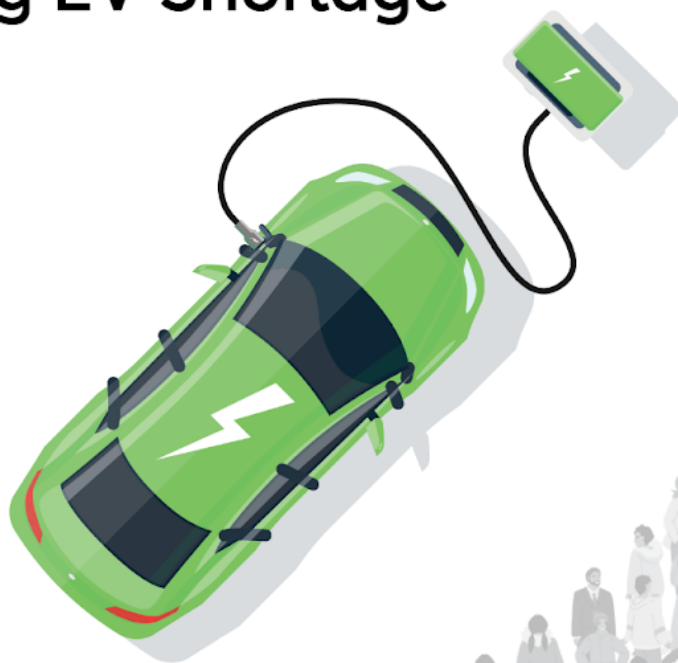


# Excess Demand

## The Looming EV Shortage

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MARCH 2023



## Executive Summary

Consumer Reports (CR) surveys have shown a 350% increase in consumer demand for battery electric vehicles (BEVs) between 2020 and 2022. While automakers are ramping up supply, the fact that the vehicle fleet turns over very slowly means that most consumers will have to wait a decade or more for an opportunity to own a BEV.

For consumers who said in our 2022 survey that they would “definitely buy or lease” a BEV if they were to get a vehicle today, demand is unlikely to be met until at least the end of the decade on the current supply trajectory—and a virtuous cycle is shaping up that appears poised to rapidly increase consumer demand even further in coming years. This rising tide of demand is projected to be met by lagging supply, leaving many consumers who want a BEV to choose between settling for a gasoline vehicle they don’t want, joining an ever-expanding waitlist, or just waiting it out and holding onto their existing vehicle for longer.

Automakers that are too slow to move may find themselves struggling to find buyers for all of the conventional gasoline vehicles they currently plan to build as they simultaneously attempt to catch up with accelerating BEV demand. Failure to respond quickly enough to rapid shifts in consumer preferences will pose significant risks to legacy automakers, and the risk of being too late may prove much greater than the risk of being too early. Regulators have an opportunity with the establishment of new emissions and efficiency standards to ensure that the industry stays on a trajectory that doesn’t leave consumers waiting.

## Rapidly Growing Consumer Demand For Battery-Electric Vehicles

More and more consumers are coming around to the compelling value proposition offered by many battery-electric vehicles (BEVs) on the market today. They are fun to drive, have smooth and quiet power delivery, and have lower fuel and maintenance costs. They can even be cheaper to own in many cases, even when they cost more to buy up front.<sup>1</sup>

In a 2022 survey, CR asked U.S. consumers how likely they were to get an electric-only vehicle if they were purchasing or leasing a vehicle today.<sup>2</sup> In response, 71% of American adults said they had at least some interest in owning one. Of that group, 14% said they would “definitely buy or lease” a BEV if they were to buy a vehicle today.<sup>3</sup> Another 22% said they would “seriously consider” it, and another 35% said they might consider a BEV in the future but aren’t ready to buy one today. (Figure 1 shows the full breakdown of responses.)

