

2024 Update on Future & Impact of Electric Vehicles on Gas Stations & Brownfields

FBA Annual Conference
Gainesville, FL

June 27, 2024



*This is actually happening & it will accelerate
*(with some caveats)**



Where EV industry stands - June 2024

- New EV sales in U.S. are projected to reach close to 2M in 2024
 - Would set annual EV sales record
 - 1.6M new sold in 2023; 1M sold in 2022
 - By 2030, nearly 20% of U.S. cars on road may be EVs
- Global EV sales could be approx. 17 million in 2024
 - Strongest markets – in China, Europe & U.S.
 - EV sales market share may reach 45% in China
 - 25% share in Europe & 11% share in U.S.
 - Chinese firms produced more than 50% (2023)
- Big projection: By 2035, 50% of all cars sold globally may be EVs



Where industry stands - June 2024

- EV charging network in U.S.
 - Continues to expand & be built out - but needs to quicken
 - Public & private EV charging networks
 - Federal NEVI (publicly funded) program ongoing
 - EV range anxiety abating, some concern w/ EV charging reliability
 - Compatibility; Tesla charging network planned to open to non-



EVs in 2024



- *Some cautionary notes & opportunities:*

- Increasing supply of EVs on dealer lots
- Many new EV models are coming
 - More than 30 EV models launched in 2023; more than 50 new or updated EV models released or coming in 2024
- Rush of early buyers waning? **When/will next round of potential EV buyers actually buy?**
- EVs only \$2,000-\$5,000 more expensive on average now than non-EVs
- Used EVs – Increase in U.S. used EV car sales; increase in hybrids
- November 2024 election

EVs in 2024

- “Field of Dreams” moment, according to Cox Auto Automotive (Michelle Krebs):
 - “Automakers are building more but not enough customers are coming to the field.” (7/14/23). *“If you build it, he will come.”*
- **Federal tax credit** up to \$7,500 for certain new EVs & up to \$4,000 for used EVs (Inflation Reduction Act, 2022)
- **While Tesla’s share of market is down (45% of U.S. cars sold in 2023), other automakers are up (Ford nearly doubled in U.S.)**
 - Nearly every traditional carmaker sells at least one EV – including Audi, GM/Chevrolet, Hyundai, Kia, Mazda, Nissan
- **Proposed tighter federal auto emissions goals** - Proposed in 2023 & 2024
- **2030s may be the tipping point decade in which more EVs are sold than internal-combustion vehicles**



EV projections & trends

- EV market is casting a wider net:
 - Less affluent, younger, more diverse
- **EV Intenders, Considerers, & Skeptics**
- EV “skeptics” as the next projected wave:
 - “Skeptics” likely to begin switch to “considerers” in the next 2-5 years
 - Due to technology improvements – Better range, longer battery life, improved reliability & infrastructure improvements
 - 80% of “skeptics” expected to shift to “considerers” in next 10 years
- EV “consideration” dropped between 2024 and 2022
- Top 2 current concerns: Too expensive & lack of charging stations
- Source: Cox Automotive *2024 Path to EV Adoption* (May 2024)

