

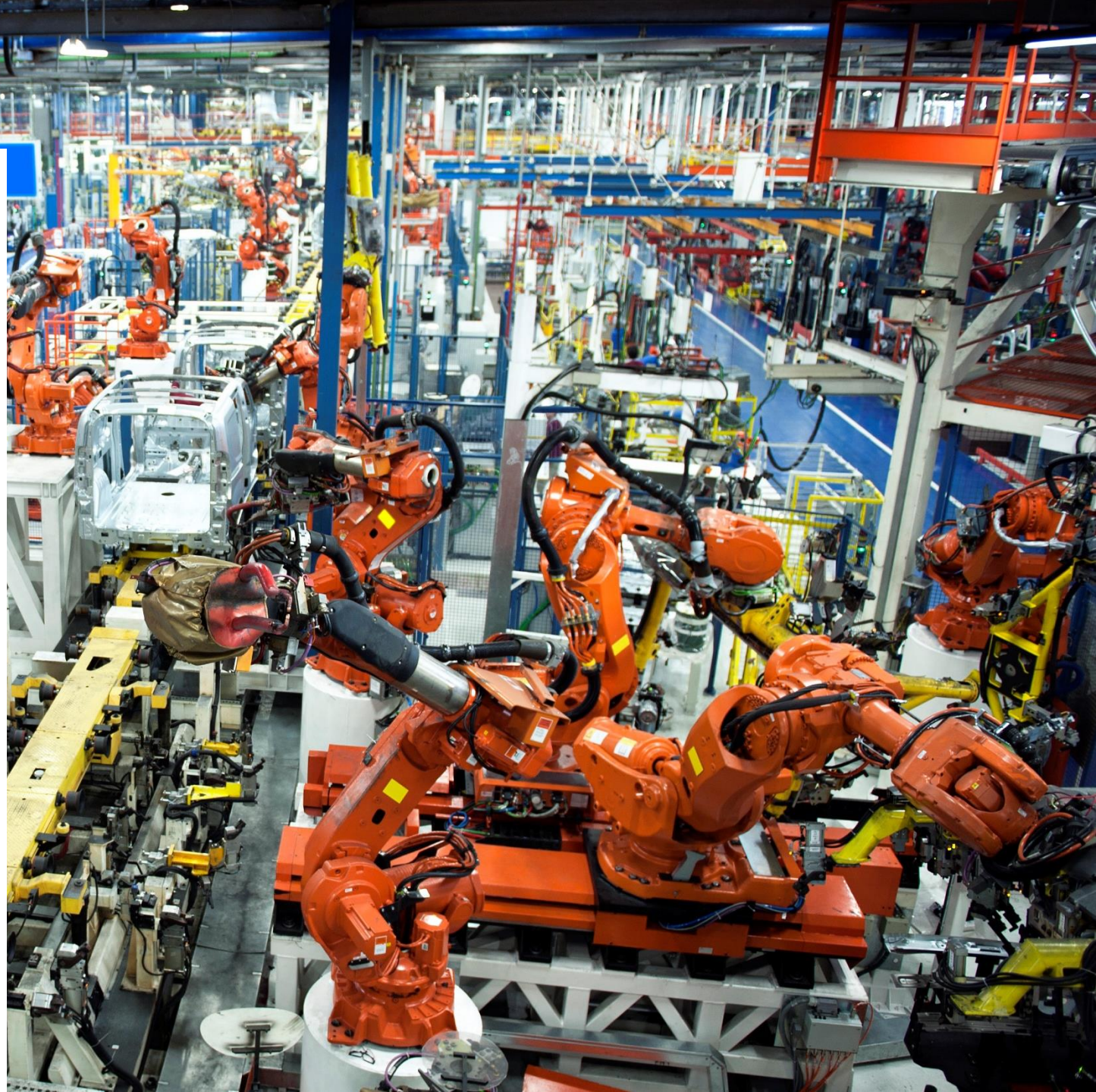


**JLL** SEE A BRIGHTER WAY

# U.S. Automotive manufacturing trends

**Americas Research**

2023





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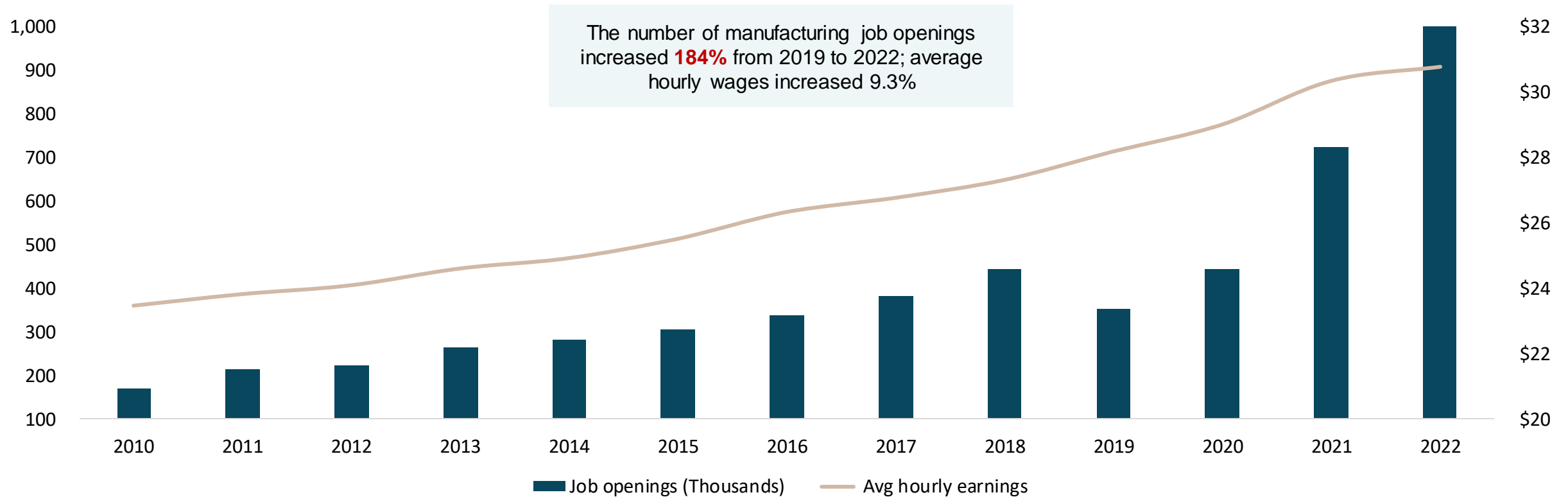
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# Major manufacturing trends

# Manufacturing is picking up speed throughout the country

In contrast to the off-shoring trends of manufacturing during the last half of the 20<sup>th</sup> century, more companies are now choosing to build their facilities within the borders of the United States. With advanced manufacturing trends gaining steam, manufacturers are electing to capitalize upon the rich labor pool in the country, with specific emphasis and focus put into recruiting and retaining engineers.





# Electric vehicle assembly and semiconductors lead the way

The momentum for green technology and electric vehicles has spurred a massive growth in the production of electric vehicles and their associated batteries. Throughout the Sunbelt, automotive and battery manufacturers are spreading their wings and taking as much space as possible; Arizona, Texas, and Georgia have been the greatest recipients of these new projects.