**“ There are now approximately 45 EV-ready buyers for every EV being manufactured. ”**

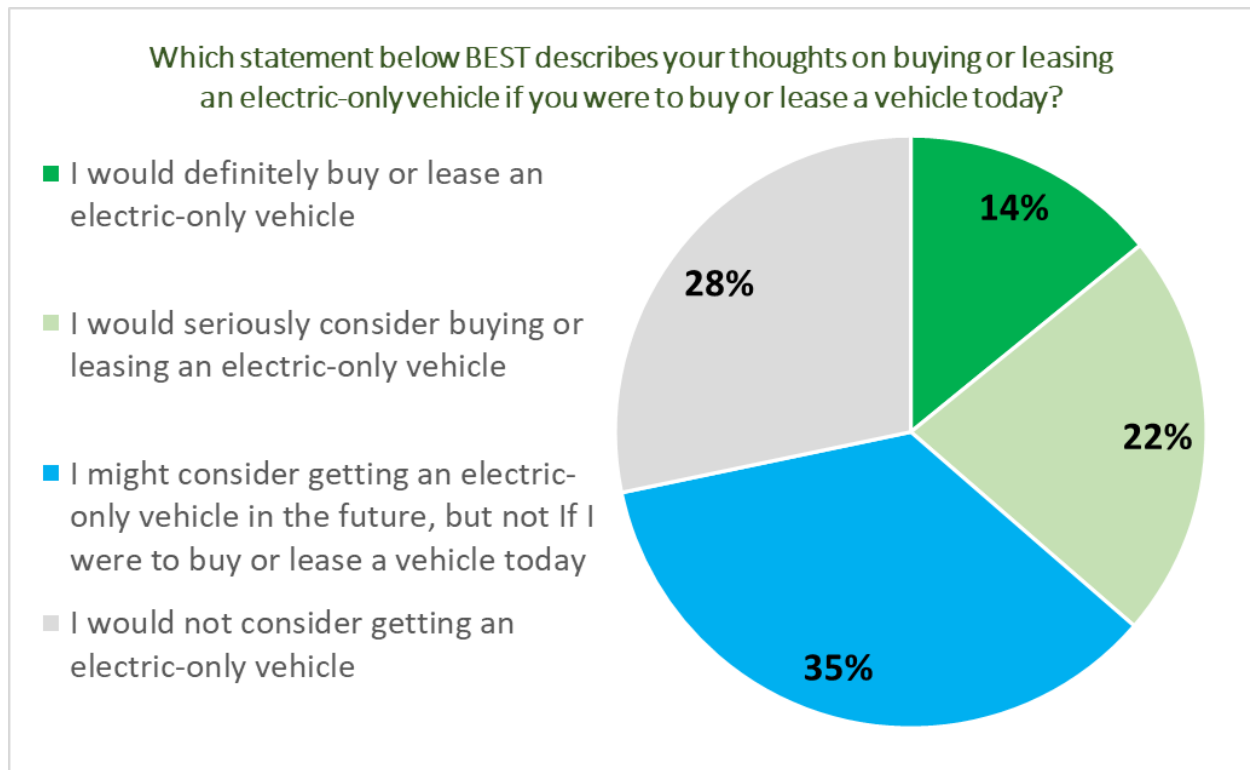
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<sup>1</sup> Consumer Reports, “Electric Vehicle Ownership Costs: Today’s Electric Vehicles Offer Big Savings for Consumers” October 2020  
<https://advocacy.consumerreports.org/wp-content/uploads/2020/10/EV-Ownership-Cost-Final-Report-1.pdf>

<sup>2</sup> An electric-only vehicle is a vehicle that can only be fueled by electricity, otherwise known as a battery electric vehicle or BEV. This is in contrast to a plug-in hybrid vehicle or PHEV, which can be fueled by either electricity or gasoline.

<sup>3</sup> Nationally representative CR survey of 8,027 US adults conducted in January and February 2022. Consumer Reports, “Battery Electric Vehicles & Low Carbon Fuels Survey”, April 2022. Available at: [https://article.images.consumerreports.org/image/upload/v1657127210/prod/content/dam/CRO-Images-2022/Cars/07July/2022\\_Consumer\\_Reports\\_BEV\\_and\\_LCF\\_Survey\\_Report.pdf](https://article.images.consumerreports.org/image/upload/v1657127210/prod/content/dam/CRO-Images-2022/Cars/07July/2022_Consumer_Reports_BEV_and_LCF_Survey_Report.pdf)

**Figure 1. Likelihood of Buying or Leasing an Electric-Only Vehicle Today**



Some additional context is helpful to fully appreciate what these numbers mean for the U.S. auto market. The 14% of adult Americans who said they would “definitely buy” an electric-only vehicle in our 2022 survey represents approximately 36 million “EV-ready” buyers.<sup>4</sup> That’s an increase of some 28 million, or 350%, since 2020.<sup>5</sup>

Meanwhile, despite a 230% increase, from 240,000 in 2020, the annual supply of BEVs in 2022 was only 800,000 per year.<sup>6</sup> The end result is that BEV supply is significantly further behind demand than it was two years ago. There are now approximately 45 EV-ready buyers for every EV being manufactured.

This explains why waitlists for the hottest EVs are being measured in years. A 2022 analysis by Seattle-based startup Recurrent found that an estimated 1.9 million Americans have paid a

<sup>4</sup> Calculated by multiplying 14% by the US adult population 258 million according to: <https://www.census.gov/library/stories/2021/08/united-states-adult-population-grew-faster-than-nations-total-population-from-2010-to-2020.html>.

<sup>5</sup> Based on 4% of Americans with drivers licenses who said they would “definitely buy” an electric vehicle in a Nationally representative CR survey of 3,392 US adults with valid driver’s licenses in July and August 2020.

Consumer Reports, “Consumer Interest and Knowledge of Electric Vehicles: 2020 Survey Results,” December 2020. Available at: <https://advocacy.consumerreports.org/wp-content/uploads/2020/12/CR-National-EV-Survey-December-20-2.pdf>

<sup>6</sup> Consumer Reports analysis of Wards Intelligence annual sales data, available with subscription at: <https://wardsintelligence.informa.com/datacenter>

deposit to reserve one of eleven popular EVs.<sup>7</sup> Even more customers are waiting to purchase one of the many other models that don't have formal waitlists, but do have order backlogs.

### **The Current BEV Supply Trajectory Will Leave Consumers Waiting**

The current BEV supply trajectory does not improve the outlook for consumers hoping to get their hands on a battery-electric vehicle. Not only are new BEV sales failing to keep up with consumer demand, the slow turnover of the vehicle fleet means that even when supply catches up, it will take a long time to clear the backlog of demand.<sup>8</sup>

To explore this dynamic, two different BEV supply trajectories were input into a simplified fleet turnover model to estimate the rate of BEV penetration into the light duty vehicle stock.

The first scenario, referred to as the “GM-Scenario” is based loosely on the BEV sales plans of General Motors, which currently has one of the most aggressive long-term BEV expansion plans among major automakers. That supply scenario assumes 50% BEV sales in 2030, which is at the top of GM's stated 2030 sales target range, and 100% BEV sales in 2035.<sup>9</sup> Figure 2 shows how this supply trajectory would impact the percentage of BEVs in the entire U.S. light-duty vehicle fleet over time.

