

The Future of Electric Vehicles: A Glimpse into 2050

[What 2050 EV will be like?](#)

**BEV (Battery Electric Vehicle)
will dominate the future market.**



What 2050 EV will be like?

BEV (Battery Electric Vehicle) will dominate the future market.

1. Alignment with regulation

BEV is aligned with both Paris Agreement and US Environmental Protection Agency.

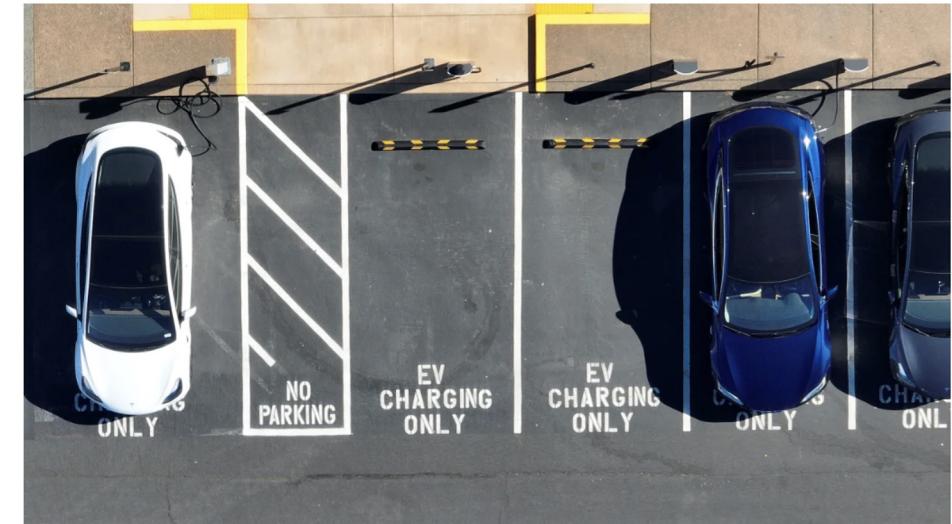
2. Growing significance

3. Sustainability

4. Cost effectiveness

EPA proposes new tailpipe rules that could push EVs to make up two-thirds of new car sales in US by 2032

By Ella Nilsen, CNN
Updated 11:01 AM EDT, Wed April 12, 2023



Justin Sullivan/Getty Images

Tesla cars recharge in Corte Madera, California.

(CNN) — The Environmental Protection Agency on Wednesday proposed ambitious new car pollution rules that could require electric vehicles to account for up to two-thirds of new cars sold in the US by 2032, in what would be one of the Biden administration's most aggressive climate-change policies yet.

The tailpipe standards would also have the effect of cutting planet-warming pollution from cars in half. Transportation accounts for nearly 30% of all greenhouse gas emissions in the US, according to the EPA.

EPA Administrator Michael Regan called the regulations "the strongest-ever federal pollution standards for cars and trucks."

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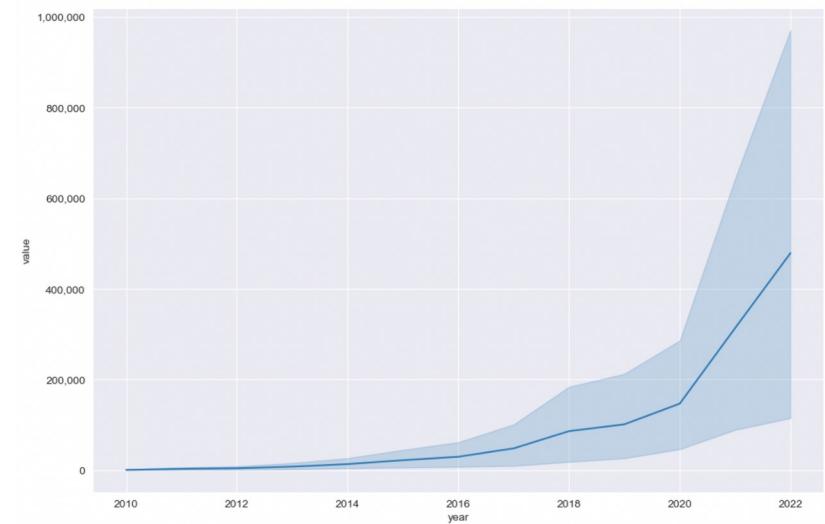
2. Growing significance

We can observe a rapid increase in EV sales since 2020, and this trend is expected to continue with even higher sales numbers in the future.