## Electric vehicle assembly plants

NIKOLA

RIVIAN



VINFAST



NAVISTAR



TESLA

LUCID

## Electric vehicle battery manufacturing plants

STELLANTIS

SAMSUNG SDI

LG Energy Solution

SK innovation

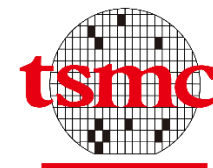


TOYOTA



Automotive Energy Supply Corporation

## Semiconductor plants

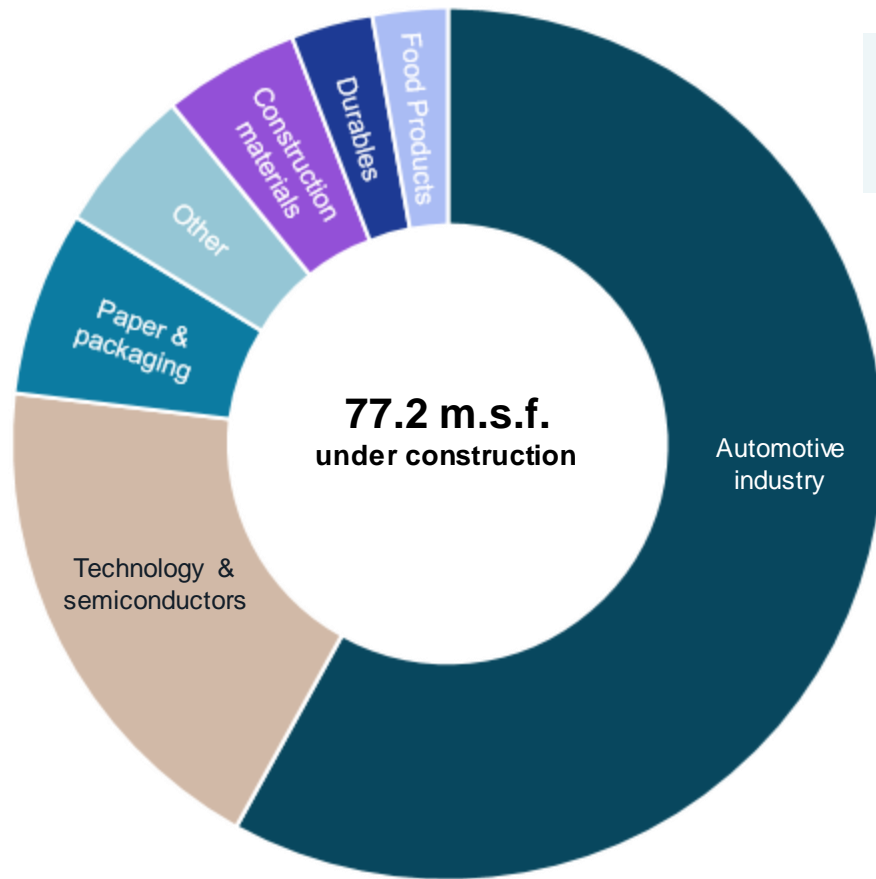


SAMSUNG

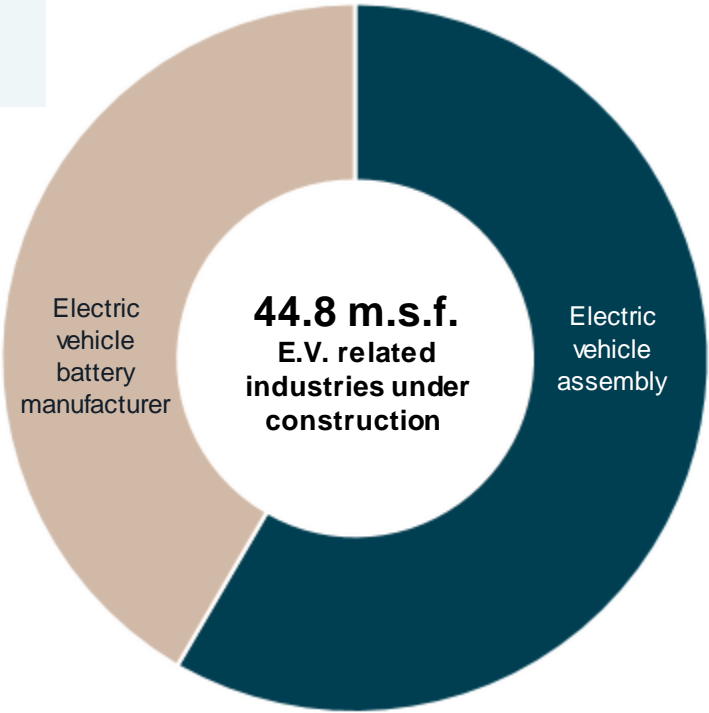


TEXAS INSTRUMENTS

# Electric Vehicles and battery production have dominated the manufacturing industry in the U.S.



Automotive industry accounts for **58%** of all new manufacturing facilities in the country





# Deep dive on electric vehicle trends



# Challenges of electric vehicle manufacturing

Whether it is a major automotive brand or a startup company, manufacturers of electric vehicles face four major hurdles:



Source: JLL Research, SME, "Moving EV Manufacturing into the Fast Lane", October 2020

01

**Light weighting:** To maximize drive range and battery life, manufacturers must continue to find ways to decrease the weight of the vehicles. A 10% weight reduction can improve fuel economy up to 8%. Manufacturers are utilizing lightweight materials in the vehicle body, such as magnesium, aluminum alloys, and carbon fiber.

02

**Transition to EV platform:** Many EVs on the market are adapted from pre-existing internal combustable engine (ICE) vehicles. Due to the differences in body and frame between electric and ICE powertrains, the non-original EVs face issues with battery size and powertrain placement.

03

**Battery production:** The largest contributor to the overall costs of EVs is the battery pack, and the production of battery cells accounts for 70% of the total cost of the battery pack. While improvements in cell chemistry will help, battery manufacturers will need to continue developing ways to reduce costs in the production of battery packs and will need to be efficient with their use of lithium due to the huge increase in demand.