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<sup>7</sup> Based on an analysis of public information about EV registrations and pre-orders by Recurant. Recurrent, “Everything to Know About EV Reservations & Pre-orders,” June 11, 2022. Available at: <https://www.recurrentauto.com/research/ev-reservations-pre-orders>

<sup>8</sup> David Keith, et. al. (2019). *Vehicle Fleet Turnover and the Future of Fuel Economy*, Environmental Research Letters, 14, 021001. Available at:

<https://iopscience.iop.org/article/10.1088/1748-9326/aaf4d2#erlaaf4d2s1>

<sup>9</sup> The “GM-Scenario” assumes 17% BEV sales in 2026 based upon the percentage of EVs estimated by EPA to be needed to comply with greenhouse standards for model year 2026. Supply then grows to 50% in 2030 to match the top of GM's planned production range for this year. Finally BEV supply continues to grow to 100% of new vehicle sales in 2035, GM's target for that year. The full new vehicle sales trajectory for this scenario can be seen in Figure 3.

EPA, “EPA Finalizes Greenhouse Gas Standards for Passenger Vehicles, Paving Way for a Zero-Emissions Future,” December 20, 2021. Available at: <https://www.epa.gov/newsreleases/epa-finalizes-greenhouse-gas-standards-passenger-vehicles-paving-way-zero-emissions>

General Motors, “Ford, GM and Stellantis Joint Statement on Electric Vehicle Annual Sales,” Available at: <https://news.gm.com/newsroom.detail.html/Pages/news/us/en/2021/aug/0805-electric.html>

General Motors, “General Motors, the Largest U.S. Automaker, Plans to be Carbon Neutral by 2040,” Available at: <https://news.gm.com/newsroom.detail.html/Pages/news/us/en/2021/jan/0128-carbon.html>

**Figure 2. Modeled BEV Penetration into the US Vehicle Fleet Through 2050 Assuming the GM-Scenario for BEV Sales<sup>10</sup>**

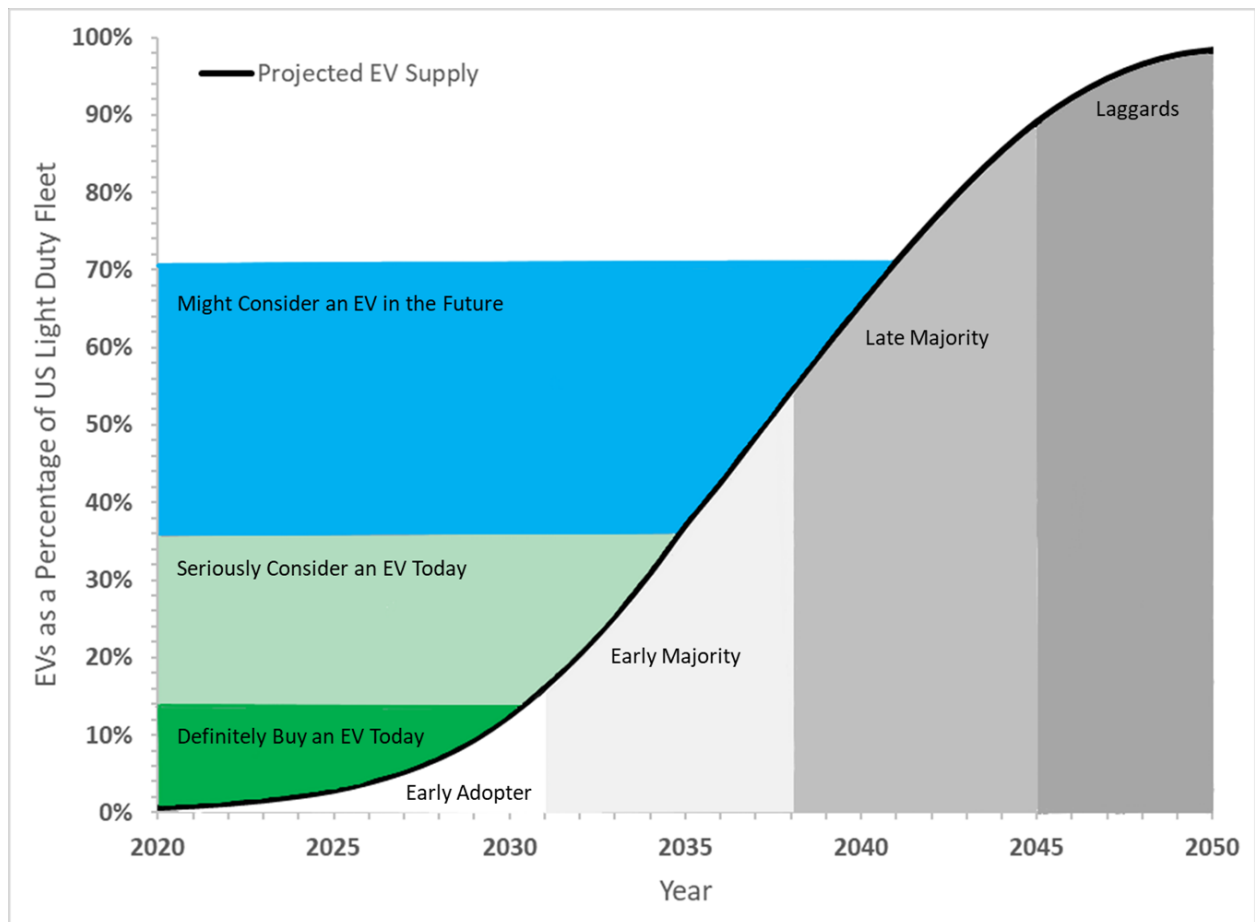


Figure 2 also includes survey data from Figure 1 showing when different levels of current demand are likely to be satisfied along this supply trajectory.<sup>11</sup> The plot shows that it will take until around 2030 before there is enough supply for all consumers who said in 2022 they would “definitely buy or lease an electric-only vehicle today.” Even in 2035, when new sales would be 100% electric under this scenario, supply would only be sufficient for all of the consumers who are currently “seriously considering” a BEV to buy one. The consumers who “might consider getting an electric-only vehicle in the future” will likely have to wait a long time for that