3. Sustainability

4. Cost effectiveness

EV market sales since 2020



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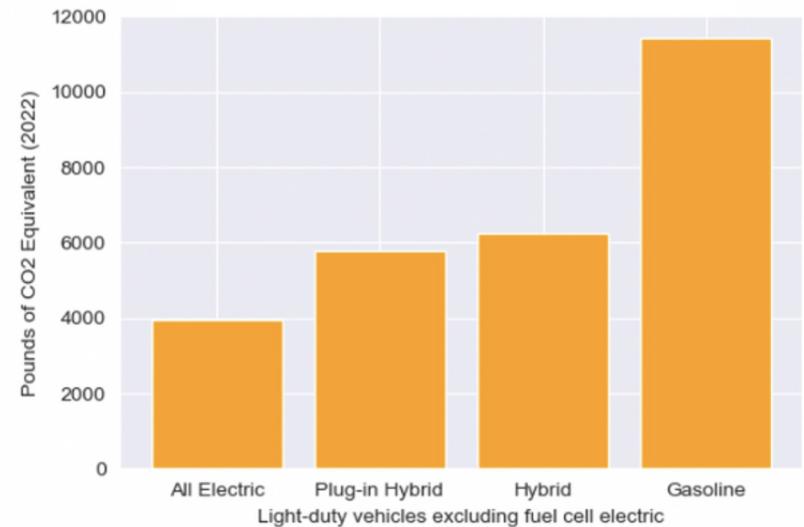
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By utilizing the data provided by the U.S. Department of Energy, the bar chart illustrates that EVs generate the lowest amount of CO₂ equivalent per year.

4. Cost effectiveness

CO₂ Emissions from different types of vehicles



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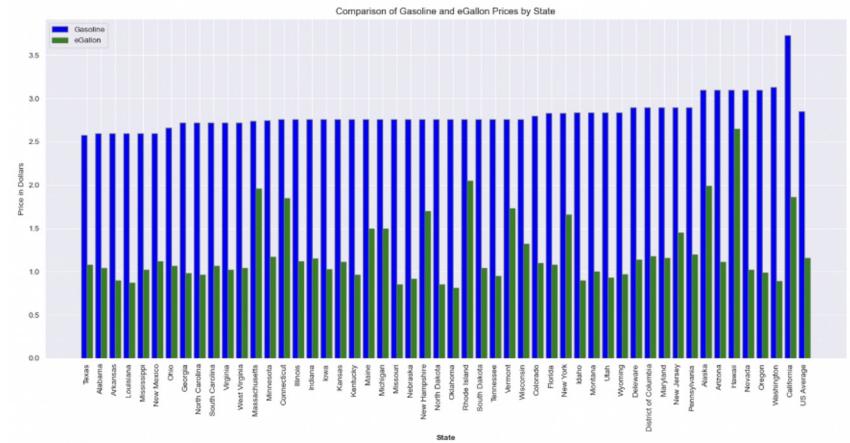
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The national average cost of “fuel” for an electric vehicle” is about 60% less than for a gasoline vehicle