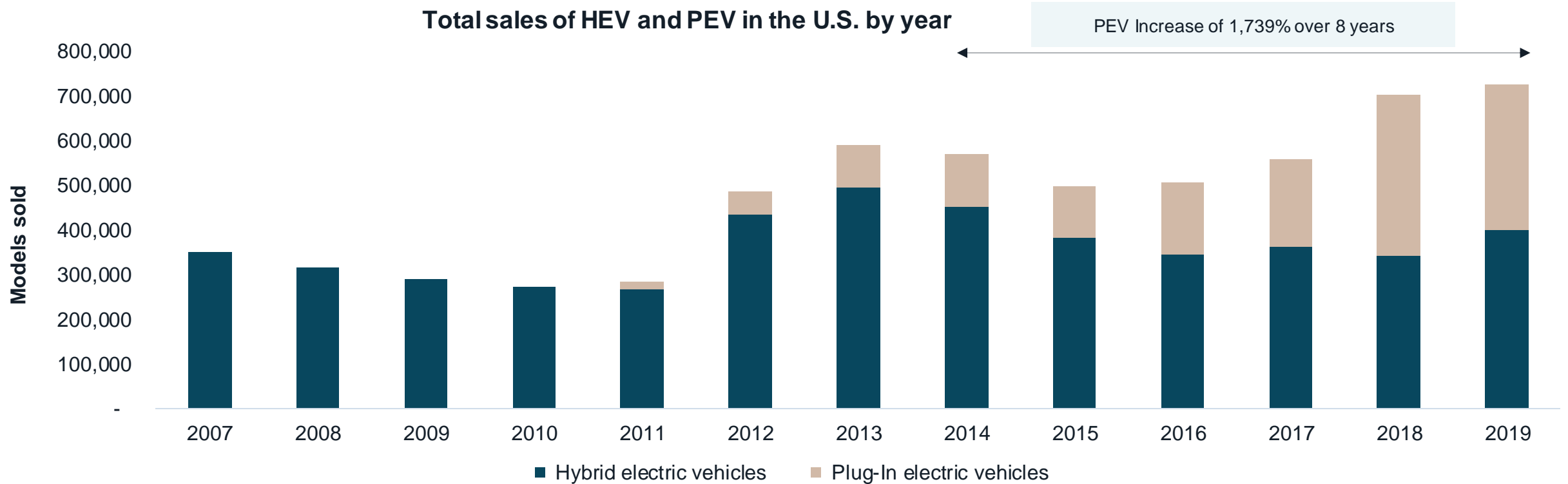
04

**Supplier evolution:** The relationship between automotive manufacturers and their suppliers will become more vital and complex. The necessity to maintain their supply chains (especially with hard-to-find materials, such as chips) will force manufacturers and suppliers to increase traceability and quality assurance with their products.



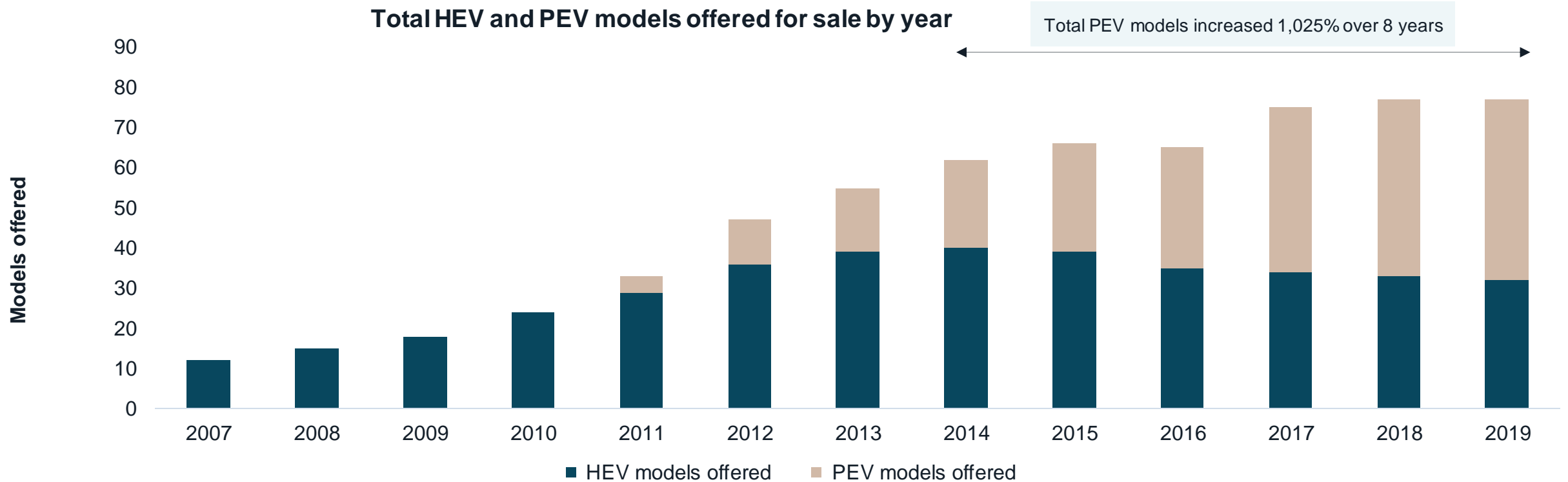
# U.S. PEV and HEV historic sales

When the first Hybrid Electric Vehicle (HEV) was introduced to the U.S. market in 1999, only 17 models were sold. Since then, the yearly total of both Hybrid electric vehicles and Plug-In Electric Vehicles (PEV) sold has increased to more than 725,000 in 2019.



# Plug-in electric models take majority of market share

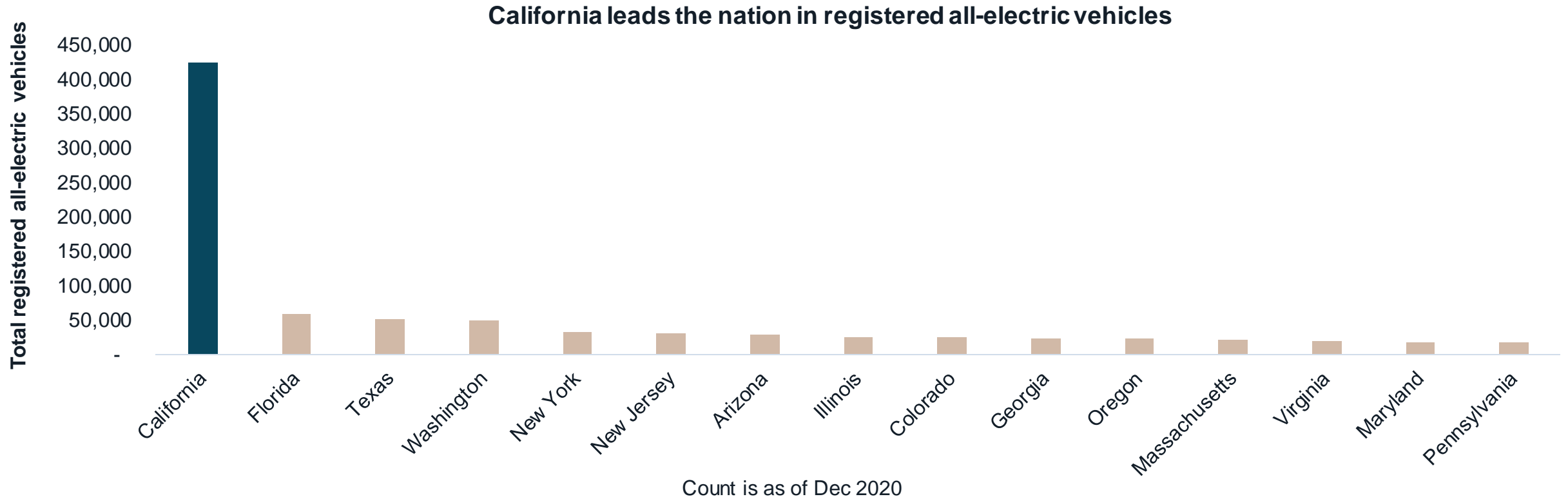
As PEV technology continues to improve, manufacturers have introduced numerous models to the market that include full all-electric vehicles, along with plug-in hybrid vehicles, which include both an electric motor with plug in technology and a gasoline engine.