<sup>10</sup> Consumer demand percentages are based upon results from the Nationally representative CR survey of 8,027 US adults conducted in January and February 2022. Consumer Reports, “Battery Electric Vehicles & Low Carbon Fuels Survey”, April 2022. Available at: [https://article.images.consumerreports.org/image/upload/v1657127210/prod/content/dam/CRO-Images-2022/Cars/07July/2022\\_Consumer\\_Reports\\_BEV\\_and\\_LCF\\_Survey\\_Report.pdf](https://article.images.consumerreports.org/image/upload/v1657127210/prod/content/dam/CRO-Images-2022/Cars/07July/2022_Consumer_Reports_BEV_and_LCF_Survey_Report.pdf)

<sup>11</sup> Nationally representative CR survey of 8,027 US adults conducted in January and February 2022. Consumer Reports, “Battery Electric Vehicles & Low Carbon Fuels Survey”, April 2022. Available at: [https://article.images.consumerreports.org/image/upload/v1657127210/prod/content/dam/CRO-Images-2022/Cars/07July/2022\\_Consumer\\_Reports\\_BEV\\_and\\_LCF\\_Survey\\_Report.pdf](https://article.images.consumerreports.org/image/upload/v1657127210/prod/content/dam/CRO-Images-2022/Cars/07July/2022_Consumer_Reports_BEV_and_LCF_Survey_Report.pdf)

opportunity, as there won't be enough supply for them to even start owning BEVs until after 2035.

The plot also includes the key stages of the textbook diffusion of innovation model,<sup>12</sup> which describes how new technologies typically spread through society. It is characterized by five key stages:<sup>13</sup>

- 1) Innovators (2.5%)<sup>14</sup> - These are the earliest adopters who typically have a high risk tolerance and financial resources to absorb failures.
- 2) Early Adopters (13.5%) - The next adopters, typically younger, better educated and wealthier than average.
- 3) Early Majority (34%) - This group typically requires evidence that a technology works before adopting it.
- 4) Late Majority (34%) - This group tends to be skeptical of new technology and waits to adopt it until it has been proven to work and it has been adopted by the majority of the population.
- 5) Laggards (16%) - This group is very conservative with a strong aversion to change.

Figure 2 shows that on the modeled trajectory the market won't even leave the "early adopter" phase until around 2031, and demand for the "early majority" and "late majority" would not be satisfied until 2038 and 2045, respectively. So-called "laggards" won't become relevant to the market on this trajectory until the mid 2040s.

Of course, the GM-scenario supply trajectory modeled in Figure 2 is not the only possible trajectory for BEV adoption. For example, California has set zero-emissions vehicle (ZEV) standards, otherwise known as Advanced Clean Cars II (ACCII), that result in a more aggressive trajectory than the GM-scenario modeled above.<sup>15</sup> ACCII calls for achieving 68% ZEV sales by 2030.<sup>16</sup> This trajectory, assuming all ZEV sales are BEVs, is more in line with what has been observed in other countries that have exceeded 5% BEV sales, which has been a key tipping point in other markets around the world, according to a Bloomberg analysis of adoption

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<sup>12</sup> On Digital Marketing, "The 5 Customer Segments of Technology," Available at: <https://ondigitalmarketing.com/learn/odm/foundations/5-customer-segments-technology-adoption/> and

Boston University School of Public Health, "Diffusion of Innovation Theory," Available at: <https://sphweb.bumc.bu.edu/otlt/mph-modules/sb/behavioralchangetheories/behavioralchangetheories4.html>

<sup>13</sup> Each stage of adoption is associated with a specific percentage of the population, shown in parentheses below, based on the assumption of a normal distribution around the average time it takes for a population to adopt a specific technology.