Average price of a gallon of Gasoline and an eGallon



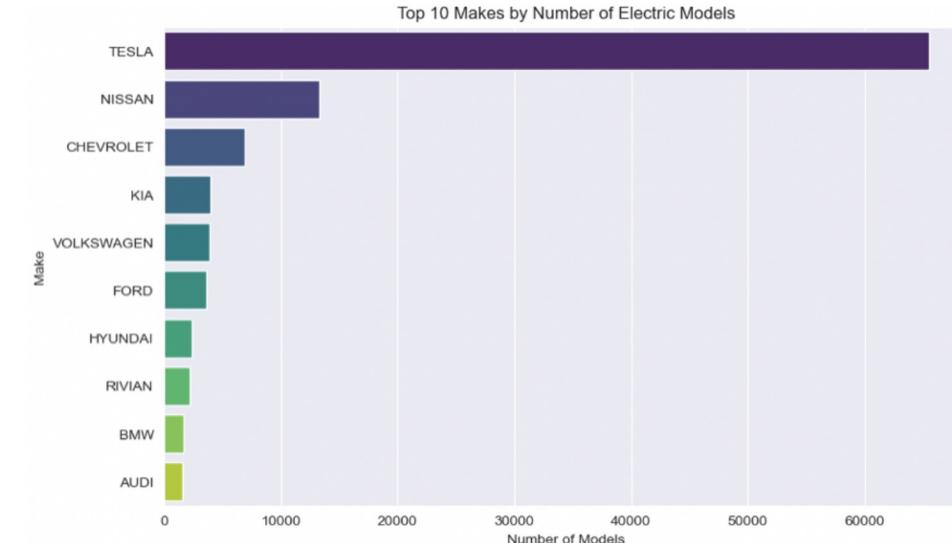
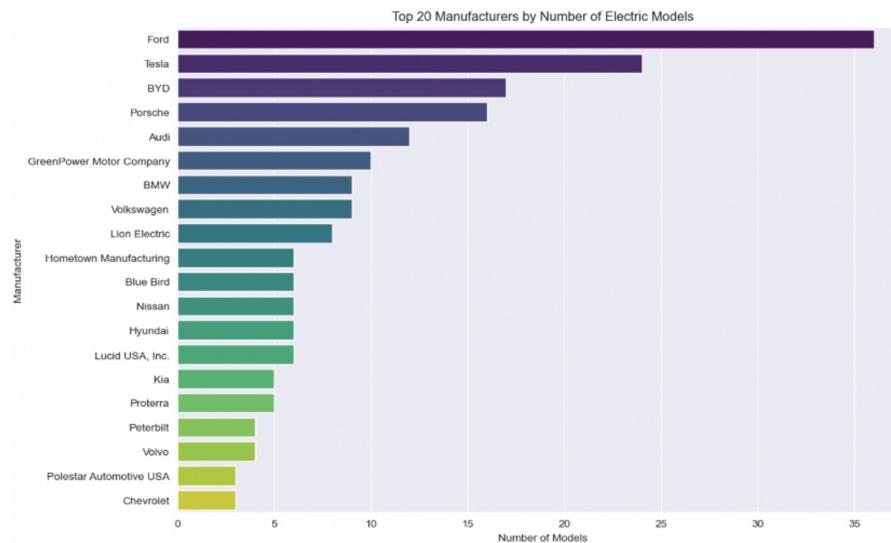
Driving the Future: ELECTRIFY, where Innovation Meets the Road

ELECTRIFY

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Market Landscape

Tesla and Ford's dual leadership in manufacturing and sales underscores the effectiveness of their strategies.