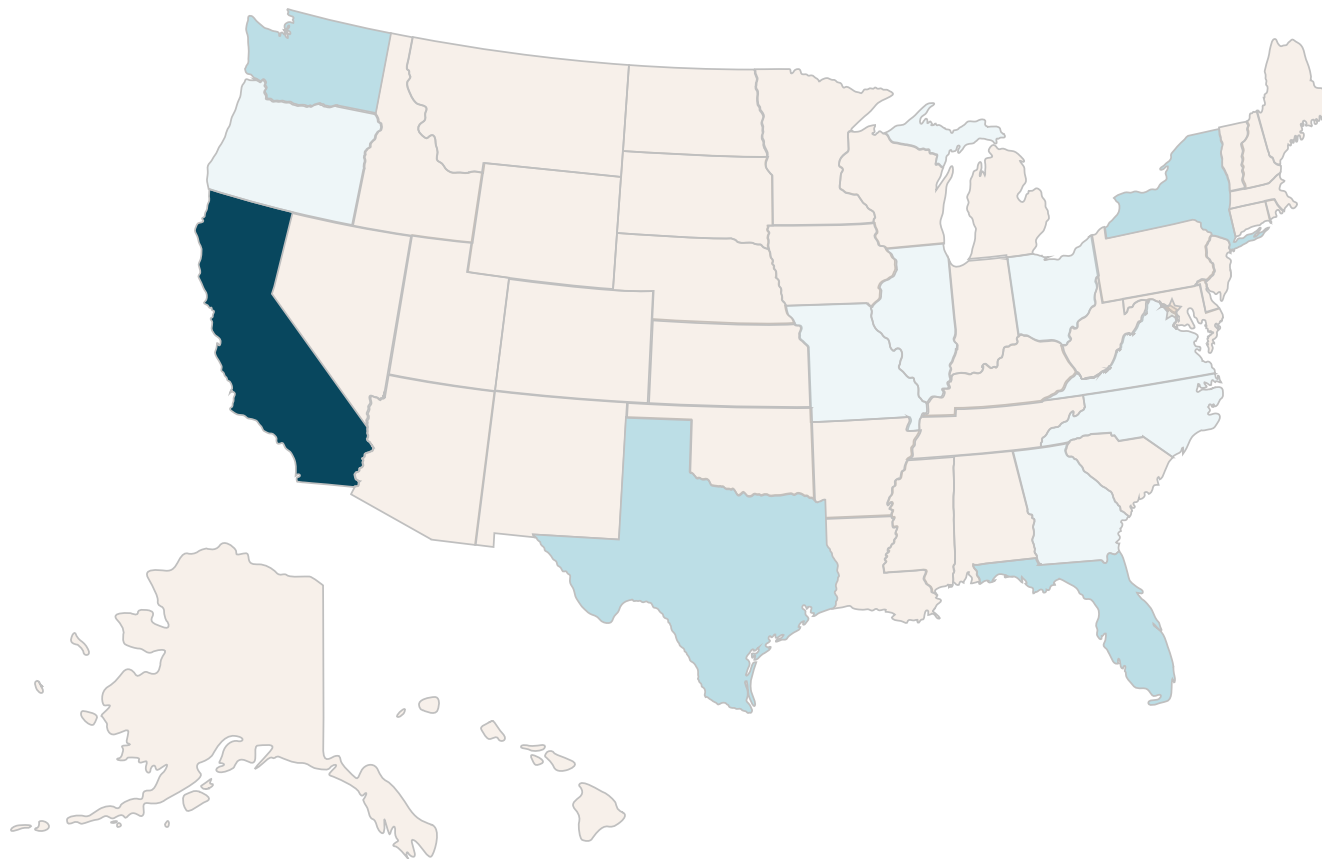
# Top 15 states with all-electric vehicle registrations

California has the highest level of registered all-electric vehicles throughout the country, followed by Florida and Texas. With more than 400,000 vehicles in the state, California requires the highest number of EVSE ports.



# Electric Vehicle Supply Equipment (EVSE) ports by state

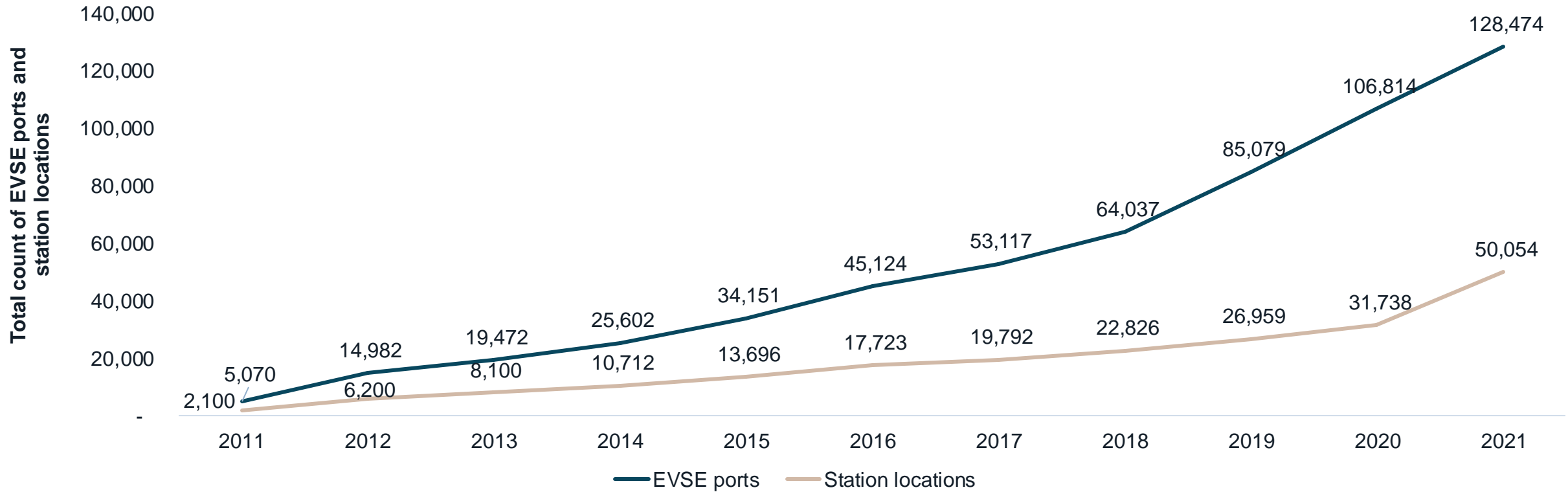
Throughout the country, there are more than 125,000 public and private EVSE ports, located across more than 50,000 stations. California has the highest concentration, with more than 42,000 EVSE ports across the state. Alaska has the lowest concentration, with 100 EVSE ports in the state.





# Public and private charging infrastructure growth

As PEVs gained dominance in the country's transportation modes over the past decade, the necessity for more charging ports and stations has caused a spike in building new ports. The number of charging stations increased more than **55%** in 2021 alone.



A photograph of a red car on an assembly line. The car is positioned on a yellow overhead crane system. The background shows a complex industrial facility with various pipes, beams, and machinery. The lighting is bright, highlighting the car's glossy finish.

