
CENTER FOR AUTOMOTIVE RESEARCH

# The Inflation Reduction Act: Clean Vehicle Credits

## *A CAR Whitepaper*

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# ABOUT THE AUTHORS

The Center for Automotive Research is an independent non-profit that produces industry-driven research and fosters dialogue on critical issues facing the automotive industry and its impact on the U.S. economy and society. CAR researchers closely track current and future global automotive industry and technology trends and assess their impacts. CAR researchers also study international collaborations and stay abreast of changes in international trade and regulatory environments, the development of technology standards, and the deployment of new vehicle technologies.

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# INTRODUCTION

On August 16, President Biden signed the Inflation Reduction Act (IRA) of 2022 into law. The law will, among many things, allocate nearly $370 billion to climate and energy-focused investments and incentives. The IRA resulted from a hard-fought effort that created a complex regulation. One of the many things the IRA does is amends the existing Qualified Plug-in Electric Drive Motor Vehicle Credit program by creating the Clean Vehicle Credit provision, a key element of the IRA and one that is likely to have a significant impact on the clean vehicle market. The CVC maintains the $7,500 tax credit for consumers who purchase a new clean vehicle, i.e., battery electric vehicles (BEV), plug-in electric vehicles (PHEV), and fuel cell electric vehicles (FCEV) while eliminating the current 200,000 vehicle cap per automaker. It also allows consumers to receive a $4,000 tax credit for purchasing a used clean vehicle. Although the IRA extends the $7,500 tax credit for consumers, which is now available at the point of sale, it also adds critical qualifications and restrictions, including strict eligibility requirements for vehicle assembly and critical mineral and battery sourcing for manufacturers. The new law also imposes vehicle manufacturer's suggested retail price (MSRP) limits and personal income caps for consumers purchasing clean vehicles.

The IRA Clean Vehicle Credits attempts to address many challenges regarding consumer acceptance of BEVs and other advanced propulsion technologies. One key objective of the regulation is to support President Biden's goal of reaching 50 percent EV market share by 2030 while ensuring a strong domestic supply base for this critical technology. The U.S. has recently faced supply chain challenges causing long wait times, along with serious national security concerns due to foreign markets controlling large portions of the EV supply chain. In response, the law aims to limit the role of China and other foreign entities of concern role in the sourcing of EV critical minerals, raw materials, and battery components to the U.S. market. However, the IRA's clean vehicle credit nuances may hinder the EV market at a time when automotive and battery manufacturers are investing billions in the industry. Manufacturers will face challenges in the coming years as they work towards building a domestic chain to meet the Clean Vehicle Credit requirements. Additionally, the complexity of the regulation could lead to confusion and frustration among potential consumers.

### Table 1: Summary of IRA Clean Vehicle Credit Provisions

| | IRA Clean Vehicle Credit of 2022 | |
|---|---|---|
| **Vehicles** | Battery EV<br>Plug-in hybrid EV<br>Hydrogen fuel cell | Previously-owned Vehicles |
| **Maximum Amount** | $7,500<br>$3,750 for vehicles that meet the critical minerals requirement; $3,750 for vehicles that meet the battery component requirement | $4,000<br>Up to 30% of the sale price |
| **Capacity** | 7 kWh & vehicles propelled by fuel cells | -- |
| **Qualifying Restrictions** | After 2024 no credits allowed for vehicles containing critical minerals from foreign entity of concern; after 2023 no battery component sourced from a foreign entity of concern | Previously owned with a model year older than 2 years from sale; First transfer of vehicle; only purchases made at dealerships |
| **Manufacturing Assembly Requirements** | Final assembly must occur in North America (effective 8/16/2022) | -- |
| **Taxpayer Eligibility** | Individuals & businesses | Individuals<br>(One credit every 3 years) |
| **MSRP Caps** | Vans, SUVs, Trucks < $80,00<br>Passengers Vehicles <$55,000 | <$25,000 |
| **Income Limits** | Married <$300,000<br>Head of household <$225,000<br>Individual <$150,000 | Married <$150,000<br>Head of household <$112,500<br>Individual <$75,000 |
| **VIN Reporting Requirements** | Seller must report VIN to treasury; taxpayer must report VIN on tax return | |
| **Transferability** | Taxpayer can transfer credit to dealership | Taxpayer can transfer credit to dealership |
| **Expiration** | 12/31/2032 | 12/31/2032 |