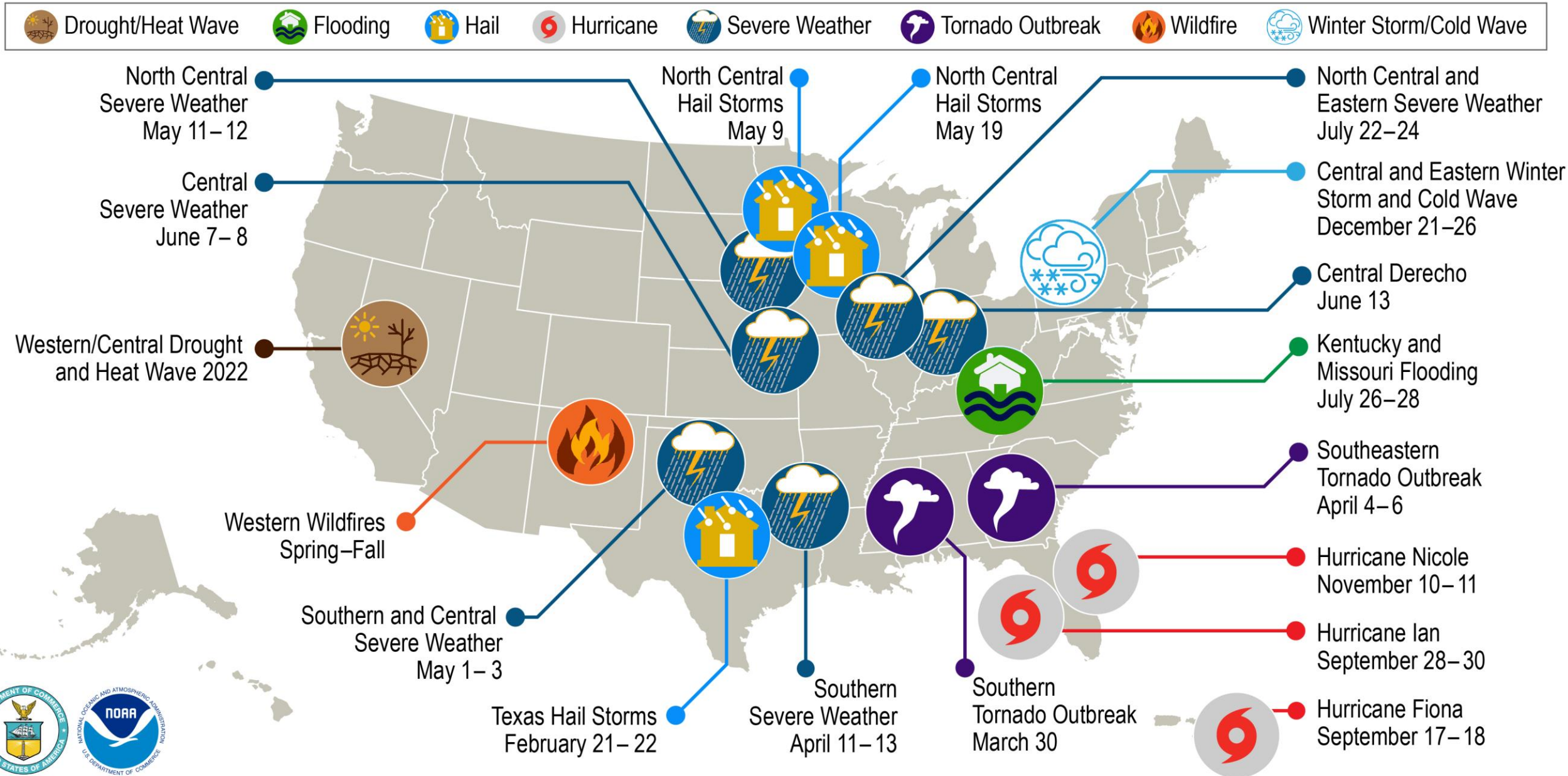


Why does it matter? Climate change challenge

- World is recording the hottest temperatures ever
 - July 2023 – Hottest month recorded
 - May be hottest time in at least 120,000 years
- Global effort to keep global warming & temperature rise to no more than 1.5 degree Celsius (2.7 degrees Fahrenheit) by 2100
 - Seek to limit global warming to “well below” **2 degrees Celsius** -- and to “pursu[e] efforts to limit” temperature increase **to 1.5 degrees C** compared to pre-industrial levels (under Paris/UN agreement)
 - Earth has already warmed about 1.2 degrees Celsius (2.2 degrees Fahrenheit). Warming above 1.5 degrees Celsius increases risk of triggering major tipping points.