Top 20 Battery Electric Vehicle Manufacturers in the US

Top 10 Battery Electric Vehicle Sellers in Washington State

Customer Preference

**Specific feature for each body type
and aggregated values guide our EV market strategy.**

	Make	Model	Body Style	Sales Count	Acceleration (sec)	TopSpeed (km/h)	Range (km)	Efficiency (Wh/km)	FastChargeSpeed (km/h)	Drive	NumberofSeats	PriceinGermany	PriceinUK	PriceUS (\$)
0	VOLKSWAGEN	ID.4	SUV	2839	8.5	160	410	188	500	Rear Wheel Drive	5	0	40800.0	49,776.00
1	TESLA	MODEL Y	SUV	26194	5.1	217	450	169	750	All Wheel Drive	7	€59,965	54000.0	65,880.00
2	TESLA	MODEL X	SUV	5002	3.9	250	475	189	710	All Wheel Drive	7	€95,990	90980.0	110,995.60
3	TESLA	MODEL S	Sedan	7542	3.2	250	555	162	830	All Wheel Drive	5	€86,990	83980.0	102,455.60
4	TESLA	MODEL 3	Sedan	26766	5.6	225	340	150	570	Rear Wheel Drive	5	€43,560	40990.0	50,007.80
5	NISSAN	LEAF	Hatchbag	13093	7.9	144	220	164	230	Front Wheel Drive	5	€29,990	25995.0	31,713.90
6	KIA	NIRO	Hatchbag	1775	7.8	167	370	173	350	Front Wheel Drive	5	€39,090	32445.0	39,582.90
7	KIA	EV6	SUV	1561	8.5	185	320	181	740	Rear Wheel Drive	5	€44,990	40985.0	50,001.70
8	HYUNDAI	KONA ELECTRIC	SUV	557	7.9	167	395	162	370	Front Wheel Drive	5	41,850	0.0	44,779.50
9	HYUNDAI	IONIQ 5	SUV	1464	8.5	185	310	187	720	Rear Wheel Drive	5	€41,900	36995.0	45,133.90
10	FORD	MUSTANG MACH-E	SUV	2431	6.9	180	345	197	380	Rear Wheel Drive	5	€46,900	41330.0	50,422.60
11	AUDI	E-TRON	SUV	952	5.7	200	365	237	590	All Wheel Drive	5	0	71500.0	87,230.00

	Body Style	Total_Sales_Count	Average_Acceleration	Average_Top_Speed	Average_Electric_Range	Average_Efficiency	Average_Charging_Speed	Average_Number_of_Seats	Average_Price_USD
0	SUV	41000	6.88	193.0	383.75	188.75	595.0	5.5	63027.41
1	Sedan	34308	4.40	237.5	447.50	156.00	700.0	5.0	76231.70
2	Hatchbag	14868	7.85	155.5	295.00	168.50	290.0	5.0	35648.40

Integrated ‘Feature’ dataset with Top 10 Sellers EV models (>500 units sold)
to identify BEV benchmarks and customer preferences

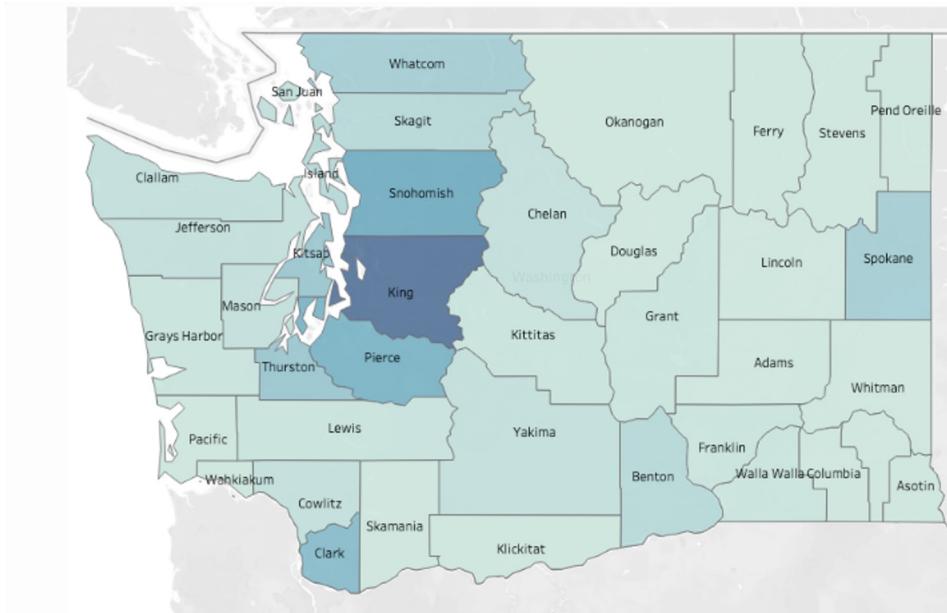
Customer Preference

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	SUV	Sedan	Hatchback
Avg Acceleration	6.88	4.44	7.85
Avg Top Speed	193	237.5	155.5
Avg Electric Range	383.75	447.5	295
Avg Efficiency	188.75	156	168.5
Avg Charging Speed	595	700	290
Avg Number of Seats	5.5	5.0	5.0
Avg Price	63,027.41 USD	76,231.70 USD	35,648.40 USD

Charging Station

Correlation: more stations lead to greater consumer interest and sales.