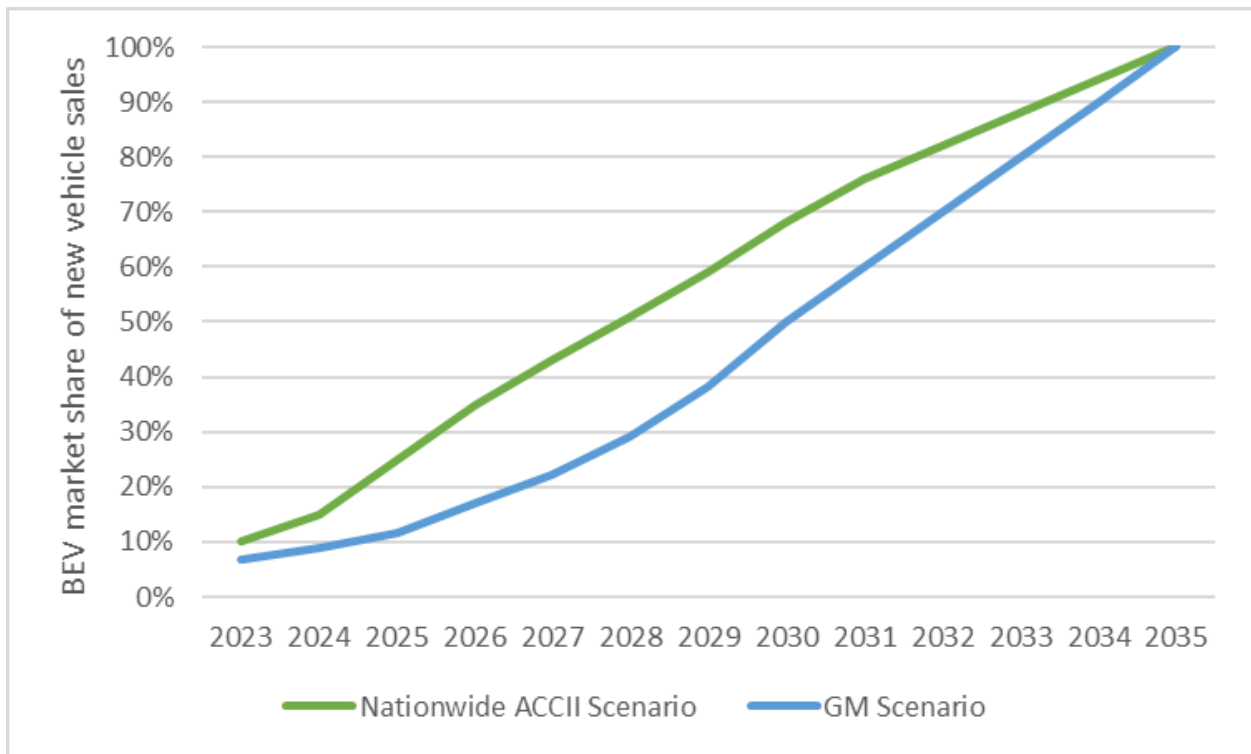
<sup>14</sup> Combined with the early adopters on the graph

<sup>15</sup> California Air Resources Board, "Advanced Clean Cars II Regulations: All New Passenger Vehicles Sold in California to be Zero Emissions by 2035" Available at: <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/advanced-clean-cars-ii>

<sup>16</sup> California defines zero emission vehicles to include BEVs, fuel cell electric vehicles, and up to 20% plug in hybrid electric vehicles.

rates.<sup>17</sup> If BEV supply nationwide were to accelerate to match the ACCII standards by 2026 and follow them to 2035, BEV penetration into the vehicle fleet could be accelerated by around two years, reducing the wait time for many consumers.<sup>18</sup> This accelerated BEV sales scenario—“Nationwide ACCII”)—is illustrated in Figure 3 compared to the GM scenario that was modeled in Figure 2.

**Figure 3. Comparison of New BEV Sales Scenarios**



<sup>17</sup> Bloomberg, “US Crosses the Electric-Car Tipping Point for Mass Adoption,” July 9, 2022. Available at: <https://www.bloomberg.com/news/articles/2022-07-09/us-electric-car-sales-reach-key-milestone?smd=green&sref=JN1HDH2Z>

<sup>18</sup> For example demand for early adopters would be satisfied by 2029 and the early majority by 2036.



## A Virtuous Cycle

Four major trends make EV demand likely to grow far more quickly than EV supply: cost declines, improved infrastructure, increased consumer experience, and increased automaker investments. These trends tend to reinforce one another in a virtuous cycle. Here we'll examine them and their respective places in this dynamic one at a time.

### Cost declines

Initial purchase cost is currently one of the top barriers to BEV ownership.<sup>19</sup> Yet a combination of technological advancements, automaker efficiencies, economies of scale, and government tax incentives are helping to drive down the costs of BEVs. Many auto industry analysts and observers have estimated that cost parity between BEVs and conventional gasoline vehicles will be achieved sometime this decade. Recent analysis from the International Council on Clean Transportation (ICCT) estimated that even without any tax incentives, BEVs with 300 miles of range per charge will achieve cost parity in all light-duty vehicle classes before 2030.<sup>20</sup>

What's more, the recently passed Inflation Reduction Act will offer tax credits of up to \$7,500 for the purchase of new BEVs that meet certain manufacturing, vehicle pricing, buyer income, and critical minerals requirements.<sup>21</sup> A separate study from the ICCT estimated that these tax credits would make the average new BEV cheaper than the average new conventional vehicle as soon as 2023 and no later than 2025, resulting in a large boost in BEV demand.<sup>22</sup>

### Improved infrastructure

A major barrier to BEV adoption is the lack of widespread, reliable charging infrastructure.<sup>23</sup> The Bipartisan Infrastructure Law provided \$7.5 billion to help deploy BEV charging infrastructure throughout the country.<sup>24</sup> Also, as more BEVs are sold, there will be more demand for

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<sup>19</sup> Nationally representative CR survey of 8,027 US adults conducted in January and February 2022. Consumer Reports, "Battery Electric Vehicles & Low Carbon Fuels Survey", April 2022. Available at: [https://article.images.consumerreports.org/image/upload/v1657127210/prod/content/dam/CRO-Images-2022/Cars/07July/2022\\_Consumer\\_Reports\\_BEV\\_and\\_LCF\\_Survey\\_Report.pdf](https://article.images.consumerreports.org/image/upload/v1657127210/prod/content/dam/CRO-Images-2022/Cars/07July/2022_Consumer_Reports_BEV_and_LCF_Survey_Report.pdf)

<sup>20</sup> Peter Slowik, et al. "Assessment of Light-Duty Vehicle Cost and Consumer Benefits In the United States in the 2022-2035 Timeframe," The International Council on Clean Transportation, October 2022. Available at: <https://theicct.org/wp-content/uploads/2022/10/ev-cost-benefits-2035-oct22.pdf>