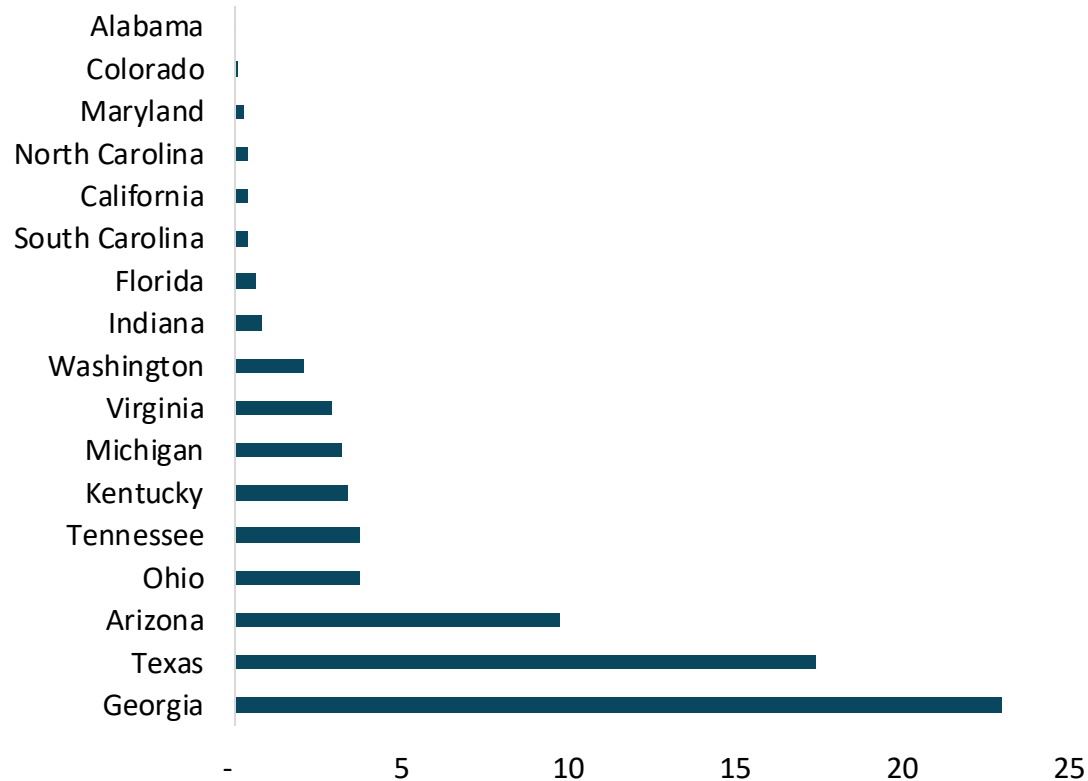
# Site selection and facility design trends



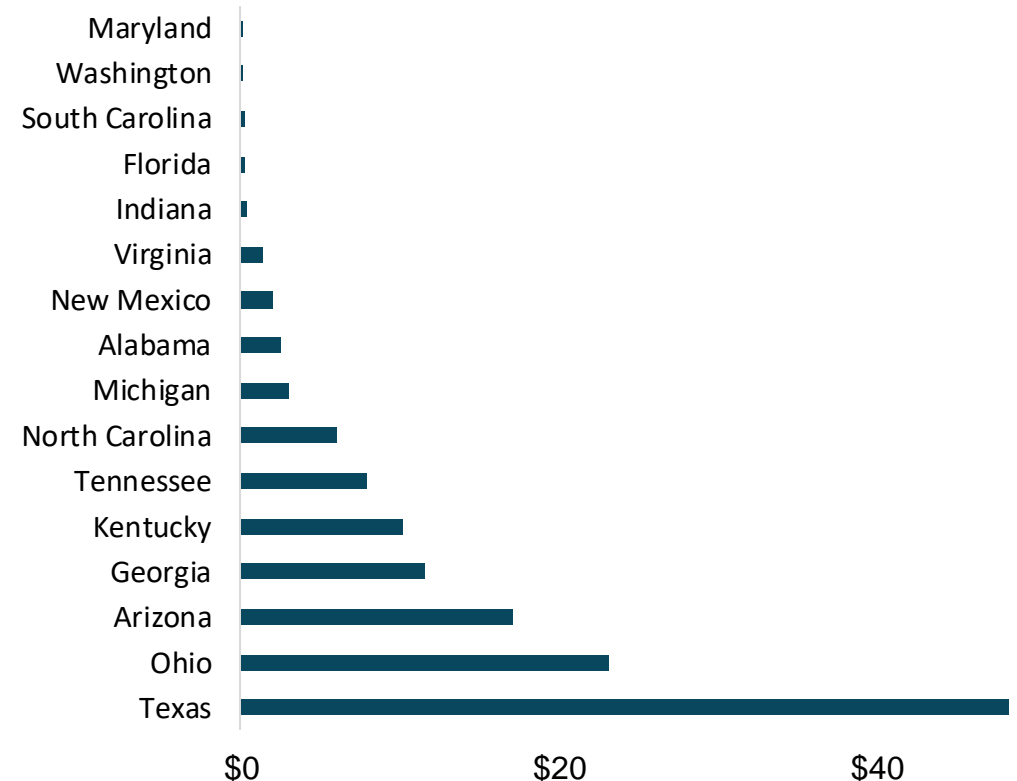
# Recent manufacturing announcements in the U.S.

States in the Southeast and Southwest states have benefitted the most from manufacturers onshoring their operations, with Texas, Georgia, and Arizona being the greatest recipients so far.

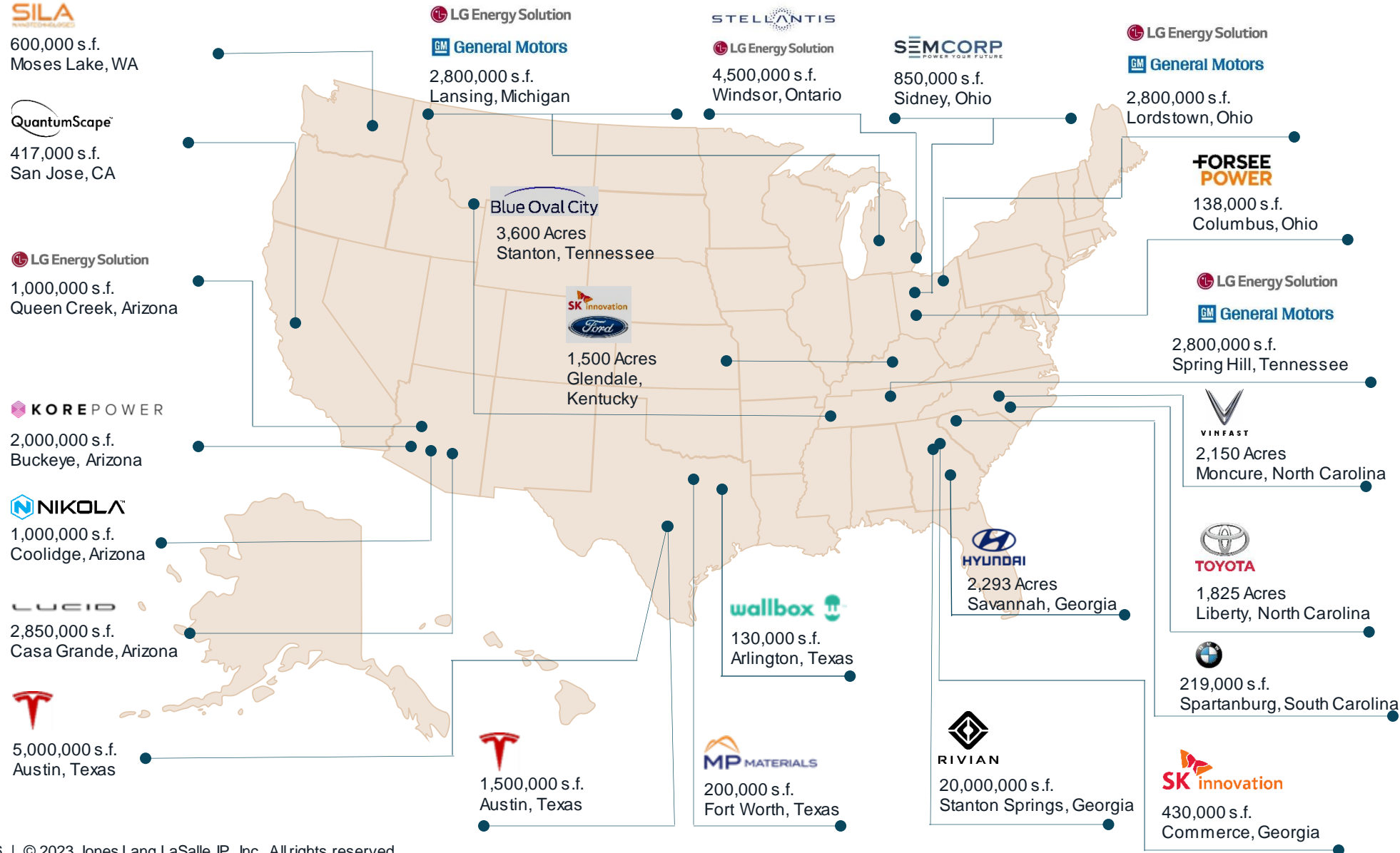
**Total s.f. announced by state (in millions)**