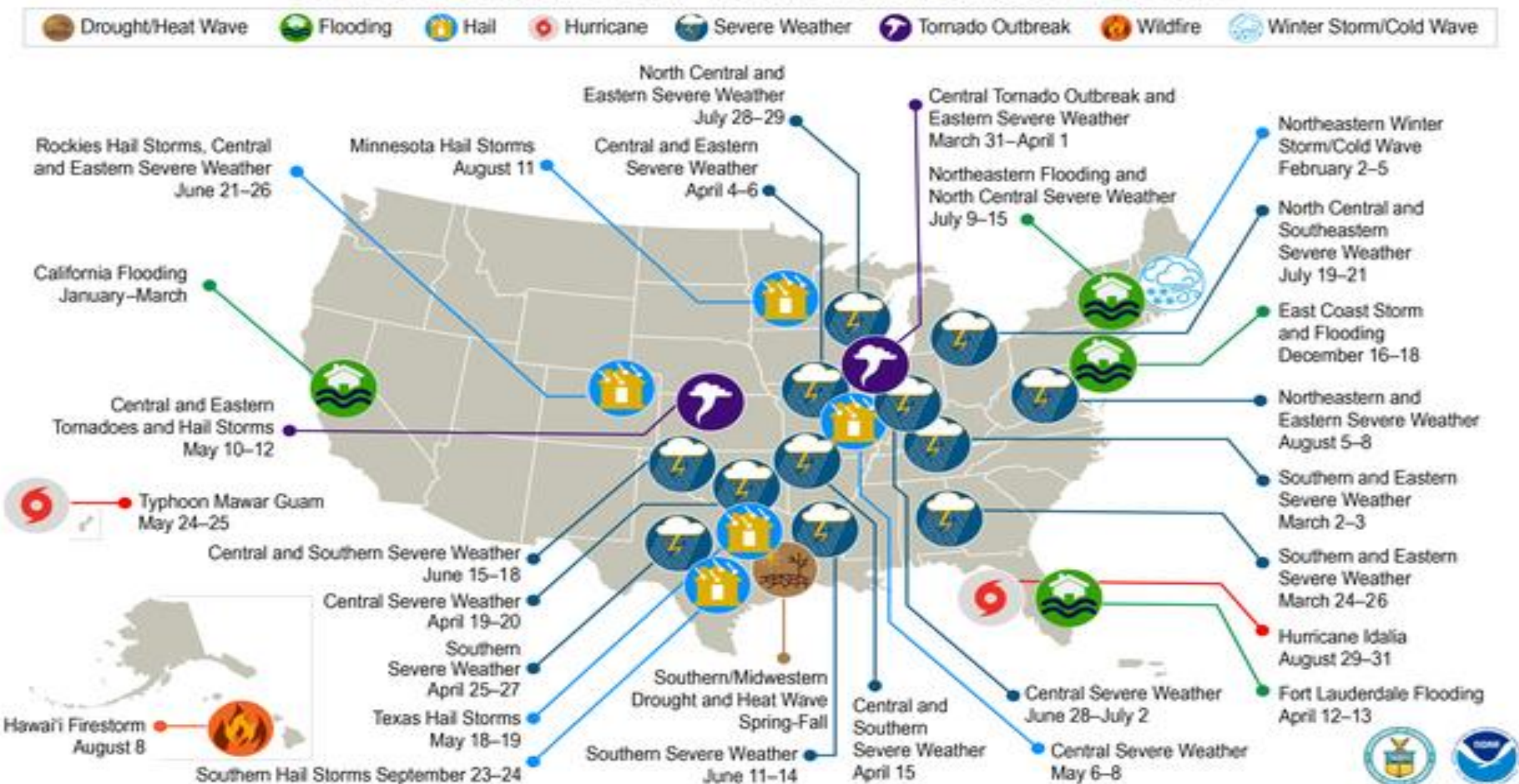


U.S. 2022 Billion-Dollar Weather and Climate Disasters



*This map denotes the approximate location for each of the **18 separate billion-dollar weather and climate disasters** that impacted the United States in 2022.*

U.S. 2023 Billion-Dollar Weather and Climate Disasters



This map denotes the approximate location for each of the 28 separate billion-dollar weather and climate disasters that impacted the United States in 2023.