<sup>21</sup> Consumer Reports, "More SUVs, Teslas Now Qualify for the New Electric Vehicle Tax Credit," February 9, 2023. Available at: <https://www.consumerreports.org/cars/hybrids-evs/electric-vehicles-that-qualify-for-new-ev-tax-credit-a9310530660/>

<sup>22</sup> Peter Slowik et al. "Analyzing the Impact of the Inflation Reduction Act on Electric Vehicles Uptake in the United States," The International Council on Clean Transportation, January 2023. Available at: <https://theicct.org/wp-content/uploads/2023/01/ira-impact-evs-us-jan23-2.pdf>

<sup>23</sup> Nationally representative CR survey of 8,027 US adults conducted in January and February 2022. Consumer Reports, "Battery Electric Vehicles & Low Carbon Fuels Survey", April 2022. Available at: [https://article.images.consumerreports.org/image/upload/v1657127210/prod/content/dam/CRO-Images-2022/Cars/07July/2022\\_Consumer\\_Reports\\_BEV\\_and\\_LCF\\_Survey\\_Report.pdf](https://article.images.consumerreports.org/image/upload/v1657127210/prod/content/dam/CRO-Images-2022/Cars/07July/2022_Consumer_Reports_BEV_and_LCF_Survey_Report.pdf)

<sup>24</sup> ZETA, "The Final Rules: National Electric Vehicle Infrastructure Formula Program Summary," Available at: <https://www.zeta2030.org/insights/nevi-final-rule-summary>

infrastructure—and more revenue generated by it—which will likely help catalyze further private investment.

Furthermore, private corporations are beginning to see the opportunity that EV charging can provide. By installing chargers, businesses can influence where consumers spend their time (and money) while they wait for their vehicles to charge. For example, Starbucks is partnering with Volvo and ChargePoint to install fast chargers at 15 locations between Denver and Seattle.<sup>25</sup> Subway and GenZ EV Solutions are partnering to develop charging parks equipped with picnic tables, wifi,, bathrooms, and playgrounds near some of Subway's locations.<sup>26</sup> As consumers become more confident in the availability and reliability of the charging network, their interest in purchasing a BEV is likely to increase.

### **Increased consumer experience**

Direct experience with BEVs is one of the strongest drivers of purchase interest. This is illustrated in Figure 4, in which the three pie graphs represent low, medium, and high levels of experience with battery electric vehicles.<sup>27</sup> CR found that consumers with the most direct experience were almost ten times as likely to say they would “definitely buy” an electric vehicle today as consumers with no direct experience (58% vs 6%).<sup>28</sup> More BEVs on the road means more opportunities for Americans to gain more direct experience and exposure to BEVs. Right now, broad consumer experience with BEVs is very limited, but that is likely to change as more people see family, friends, and neighbors bring home their first battery electric vehicle.

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<sup>25</sup> Starbucks, “Find an EV Charger at Starbucks stores from Seattle to Denver,” August 9, 2022. Available at:

<https://stories.starbucks.com/stories/2022/find-an-ev-charger-at-starbucks-stores-from-seattle-to-denver/>

<sup>26</sup> Subway, “Subway Enhances Guest Experience with Plans to Add Electric Vehicle Charging Oasis Parks,” February 21, 2023. Available at: <https://newsroom.subway.com/2023-02-21-Subway-Restaurants>

<sup>27</sup> Nationally representative CR survey of 8,027 US adults conducted in January and February 2022.

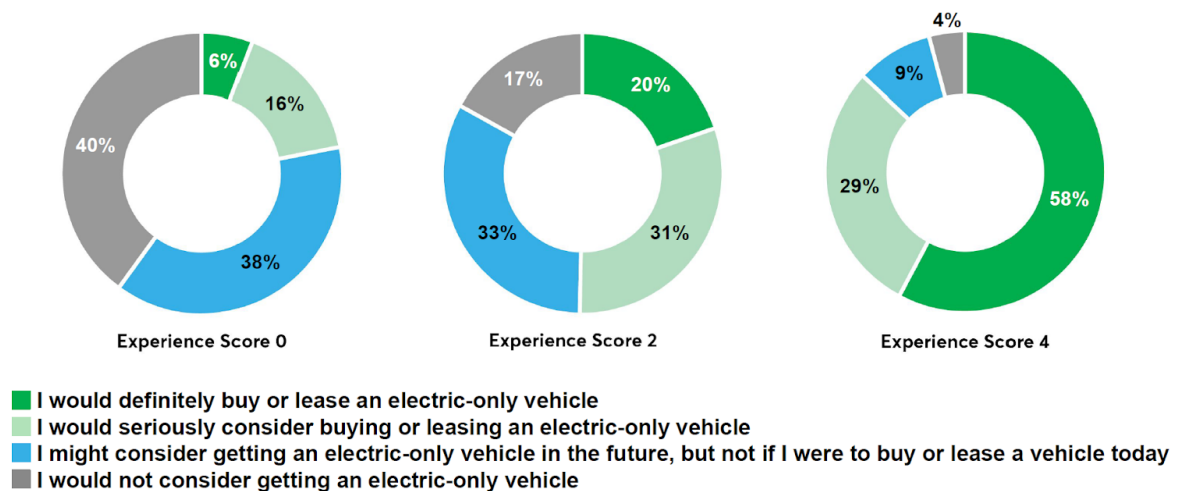
Consumer Reports, “Battery Electric Vehicles & Low Carbon Fuels Survey”, April 2022. Available at: [https://article.images.consumerreports.org/image/upload/v1657127210/prod/content/dam/CRO-Images-2022/Cars/07July/2022\\_Consumer\\_Reports\\_BEV\\_and\\_LCF\\_Survey\\_Report.pdf](https://article.images.consumerreports.org/image/upload/v1657127210/prod/content/dam/CRO-Images-2022/Cars/07July/2022_Consumer_Reports_BEV_and_LCF_Survey_Report.pdf)