**Total capital investment by state (in billions)**



# Where do the EV manufacturers want to go?



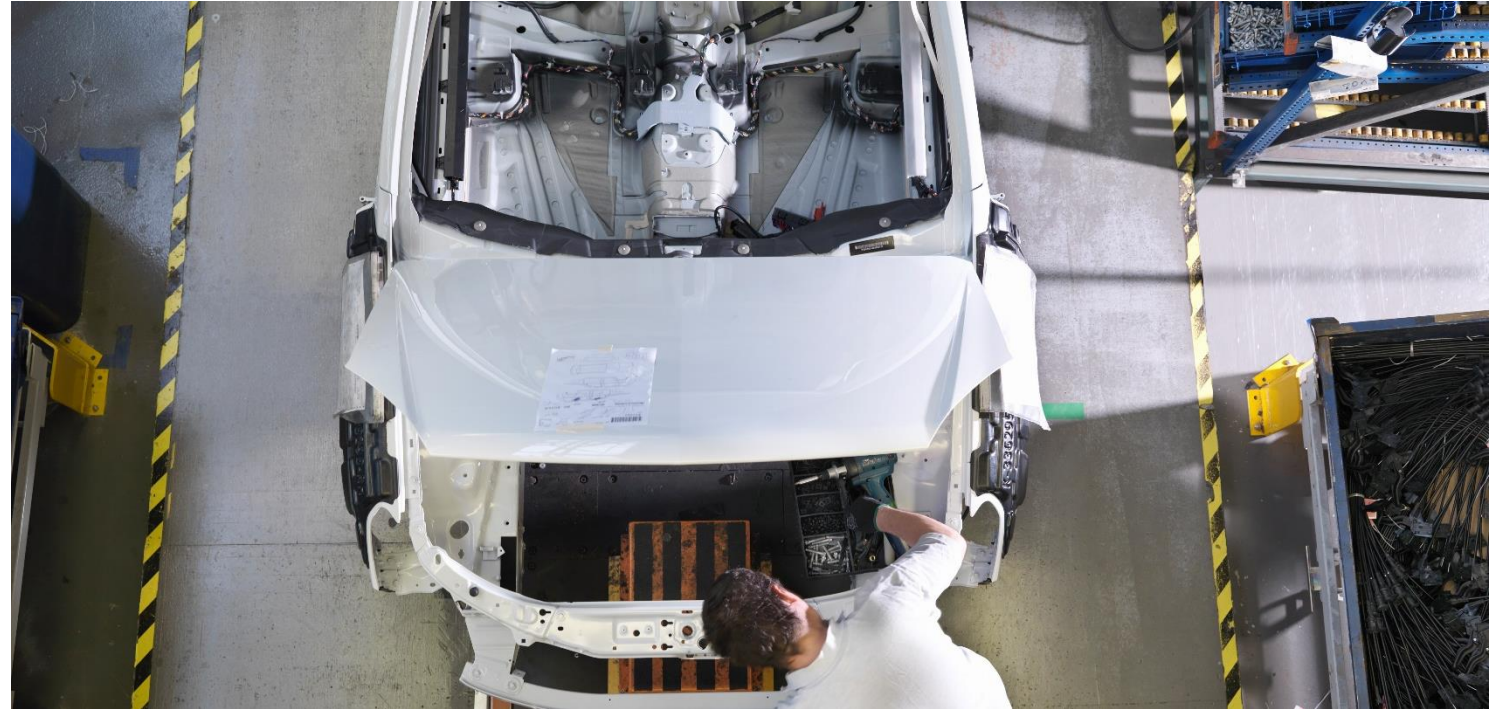
## States with significant EV projects

-  **Georgia**  
3 projects  
20.4 million s.f.
-  **Arizona**  
4 projects  
6.9 million s.f.
-  **Ohio**  
3 projects  
3.8 million s.f.
-  **Tennessee**  
2 projects  
2.8 million s.f.
-  **Michigan**  
2 projects  
2.8 million s.f.
-  **Texas**  
4 projects  
2.3 million s.f.



# Automated guided vehicles are replacing traditional conveyor belts

For generations, the conveyor belt system of assembly pioneered by Henry Ford has been the gold standard for automotive production. With the rise of technological advancements, Automated Guided Vehicles (AGV) have provided manufacturers with an alternative to cutting pits in the floor and installing conveyor belt systems. AGV can carry heavy loads, like car frames, are interchangeable, and provide flexibility in the floorplan of automotive facilities. While conveyor belt systems will still be required in certain aspects of the assembly process, future assembly plants will require more automation to allow for greater adaptability to changing circumstances.



**Heavy loads**




**Maneuverability**



**Interchangeability**



**Flexibility**



# Significant electric vehicle and battery assembly announcements



# Lucid

LUCID



Models	Style	Range (miles)	Starting price
Air Pure	Sedan	406 (480 HP)	\$87,400
Air Touring	Sedan	406 (620 HP)	\$107,400
Air Grand Touring	Sedan	516 (1,050 HP)	\$154,000
Air Dream Performance	Sedan	471 (1,111 HP)	\$169,000
Air Dream Range	Sedan	520 (933 HP)	\$169,000

Lucid entered a new playing field when in late 2021, Motor Trends named the Air model the 2022 Car of the Year Winner. With its impressive horsepower output and battery range, Lucid is poised to present a direct challenge to Tesla's dominance in the electric vehicle field.

Lucid Motors broke ground on their flagship facility, called Lucid Powertrain Manufacturing Plant (LPM-1) in December 2019 in Casa Grande, Arizona. The facility has since become operational, and Lucid is betting big on a new expansion.

Phase two of Lucid's expansion calls for a new facility near LPM-1, to be called Lucid Advanced Manufacturing Plants (AMP-1), that will span 2.85 million S.F., and will allow the company to increase production to 90,000 vehicles per year by 2023.