U.S. 2024 Billion-Dollar Weather and Climate Disasters



Drought/Heat Wave



Flooding



Hail



Hurricane



Severe Weather



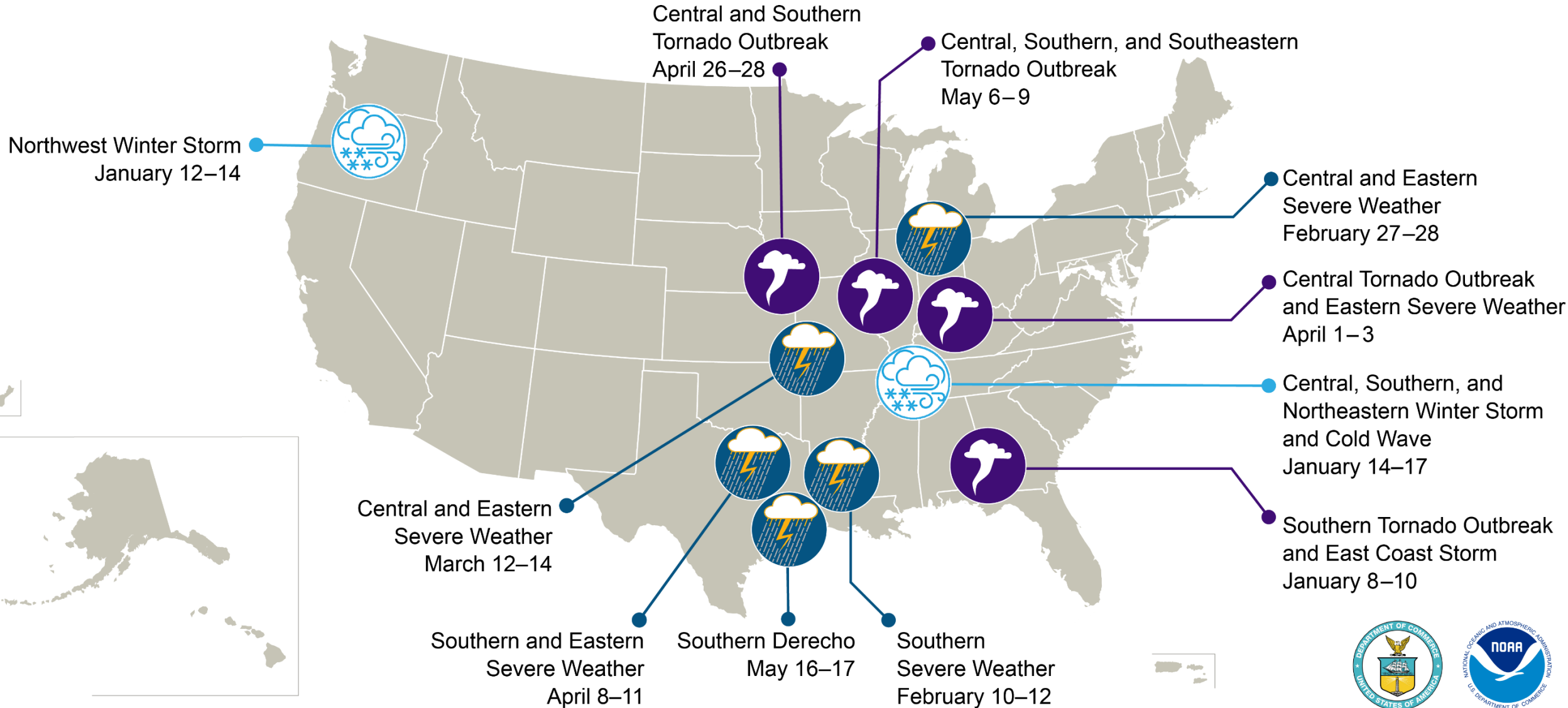
Tornado Outbreak



Wildfire



Winter Storm / Cold Wave



*This map denotes the approximate location for each of the **11 separate billion-dollar weather and climate disasters that impacted the United States through May 2024.***

Major legislation & actions



Admin

Executive Order on Tackling the Climate Crisis at Home and Abroad

JANUARY 27, 2021 • PRESIDENTIAL ACTIONS

The United States and the world face a profound climate crisis. We have a narrow moment to pursue action at home and abroad in order to avoid the most catastrophic impacts of that crisis and to seize the opportunity that tackling climate change presents. Domestic action must go hand in hand with United States international leadership, aimed at significantly enhancing global action. Together, we must listen to science and meet the moment.

By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:

PART I – PUTTING THE CLIMATE CRISIS AT THE CENTER OF UNITED STATES FOREIGN POLICY AND NATIONAL SECURITY

Section 101. Policy. United States international engagement to address climate change – which has become a climate crisis – is more necessary and urgent than ever. The scientific community has made clear that the scale and speed of necessary action is greater than previously believed. There is little time left to avoid setting the world on a dangerous, potentially catastrophic, climate trajectory. Responding to the climate crisis will require both significant short-term global reductions in greenhouse gas emissions and net-zero global emissions by mid-century or before.