<sup>28</sup> Experience was measured based upon “yes” answers to four different questions:

- 1) Have you seen an EV in your neighborhood in the past month
- 2) Do you know someone with an EV
- 3) Have you been a passenger in an EV in the past year
- 4) Have you driven an EV in the past year

**Figure 4. Survey Results on BEV Demand by Experience with BEVs**

Which Statement below BEST describes your thoughts on buying or leasing an electric-only vehicle if you were to buy or lease a vehicle today?



### Increased automaker investments

Finally, as purchase interest goes up, automakers are likely to respond by delivering more electric options, in more vehicle classes, and at more price points. We’re already seeing significant growth in the number of BEV models that will become available to consumers over the next few years.<sup>29</sup> Many automakers have also significantly boosted their long term BEV commitments in recent years, and it seems likely that more will follow suit.<sup>30</sup> As of January 2023, automakers and battery makers plan to invest \$860B in the transition to EVs by 2030, including \$210B in the U.S, according to an analysis by Atlas Public Policy.<sup>31</sup> As automakers deliver more volume, economies of scale and intensified competition for customers will further feed cost declines, which will feed back into the cycle and lead to increased BEV demand.

<sup>29</sup> Consumer Reports, “Hot, New Electric Cars That Are Coming Soon,” March 15, 2023. Available at: <https://www.consumerreports.org/cars/hybrids-evs/hot-new-electric-cars-are-coming-soon-a1000197429/>

<sup>30</sup> Consumer Reports, “Automakers Are Adding Electric Vehicles to Their Lineups. Here’s What’s Coming.” March 10, 2023. Available at: <https://www.consumerreports.org/cars/hybrids-evs/why-electric-cars-may-soon-flood-the-us-market-a9006292675/>

<sup>31</sup> Atlas EV Hub, “\$210 Billion of Announced Investments in Electric Vehicle Manufacturing Headed for the U.S.” January 12, 2023. Available at: [https://www.atlasevhub.com/data\\_story/210-billion-of-announced-investments-in-electric-vehicle-manufacturing-headed-for-the-u-s/](https://www.atlasevhub.com/data_story/210-billion-of-announced-investments-in-electric-vehicle-manufacturing-headed-for-the-u-s/)

## Significant Risk to Automakers from Moving Too Slowly

The continuation of this virtuous cycle, however, is not assured. Consumers cannot buy vehicles that automakers don't build, so it is critical that automakers rapidly scale up BEV production to keep pace with growing demand. It remains unclear how consumers will respond if the supply of BEVs is insufficient to meet their demand. And it may prove disastrous for automakers to assume that consumers will buy whatever they build: CR's car buying survey from March and April 2022 found that 30% of licensed drivers who were then in the market to buy or lease a new (and not a used) vehicle were not even considering a conventional, non-hybrid vehicle.<sup>32</sup> Given the demand dynamics discussed above, it seems unlikely that this number will stop growing anytime soon.

**“ 30% of licensed drivers who were then in the market to buy or lease a new (and not a used) vehicle were not even considering a conventional, non-hybrid vehicle. ”**

While this rapidly growing segment of consumers often cross-shops between battery-electric vehicles, plug-in hybrids, and hybrids, they no longer seem willing to settle for conventional internal combustion engine (ICE) vehicles—and may decide to put off their purchase rather than settle for one. In fact, the Osborne Effect is a well-documented phenomenon, in which consumers forgo the purchase of a soon-to-be-obsolete item while waiting for a newer and better version to become available.<sup>33</sup> Indeed, the long waitlists discussed above indicate that many buyers are already willing to wait years to get the vehicle they really want. Automakers may be able to entice some of these consumers to buy conventional gasoline vehicles, but doing so is likely to require discounting and may threaten profitability. Ultimately there are serious risks to automakers that fail to respond quickly to rapid growth in consumer demand for BEVs.

Analysis of sales data over the past few years further suggests that demand for ICE vehicles is already declining precipitously. Figure 5 shows annual U.S. light duty vehicle sales by powertrain type from 2018-2022. Sales of new ICE vehicles dropped by 26% from 2019 to 2022, while combined sales of BEVs, plug-in hybrid vehicles (PHEVs) and conventional hybrids increased by 144%. BEV sales alone increased by 244%.<sup>34</sup>

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<sup>32</sup> Consumer Reports, “Car Buying: A National Representative Multi-Mode Survey, 2022 Results,” May 2022. Available at: [https://article.images.consumerreports.org/prod/content/dam/surveys/Consumer\\_Reports\\_Car\\_Buying\\_March\\_2022.pdf](https://article.images.consumerreports.org/prod/content/dam/surveys/Consumer_Reports_Car_Buying_March_2022.pdf).