Lucid's capital investment in Casa Grande has surpassed an estimated \$700 million and is expected to bring in more than 2,400 direct jobs to the region.



# Rivian



Models	Style	Range (miles)	Starting price
R1T	Truck	260 – 400+	\$67,500
R1S	SUV	260 – 320+	\$72,500

Rivian currently offers two model styles, both of which are marketed to off-road adventurers and families. Each model offers various upgrades and trim levels, with the ability to go from 0-60 MPH in 3 seconds, depending on configuration.

In December 2021, Rivian announced plans to build their 2nd manufacturing facility, to be located 30 minutes east of Atlanta, Georgia.

This new facility will sit on over 2,000 acres, and once complete, will span approximately 20 million s.f., making it one of the largest in the industry. Along with assembly space, it will include an R&D facility, test track, and an “adventure trail”.

With capital investment estimated at \$5 billion, the project promises to be a massive boon to the state of Georgia. Construction will kick off in summer 2022, and production is expected to begin in 2024; the facility will employ more than 7,500 workers.

# VinFast



Models	Style	Range (miles)	Starting price
VF 8	SUV (Mid-Size)	~280	\$40,700
VF 9	SUV (Full-Size)	~350	\$55,500

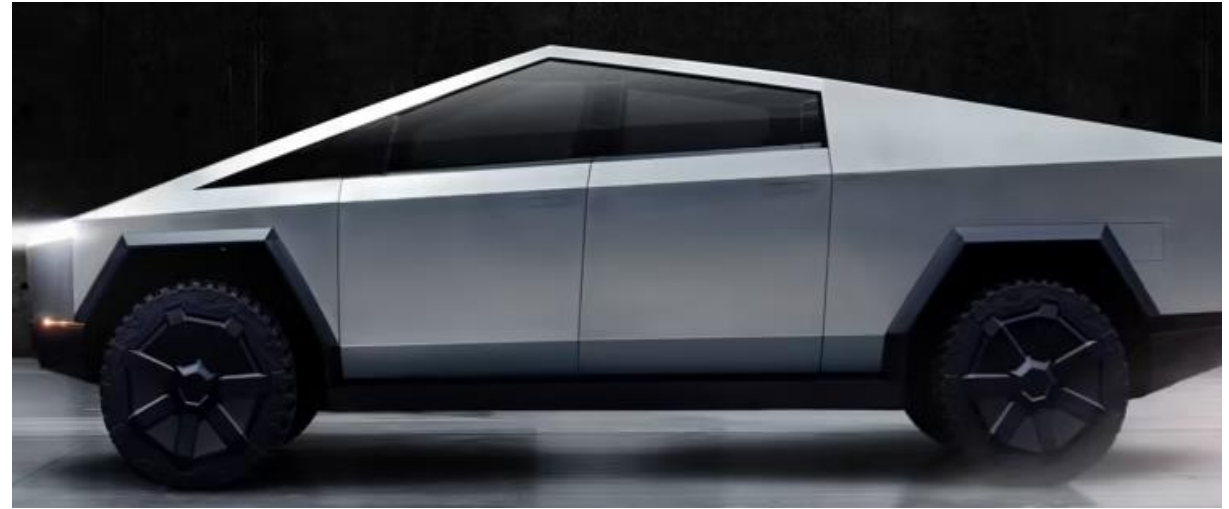
VinFast currently offers two model styles, both of which are marketed to provide comfort and luxury at an affordable cost. While each model has impressive horsepower, with 0-60 MPH in around 6 seconds, the real selling point is their Battery Subscription Program: free battery replacement if the battery drops below 70% capacity.

As the automotive section of Vietnam's largest conglomerate (Vingroup), VinFast announced in March 2022 that it had signed documentation with the state of North Carolina to build its first U.S.-based vehicle assembly facility.

Moncure, North Carolina will be the home of the new facility; the facility will span more than 2,000 acres, and by the time production starts in 2024, it will produce more than 150,000 vehicles per year.

While the project will be completed in phases, total capital investment is estimated at \$4 billion. The project is expected to produce around 7,500 jobs.

# Tesla



Models	Style	Range (miles)	Starting price
Model Y	SUV (Compact)	~315	\$62,990
Cybertruck	Truck	500+	\$39,900*

Tesla has arguably been the most successful electric vehicle manufacturer in the world. While the company currently offers four different models, the Austin-based Giga Texas factory will predominately produce the Model Y SUV and will be the home of production for the future Cybertruck.

\*Kelly Blue Book estimated value for 2023 model

When Tesla announced their intention of constructing a global Gigafactory outside of Austin in the summer of 2020, the whole state of Texas shook with excitement.

Located a stones-throw away from the Austin airport, Giga- Texas sits on more than 2,000 acres of land. According to Elon Musk, the factory is the “equivalent to three Pentagons” in size. The factory officially launched in April 2022 and is still in the process of a massive hiring blitz.

Tesla has reportedly spent over \$1.1 billion so far on the facility. However, in December 2021, Elon Musk announced via Twitter that Giga-Texas will eventually become a \$10+ billion investment and will generate at least 20,000 direct jobs (plus 100,000 indirect jobs).



# Ford - BlueOval City



Models	Style	Range (miles)	Starting price
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F-150 Lightning	Truck	320	\$39,974
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Excitement for the new F-150 Lightning has been insurmountable, with the company no longer taking orders for the cheapest trim levels; Ford sent out a memo to all dealerships that all XLT configurations are currently sold out for retail customers. With the ability to go 0-60 mph in under four seconds, the Lightning not only delivers on speed, but is also capable of towing 10,000 lbs.

Ford announced in late 2021 the company's intentions to invest \$5.6 billion in creating a massive campus, named BlueOval City, to reimagine how vehicles and batteries are manufactured. Located in west Tennessee on a nearly 6-square-mile site, the campus will build next-generation electric F-Series pickups and advanced batteries.

Along with the creation of BlueOval City, Ford and SK Innovation will partner together to build a \$5.8 billion plant in central Kentucky, to be called BlueOval SK Battery Park. This facility will consist of twin battery plants that will power Ford and Lincoln EVs.

Combined, Ford will invest \$11.4 billion and create nearly 11,000 new jobs in Tennessee and Kentucky.



# Outlook and future forecast

# Original equipment manufacturer targets timeline for EVs



TESLA

China plant production begins with capacity of .5m EVs/year



To invest £1bn to build EVs in the UK



Invest \$2.33bn in two Chinese EVs

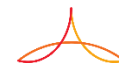


Electrify European market 25% by 2021; 1 m EVs on road by 2021



FIAT CHRYSLER AUTOMOBILES

30 new battery-powered/hybrid vehicles by 2022. 60% of cars in Europe to be hybrid or full EV



RENAULT NISSAN MITSUBISHI

12 electrified and 8 pure EVs in range; 42% of European sales to be EVs by 2022



25 EVs in range by 2023

2020

2021

2022

2023



Joint Venture: to develop pure EVs



TOYOTA

Targets 30k EV sales



Sign business agreement for commercial EVs development



MAZDA

releases first EV



HONDA

All European mainstream models to be electrified by 2022 (revised from 2025)



40 EVs in 'global portfolio'; to invest \$11.5bn on EV models by 2022



'On track' to meet 20 EV models target by 2023



1m EV sales



# Original equipment manufacturer targets timeline for EVs



25% global sales to be electric.