Population of EVs per County in Washington



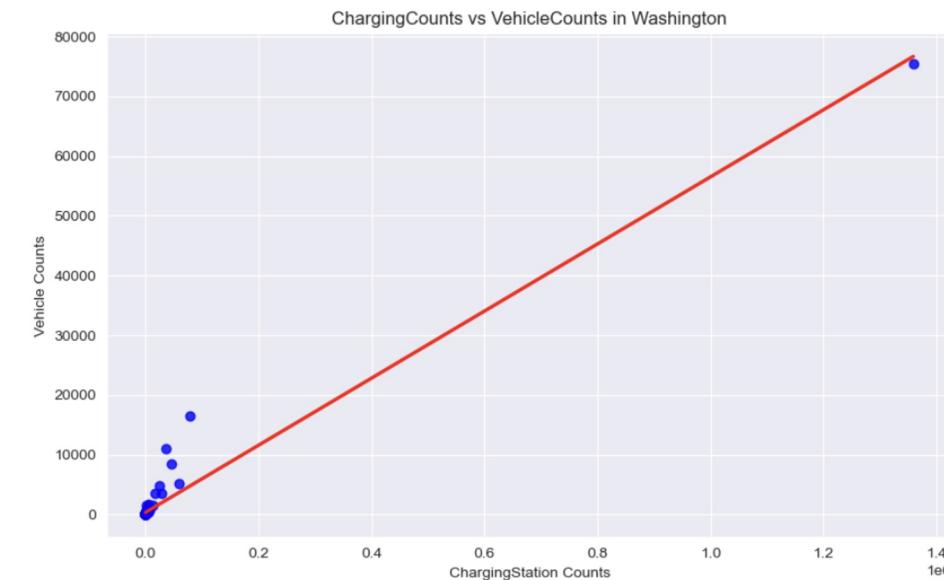
Population of EV Public Charging Stations per County in Washington

Charging Station

There is a direct correlation between the prevalence of charging stations and the number of EV owners.

Dep. Variable:	VehicleCounts	R-squared:	0.954			
Model:	OLS	Adj. R-squared:	0.954			
Method:	Least Squares	F-statistic:	2917.			
Date:	Fri, 17 Nov 2023	Prob (F-statistic):	1.25e-95			
Time:	13:22:21	Log-Likelihood:	-1230.3			
	coef	std err	t	P> t	[0.025	0.975]
const	329.1395	119.096	2.764	0.006	93.680	564.599
ChargingCounts	0.0562	0.001	54.009	0.000	0.054	0.058

P-values indicate a statistically significant correlation between Charging Counts and Vehicle Ownership.



Charging Station

Regions with more Level 2 & DC Fast chargers show increased BEVs, significantly influencing sales in Washington.

This trend is likely applicable across the U.S., based on extensive Washington data.

OLS Regression Results						
Dep. Variable:	count	R-squared:	0.980			
Model:	OLS	Adj. R-squared:	0.980			
Method:	Least Squares	F-statistic:	2275.			
Date:	Tue, 14 Nov 2023	Prob (F-statistic):	2.92e-117			
Time:	19:56:06	Log-Likelihood:	-1170.8			
No. Observations:	142	AIC:	2350.			
Df Residuals:	138	BIC:	2361.			
Df Model:	3					
Covariance Type:	nonrobust					

	coef	std err	t	P> t	[0.025	0.975]
const	123.0333	80.902	1.521	0.131	-36.935	283.002
Level1_Count	-3.8623	1.967	-1.963	0.052	-7.752	0.027
Level2_Count	0.0272	0.009	3.166	0.002	0.010	0.044
DC_Fast_Count	0.6807	0.061	11.130	0.000	0.560	0.802

Omnibus:	143.734	Durbin-Watson:	2.066
Prob(Omnibus):	0.000	Jarque-Bera (JB):	7033.780
Skew:	3.156	Prob(JB):	0.00
Kurtosis:	36.896	Cond. No.	1.13e+05

Cluster Analysis

These clusters illuminate the inherent groupings observed in most BEV cars within the broader US automotive market.