*Source: Inflation Reduction Act of 2022; Congressional Research Service*

# BATTERY SOURCING REQUIREMENTS & CRITICAL MINERAL SPECIFICATIONS

One of the most significant changes in the Clean Vehicle Credits program is the battery sourcing and critical mineral requirements. Under the new provisions, the maximum credit allowed is $7,500 per vehicle, beginning in 2023, with escalating restrictions through 2028 and ending in 2032. There is up to $3,750 available based on eligibility in meeting North American (NA) battery sourcing requirements and up to $3,750 available under the critical mineral requirements for the United States or U.S. Free Trade Agreement (FTA) countries.

Especially noteworthy is the foreign entity of concern rule beginning in 2024. The rule excludes from the credit provisions any vehicle containing battery components from a foreign entity of concern, including China, starting in 2024 and any critical minerals starting in 2025. While other countries are included on that list, it primarily aims at the Chinese electric vehicle supply base.

The new law also stipulates a phase-in period for the percentage of battery components manufactured or assembled in NA. To be eligible for the credits, at least 50 percent of the battery components must be manufactured or assembled in NA for vehicles sold before January 1, 2024. In 2024 and 2025, 60 percent of the battery components must be locally manufactured or assembled. Every year after 2025, the percentage increases by 10 percent until, eventually, after December 31, 2028, 100 percent of the battery components must be manufactured in NA to be eligible for the full EV tax credit.

The critical mineral provision also includes a phase-in period for battery extraction, processing, or recycling to be eligible for the $3,750. For vehicles sold before January 1, 2024, 40 percent of the critical mineral extraction and processing must be in the U.S. or an FTA country. After 2024, the percentage increases by 10 percent until it reaches 80 percent in 2027.

### Table 2: The phase-in time frame for the percentage of battery components and critical minerals originating from NA or an FTA country.

| | Battery Components | Critical Minerals |
|---|---|---|
| 2023 | 50% | 40% |
| 2024 | 60% | 50% |
| 2025 | 60% | 60% |
| 2026 | 70% | 70% |
| 2027 | 80% | 80% |
| 2028 | 90% | 80% |
| 2029 | 100% | 80% |

Battery sourcing content requirements will be difficult for some automakers to meet. The Foreign Entity of Concern rule presents a remarkable challenge. China currently accounts for an impressive majority of processing and refining for critical EV battery minerals. According to the forecasting firm Benchmark Mineral Intelligence [1], 73 percent of cobalt, 93 percent of manganese, 68 percent of nickel, 59 percent of lithium, and nearly 100 percent of graphite are processed and refined in China.

The rapid expansion of localized processing capability may be possible. For example, no automotive grade cathode active material (CAM) plants are currently in production in NA. Cathode materials account for roughly 50 percent of the battery's value (depending on battery chemistry). Tesla may

have an early advantage in developing local processing sources, as they have already applied for permits to construct a CAM plant at its Giga Texas facility in Austin, Texas. The plant is expected to begin CAM production in late 2023 or early 2024. Furthermore, General Motors has announced multiple NA CAM production agreements, which are expected to come online in 2025. Ford has disclosed a nonbinding memorandum of understandings (MOUs) with two suppliers, indicating they will likely be followed with local production. However, no other major automaker or manufacturer has publicly announced plans to build CAM plants in NA. The investment announcements and related production startup suggest that the IRA Clean Vehicle Credits restrictions may make related consumer credits more likely for some manufacturers.

There are areas for optimism in securing a robust battery supply chain in NA and with FTA countries. Although a large percentage of lithium currently originates in Australia—a Free Trade partner—much of it is processed in China. It is possible that the processing of those materials can be shifted away from China, thus easing access. And additional sources are expected to come online during the second half of the decade in the U.S., although reliant partly on new, emerging extraction technologies. Opportunities also exist for Canada and Australia to source additional nickel. Furthermore, recycling offers many opportunities for access to critical material, but since the U.S. is still working on developing a strong EV battery recycling supply chain, sufficient access to feedstock from end-of-life EVs appears some years away.