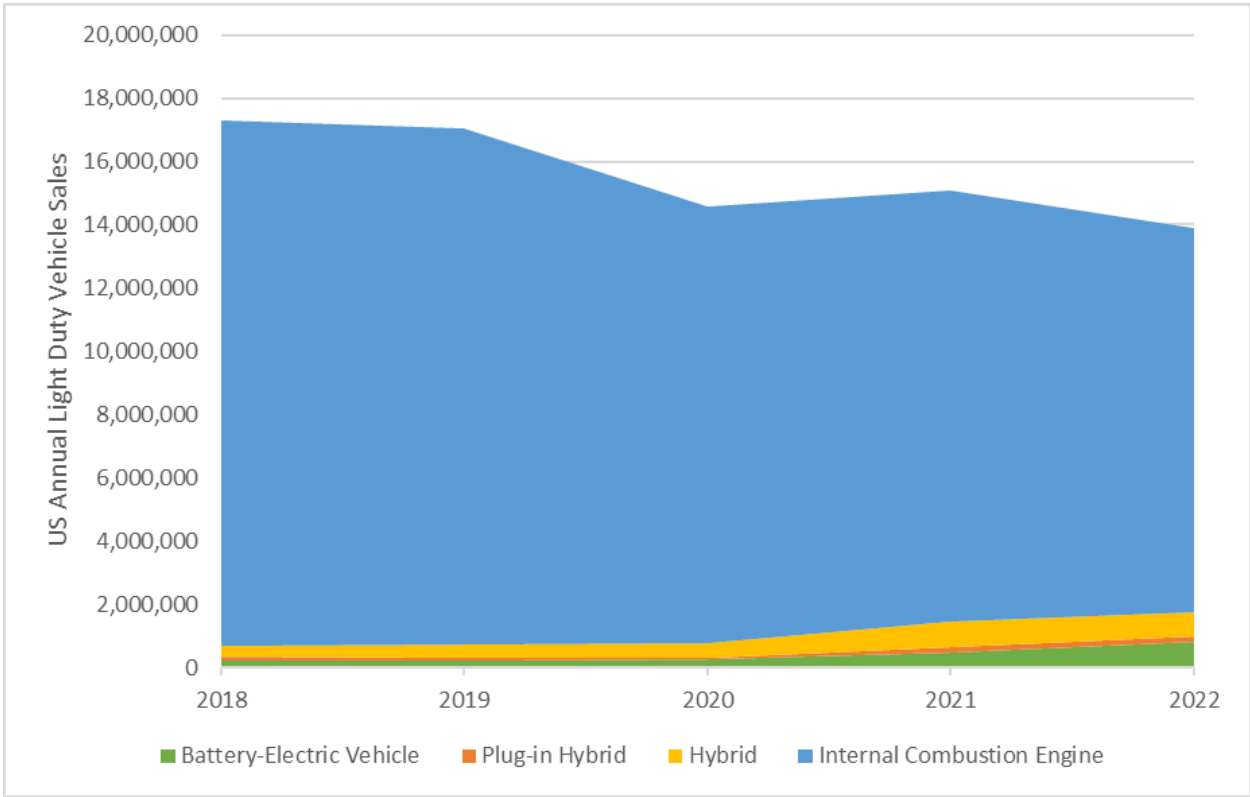
<sup>33</sup> Center for Computing History, “Osborne 1,” available at: <https://www.computinghistory.org.uk/det/504/osborne-1/>

<sup>34</sup> Consumer Reports analysis of Wards Intelligence annual sales data, available with subscription at: <https://wardsintelligence.informa.com/datacenter>

What’s more, the increase in BEV, PHEV and hybrid sales did not even come close to offsetting the decline in ICE vehicle sales. Cumulative ICE vehicle sales between 2020 and 2022 fell by 9.4 million compared to the 2019 rate, while cumulative sales of BEVs, PHEVs, and hybrids increased by only 1.8 million.<sup>35</sup>

It is impossible to determine what percentage of the reduction in ICE vehicle sales should be attributed to reduced demand vs. what percent are due to supply chain disruptions caused by the COVID-19 pandemic. However, pandemic-related supply chain issues have now largely been resolved, so the picture should soon become clear. Recent data showing both depressed sales of ICE vehicles and rapidly rising dealer inventories suggests that consumer demand for conventional vehicles is unlikely to rebound to prior levels.<sup>36</sup> As automakers seek to recover from pandemic related disruptions, they would be wise to focus their attention on boosting production of their more sustainable BEV, PHEV, and hybrid offerings.

**Figure 5. US Light Duty Vehicle Sales by Powertrain Type 2018-2022**



<sup>35</sup> Consumer Reports analysis of Wards Intelligence annual sales data, available with subscription at: <https://wardsintelligence.informa.com/datacenter>

<sup>36</sup> A total of 730,000 more vehicles were manufactured than sold between February 2023 and February 2022. <https://www.coxautoinc.com/market-insights/new-vehicle-inventory-february-2023/>

## Time to Hit the Accelerator

The data point to one conclusion: it is time for both automakers and regulators to hit the accelerator on BEVs. Automakers have, at times, ignored market signals and done the bare minimum required of them by regulators.<sup>37</sup> The federal government, using the Environmental Protection Agency greenhouse gas standards and the National Highway Traffic Safety Administration corporate average fuel economy regulations, has an opportunity to help ensure that the industry stays on track, and doesn't fall too far behind rapidly growing consumer demand.

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<sup>37</sup> Consumer Reports, "EPA Trends Report Shows Automakers Failed To Deliver Fuel Economy Gains Between Model Years 2020 and 2021," December 12, 2022. Available at: [https://advocacy.consumerreports.org/press\\_release/epa-trends-report-shows-automakers-failed-to-deliver-fuel-economy-gains-between-model-years-2020-and-2021](https://advocacy.consumerreports.org/press_release/epa-trends-report-shows-automakers-failed-to-deliver-fuel-economy-gains-between-model-years-2020-and-2021).