Clustering Output Based On US Vehicle Features Dataset

Characteristics	Cluster 1	Cluster 2	Cluster 3
Characteristics #1	Moderate acceleration, possibly slightly lower than average.	Significantly lower acceleration but notably higher top speed and range.	Moderate acceleration, possibly slightly higher than average.
Characteristics #2	Average top speed and range.	Lower efficiency but significantly higher fast charge speed.	Moderately lower top speed and range compared to the dataset's average.
Characteristics #3	Slightly higher efficiency and fast charge speed compared to the dataset's average.	Dominated by vehicles across all drive types (All-Wheel Drive, Front-Wheel Drive, and Rear-Wheel Drive).	Lower efficiency and moderately lower fast charge speed.
Characteristics #4	Predominantly consists of vehicles with All-Wheel Drive, though Front-Wheel Drive and Rear-Wheel Drive are also present, but less prominently.		Relatively reduced representation of all drive types compared to the dataset's average.

Cluster 1

Cluster 2

Cluster 3

Balanced Performance & Fast-charging

Diverse High Speed & Range

Modest Performance with Varied Drive Types

Cluster Analysis

This delineation elucidates the inherent clusters existing within the Washington automotive market.

Clustering Output Based On Washington EV Population Dataset			
Characteristics	Cluster 1	Cluster 2	Cluster 3
Characteristics #1	Predominantly consists of hatchback vehicles.	Fewer occurrences of hatchback and sedan vehicles.	Fewer occurrences of hatchback and SUV vehicles.
Characteristics #2	Fewer occurrences of sedan and SUV vehicles.	Stronger representation of SUV vehicles.	Stronger representation of sedan vehicles.
Characteristics #3	Average sales count.	Average sales count.	Higher than average sales count.
Characteristics #4	Higher than average acceleration but lower than average top speed.	Higher than average acceleration but lower than average top speed.	Lower acceleration but higher than average top speed.

Cluster 1

Cluster 2

Cluster 3

Hatchbacks

Higher acceleration and lower top speed

SUVs

Higher acceleration but lower top speeds

Sedans

Lower acceleration but higher top speeds

Driving the Future: ELECTRIFY, where Innovation Meets the Road

SOLUTION

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01

Utilizing Benchmarks as A Proxy for Entry

Tesla, excelling in both production and sales, sets a benchmark for EVs with its extensive **Supercharger network** and **customer-focused innovations** like online customization and software updates, providing key strategies for competitive market entry.



02

Strategies Based on Different Vehicle Body Types and Their Features

SUVs as sales leaders due to their efficiency and family appeal, **Sedans** attract a performance-oriented, wealthier customer base, while **Hatchbacks** present growth opportunities in the budget-conscious segment, collectively providing our client with comprehensive market insights for future product development.

