Investment	Status	Docket Number
Potomac Edison¹¹	MD	\$1,152,000	Filed	9478
Unitil	MA	\$988,000	Filed	21-92
Duquesne Light Company	PA	\$503,650	Withdrawn	R-2021-3024750
Eversource	KS	\$100,000	Withdrawn	21-EKME-320-TAR

This table summarizes transportation electrification investment activity from investor-owned utilities that occurred during the second half of 2021. Only programs that included funding are listed in the table.

Through the end of 2021, IOUs have been approved to invest nearly \$3.5 billion in transportation electrification. These approved programs could support more than 7,500 DC fast chargers and more than 298,000 Level 2 ports. For reference, Electrify America, the nation's largest non-Tesla fast charging network provider, has installed around 2,900 DC fast chargers since 2017 and ChargePoint, the nation's largest Level 2 network provider, has installed more than 45,000 Level 2 ports over the last 14 years [37]. Proposed IOU programs pending a commission decision could provide an additional \$2.9 billion of investment and support an additional 3,000 DCFC and 263,000 Level 2 ports. Figure 6 summarizes approved, proposed, and denied IOU investments in transportation electrification through 2021.

Figure 6: Investor-Owned Utility Investments in Transportation Electrification Through 2021

Approved	Pending/Filed	Denied/Withdrawn
34 States	24 States	22 States
122 Filings	61 Filings	40 Filings
53 Utilities	37 Utilities	27 Utilities
\$3,496,447,282 Investment	\$2,898,998,613 Investment	\$538,470,126 Investment
7,531 DC Fast Charging Stations	3,798 DC Fast Charging Stations	504 DC Fast Charging Stations
298,230 Level 2 Charging Stations	272,195 Level 2 Charging Stations	86,668 Level 2 Charging Stations

This figure summarizes approved, proposed, and denied IOU investments in transportation electrification through 2021.

Source: [38]

Conclusion

The second half of 2021 saw major progress in transportation electrification, with records and near-records in light-duty EV sales, private sector investment announcements, and investor-owned utility investments. Perhaps the most significant development in transportation electrification in recent history was the approval in November of the \$1 trillion bipartisan Infrastructure Investment and Jobs Act (HR 3684), which includes \$7.5 billion for vehicle fueling infrastructure, including \$5 billion for EV charging specifically, and a total of more than \$8 billion of funding eligible for EV-related investments.⁴ Despite this progress, the EV industry also saw a significant setback when the Build Back Better bill failed to gain enough support in Congress, leaving the potentially transformative bill with no viable path forward. The bill would have provided at least \$23 billion of funding dedicated to zero emission vehicle-related investments [5]. There is still a possibility that parts of the Build Back Better bill such as the clean energy and transportation tax credits will pass as individual pieces of legislation. 2022 will be a pivotal year as states decide how to invest the funds in the Infrastructure Investment and Jobs Act. Coordination among states, utilities, the private sector, and the federal government over the next few years will be essential in determining the future of transportation electrification in the United States.

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