Regardless of these intriguing opportunities, securing a supply chain that does not include key inputs from China may be challenging. Even if local processing capabilities are developed, companies may struggle to access the needed minerals—many of the mines and resources, regardless of where in the world they are located, are Chinese-owned.

## CONSUMER ELIGIBILITY & INCOME PROVISIONS

Consumer income limits are another major change in the Clean Vehicle Credits. For consumers purchasing a clean vehicle, the law sets an income cap of $150,000 for a single taxpayer, $300,000 for married couples filing jointly, and for individuals who file as head of household, the limit is $225,000. According to analysis by Cox Automotive, approximately 73% of consumers should qualify for new EV purchase incentives based on the income cap [2]. However, the law sets lower income caps for those purchasing a preowned EV, which are $75,000 for an individual, $150,000 for joint returns, and $112,500 for heads of household. Under this provision, approximately 60% of consumers qualify for used clean vehicle purchases [2].

The law intends to incentivize lower-income individuals and families to purchase new and used

clean vehicles by ensuring that low- and moderate-income consumers will benefit most from the tax credits. EVs are generally considered luxury vehicles, and consumers who purchase them are most likely in higher income brackets. These new provisions would eliminate the eligibility of those consumers to qualify for the tax credits. While socially just, the concern is that these income requirements may create further confusion and frustration among consumers, hindering clean vehicle adoption.

# MSRP CAPS

In addition to the battery component requirements, critical material sourcing, and income limits, the IRA Clean Vehicle Credits also sets manufacturer-suggested retail price (MSRP) caps on new and used vehicles. MSRP caps (Figure 1) for new vehicle types may further limit consumer access to clean vehicle credits. According to Kelley Blue Book, the average price of an EV is currently around $66,000, but many models cost more [3]. Only 14 EV models sold in the U.S. would meet the price requirements *(see appendix)*.

### Figure 1. MSRP caps for new vehicles

| Vehicle Type | MSRP Cap |
|---|---|
|  Van | <$80,000 |
|  Sport Utility Vehicles | <$80,000 |
|  Truck | <$80,000 |
|  Passenger Vehicles | <$55,000 |

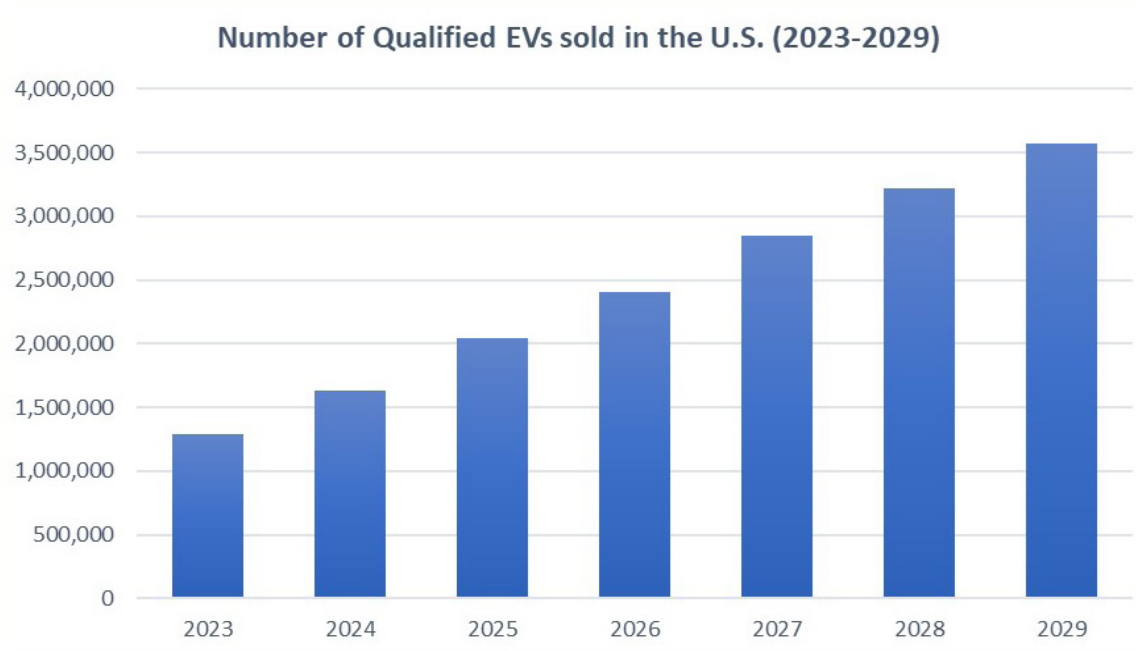
For used vehicles to qualify, the models must be more than two years old and below $25,000. If the used vehicle meets these conditions, the EV tax credit would be worth 30% of the sales price up to $4,000.