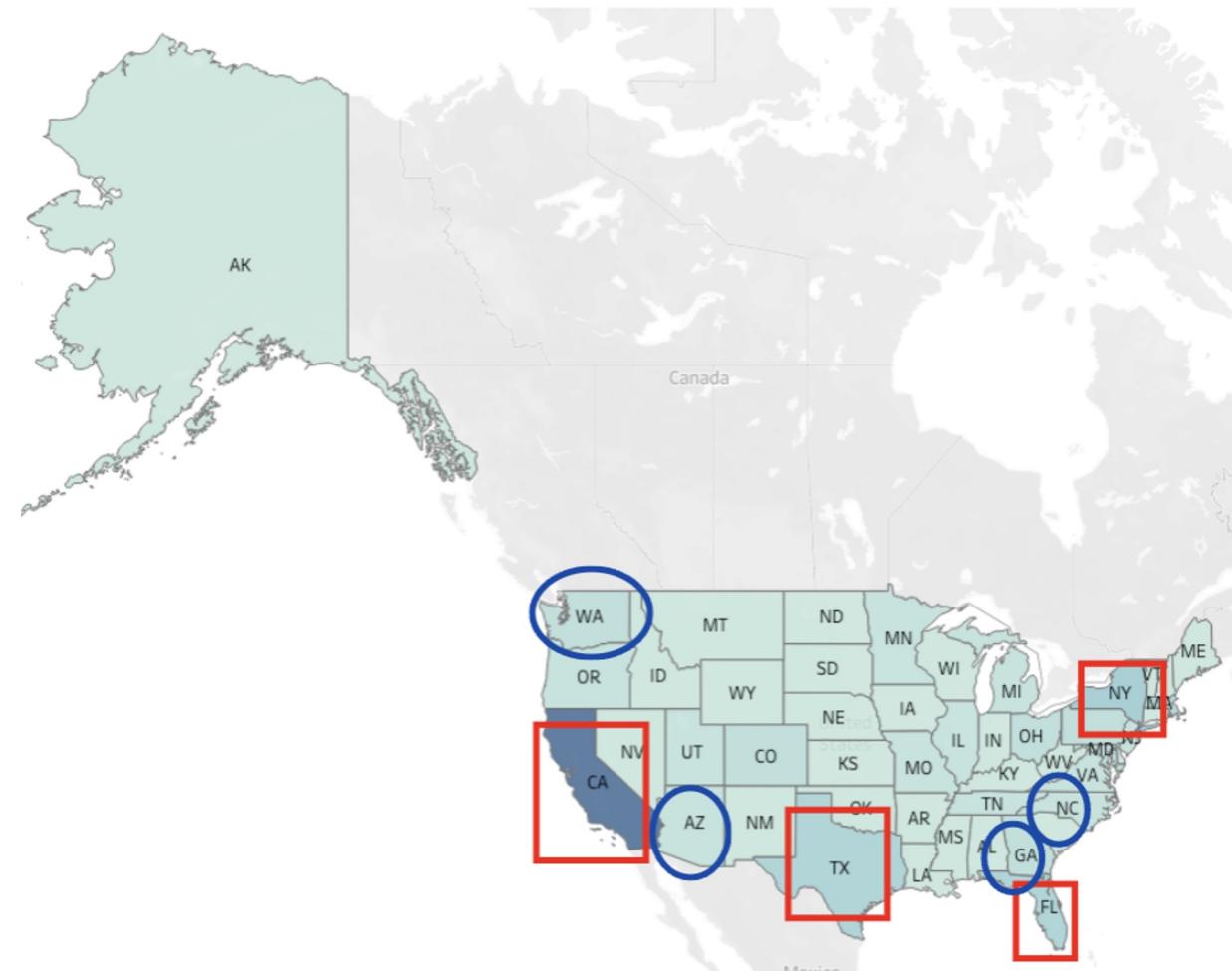


03

Strategic Targets for Vehicle Sales and Charging Infrastructure Investment

The analysis shows a strong link between charging station availability and EV ownership, suggesting states with developed infrastructure like **California, Texas, Florida, and New York** as ideal markets for EV sales.

For long-term strategy, we propose pioneering infrastructure development in regions with **high growth potential but lacking facilities**, laying the groundwork for our expansive EV network.



04

Strategic Alliance Formation with Suppliers and Traditional Manufacturers

We advise Electrify to **form alliances with established vehicle manufacturers**, leveraging their expertise and resources to boost manufacturing capabilities and scalability. This collaboration can reduce entry costs, easing access to the BEV market. Additionally, we recommend **strategic partnerships with key suppliers, particularly in areas like lithium-ion batteries and charging stations**, offering competitive advantages and profit potential for all parties involved.



05

Maximizing Company Visibility through Participation in Industry-Specific Conventions

By attending events and conventions popular among battery electric vehicle manufacturers, our customer can effectively **promote their brand, connect with key industry players, and keep up-to-date with the latest trends and technologies** in the BEV market.



Our Recommendations

- 01 Learning from the Industry Giants**
- 02 Unveiling Market Dynamics Across SUVs, Sedans and Hatchbacks for Strategic Product Development**
- 03 Leveraging Charging Infrastructure for Optimal BEV Market Expansion**
- 04 Fostering Strategic Alliances and Partnership for BEV Market Success**
- 05 Elevating Brand Impact Through Strategic Participation in BEV Industry Events**





Thank you!