Electrify European market – 33% by 2025



Electrify European market – 50% by 2030



2/3s of global sales are EVs



Target of 5.5m EV sales; 0.5m sales in 2025



1m global EV sales by 2025



All models either EVs or hybrids by 2030s

2025



2030



Reach 1m total EV sales by 2025; EVs to represent 50% of global sales



To invest \$87bn in vehicle electrification by 2025; EV range to expand to 44 models by 2025. Target of 670k EV sales by 2025



70 new electric models by 2028 instead of the 50 previously planned; 40% global sales to be electric by 2030.



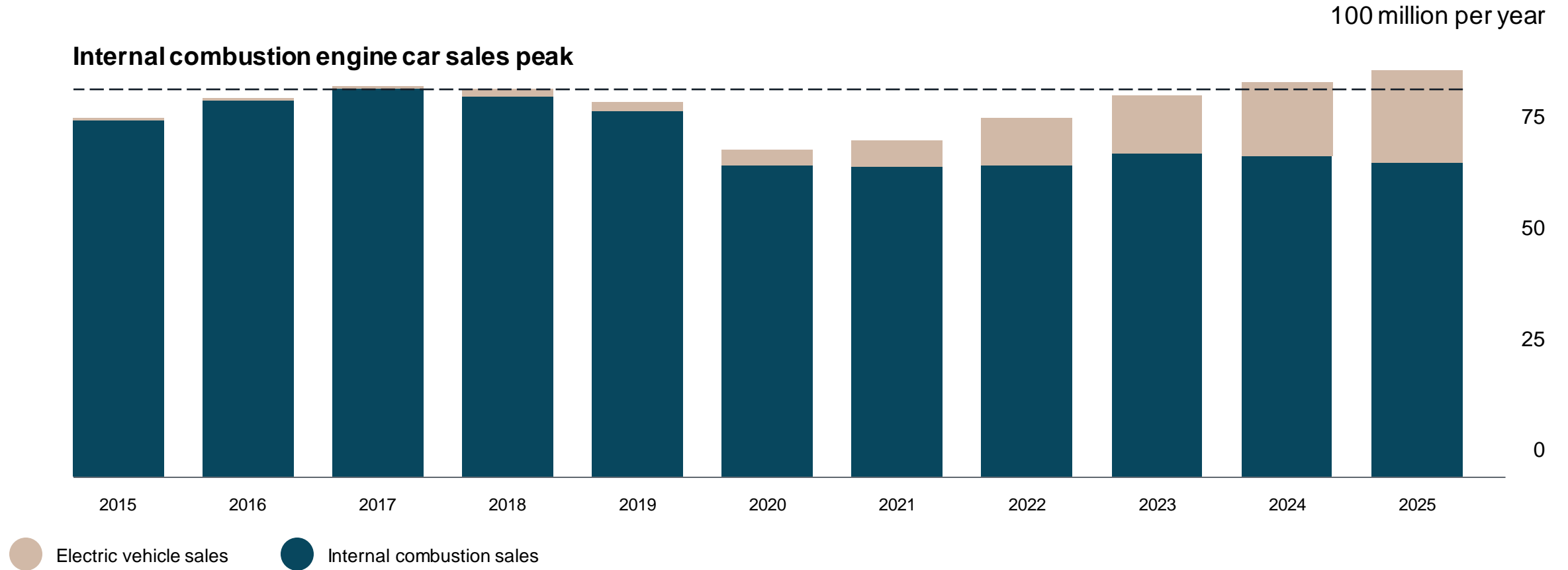
Cadillac to be majority EV



EVs to make up more than 50% of sales.

# Global Internal Combustion Engine (ICE) sales have peaked

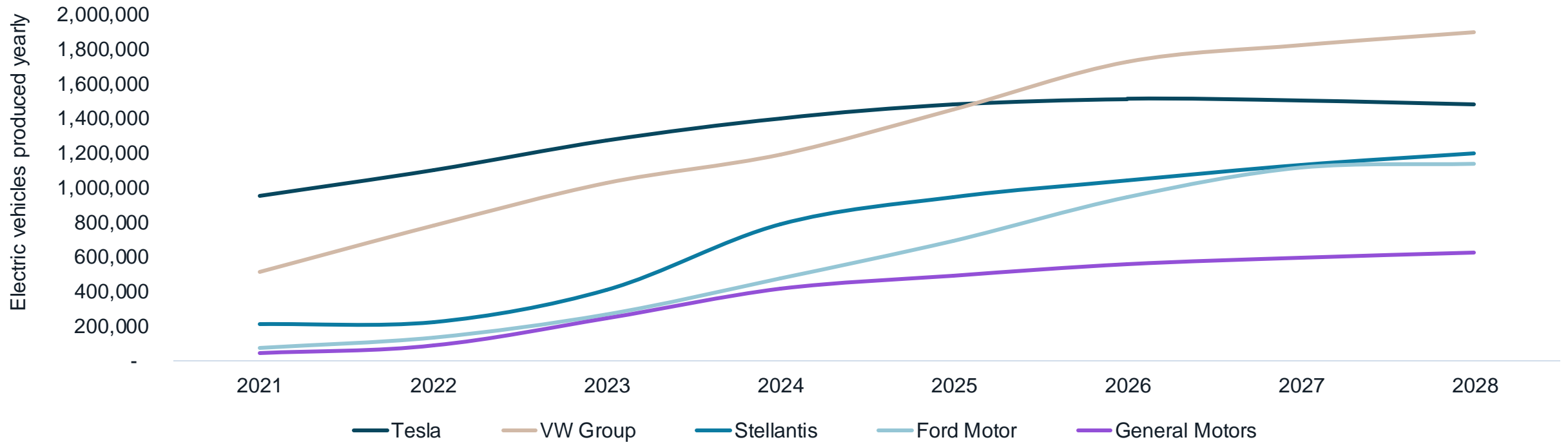
Global sales of ICE vehicles appears to have peaked in 2017, as the share of EV vehicles gains momentum worldwide.



# Detroit's "Big Three" companies are ramping up EV production

Ford, General Motors (which includes Chevrolet, Cadillac, GMC, and Buick) and Stellantis (which includes Dodge, RAM, Jeep, and Chrysler) are ramping up their transition to EVs, with 40-50% of annual volume by 2030

### Detroit is betting big on the future of E.V. manufacturing





# Which markets will benefit from the electrification of vehicles?

Certain markets and areas in the country are poised to benefit from the electrification of vehicles. These areas will all share certain characteristics:



Source: JLL Research, Bullpen, "Three Real Estate Markets That Will Benefit From The Electric Car Revolution"

- 01 Electric automobile ecosystem:** Electric vehicles require thousands of parts to produce, so metros that have developed relationships with not just manufacturers, but suppliers as well, stand to benefit the most.
- 02 Regulatory acceptance:** Areas with strong governmental incentives and funding will continue to attract manufacturers.
- 03 Manufacturing infrastructure:** In order to produce electric vehicles at scale, there needs to be a strong infrastructure in place.
- 04 Existing relationships:** Metros that already have existing relationships with manufacturers tend to fare better than regions that do not have those relationships.
- 05 High concentration of intellectual capital:** Manufacturers will focus on areas with high concentrations of intellectual capital, particularly with hardware and software.

# Thank you!

Please contact our team with any questions on the recent trends in industrial real estate.



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