The automaker vehicle model mix will likely create further complications under the MSRP limitations. For example, Ford's F-150 Lightning entry-level models are expected to be priced below the $80,000 MSRP cap; however, premium models are likely to exceed the cap and would not qualify. Such complexity will likely confuse consumers and also complicate the profitability outlook for automakers, who have historically relied upon premium models to achieve profitability targets.

# NA VEHICLE ASSEMBLY REQUIREMENTS

Lastly, the IRA Clean Vehicle Credits added a new requirement for final assembly in NA that took effect on August 17, 2022. Several models will not qualify for the tax credit under the NA assembly provisions in IRA. There are currently 30 models of BEVs and PHEVs combined that meet the assembly requirements, while no FCEVs currently qualify.

**Figure 2. The forecasted number of EVs sold in the U.S. that will qualify for Clean Vehicle Credits under the NA Assembly Requirements.**




*Source: IHS Market (S&P Global Mobility)*

As automakers ramp up NA assembly, more and more vehicles will qualify under the IRA. The graph demonstrates the increasing number of vehicles sold in the U.S. that will be eligible for tax credits between 2023 and 2029.

The NA assembly requirement is another element that may disillusion consumers as they look to purchase an EV, only to find out it might not qualify. Since assembly is just one factor, in the near term, few vehicles will qualify under the IRA's Clean Vehicle Credits.

# CONCLUSION

An important aim of the IRA Clean Vehicle Credit provisions is to stimulate the development of domestic battery and clean vehicle supply chains and manufacturing capability. The expectation is that increasing domestic capacity and declining clean vehicle prices spurred by the IRA will increase the number and volume of vehicles eligible for the clean vehicle tax credit in coming years. However, the new law places strict eligibility around battery component and raw material sourcing requirements, MSRP caps, consumer income limits, and NA assembly prerequisites. Taken all together, the credit eligibility criteria could significantly limit the availability and use of clean vehicle credits, at least initially. While many industry stakeholders are concerned that the regulation is overly complex and will confuse buyers, the regulation will most certainly speed the development of the local manufacturing and supply sector.

Automotive and battery manufacturers are feeling the pressure to quickly create a new domestic supply chain while avoiding China and other countries of concern. Building a domestic supply chain is critical for many reasons, including ensuring that sourcing materials for these clean vehicles are reliable, sustainable, and beneficial to the economy and national security. The challenge will be the lead time needed for manufacturers to extract minerals, build batteries, and develop a domestic supply chain for materials, which can take several years. Therefore, in many cases, it will likely take years before consumers will be able to receive the IRA's Clean Vehicle Credits.

# REFERENCES

[1] Inflation Reduction Act puts OEM raw material supply deals in focus | Benchmark Minerals Intelligence. (2022).

[2] Cox Automotive Analysis, 2022

[3] Average New Car Price Hits Another Record, Kelly Blue Book. (2022).

# APPENDIX

When considering MSRP, these are the current and upcoming models made in NA with versions that cost less than the bill requires:

| |
|---|
| Cadillac Lyriq (only if it is classified as an SUV) |
| Chevrolet Blazer EV |
| Chevrolet Bolt |
| Chevrolet Bolt EUV |
| Chevrolet Silverado EV (with certain options and trim levels) |
| Ford F-150 Lightning (with certain options and trim levels) |
| Ford Mustang Mach-E |
| Nissan Leaf |
| Rivian R1S (with certain options and trim levels) |
| Rivian R1T (with certain options and trim levels) |
| Tesla Cybertruck (with certain options and trim levels) |
| Tesla Model 3 (with certain options and trim levels) |
| Tesla Model Y (only if it is classified as an SUV, and only with certain options and trim levels) |
| Volkswagen ID.4 (only 2023+ models made in Tennessee) |

*Source: Consumer Reports*