- **Biden administration goals:**

- By 2030, goal for EVs as half of new car sales
- By 2030, 500,000 EV charging stations/ports
- By 2030, 50-52% CO2 reductions from 2005
- By 2050, seek to achieve net zero

- **Major federal legislation:**

- Bipartisan Infrastructure Law (2021) - \$1.2 trillion
- Inflation Reduction Act (2022) - \$369 billion (energy/climate funding) if not more
- Combined effect of both bills & executive actions

Action by States & others

- A number of states have been active
 - By 2035, all new passenger cars and trucks sold to generally be zero-emission; does not ban current autos (Advanced Clean Cars II rule)
 - California, Oregon & Washington State
 - Maryland, MA, NY, Rhode Island & Vermont
 - Up to about 17 states
 - Based on California standards
- Environmental groups & local governments
 - Focusing on “Superusers” of gasoline & EV switch
 - Some advocating against new gas stations in some places
 - Top 10 % of U.S. drivers use almost 1/3 of gasoline

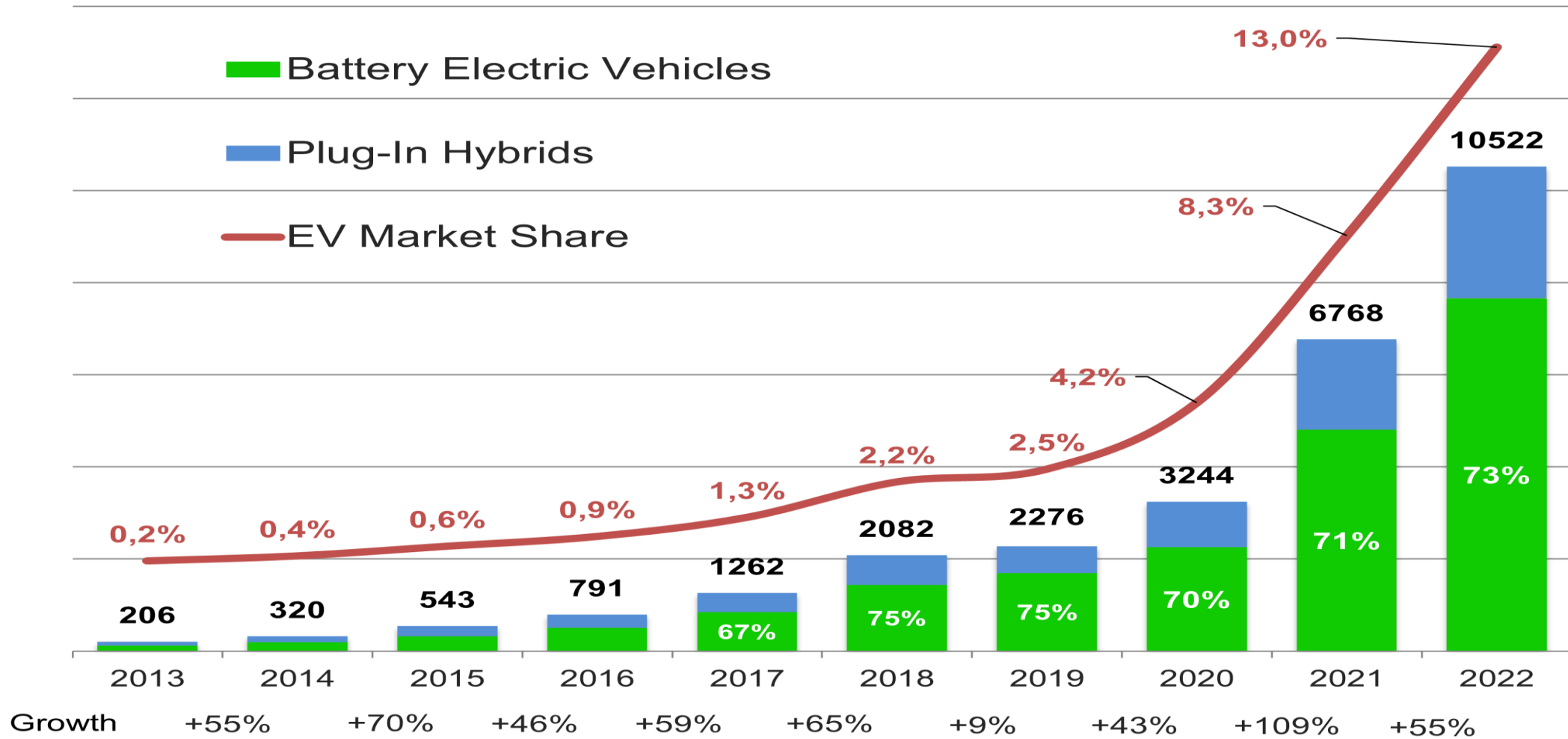
EVs & EV charging network

- *Huge need for expanded EV charging network*
 - By 2030, to support 33 million EVs on road (NREL), 28M EV charging ports will be needed to support them – Need to significantly increase number of DC fast, other ports
 - Over 140,000 public EV charging ports – Need to increase 4X, 5X or more
 - 8,200 public fast-charging stations currently – 1 for every 15 gas stations
 - Can take less than 1 hour to charge up to 80%

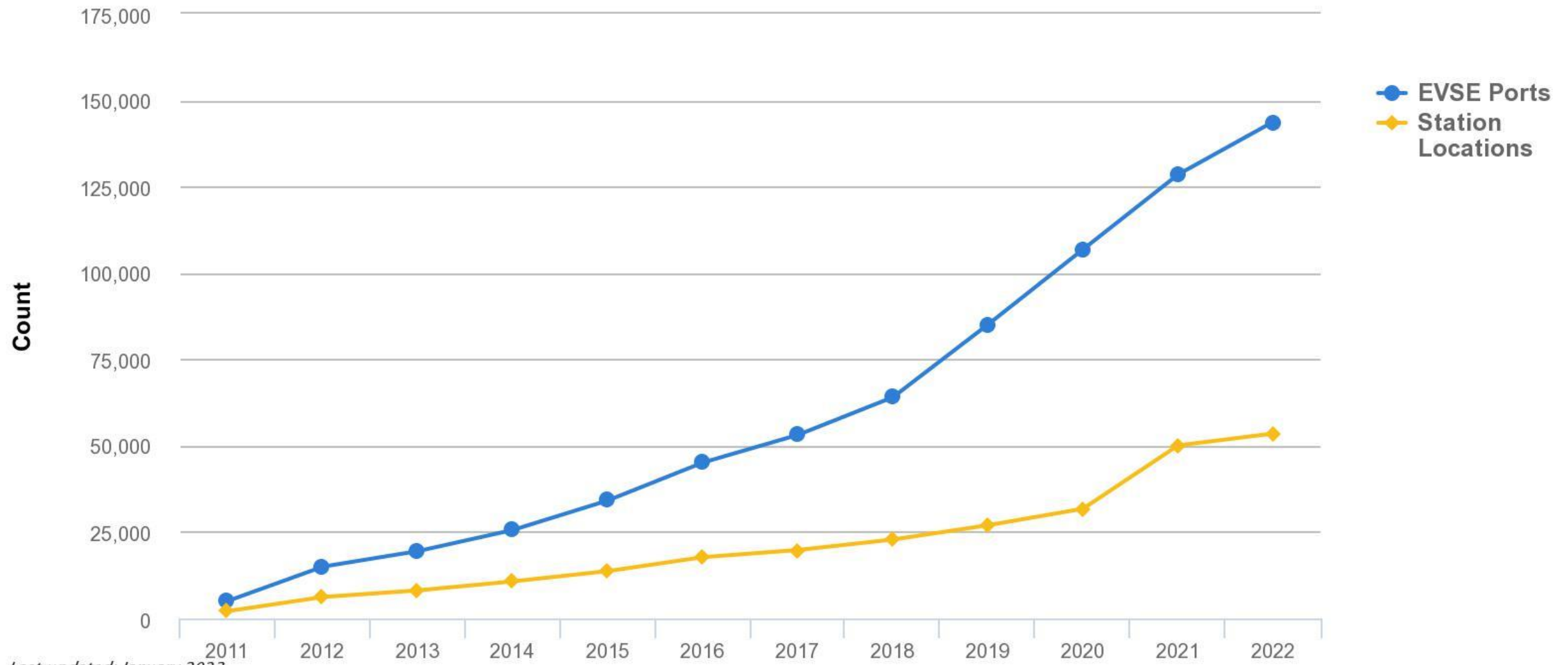


GLOBAL BEV & PHEV SALES ('000s)

EV VOLUMES



U.S. Public and Private Electric Vehicle Charging Infrastructure

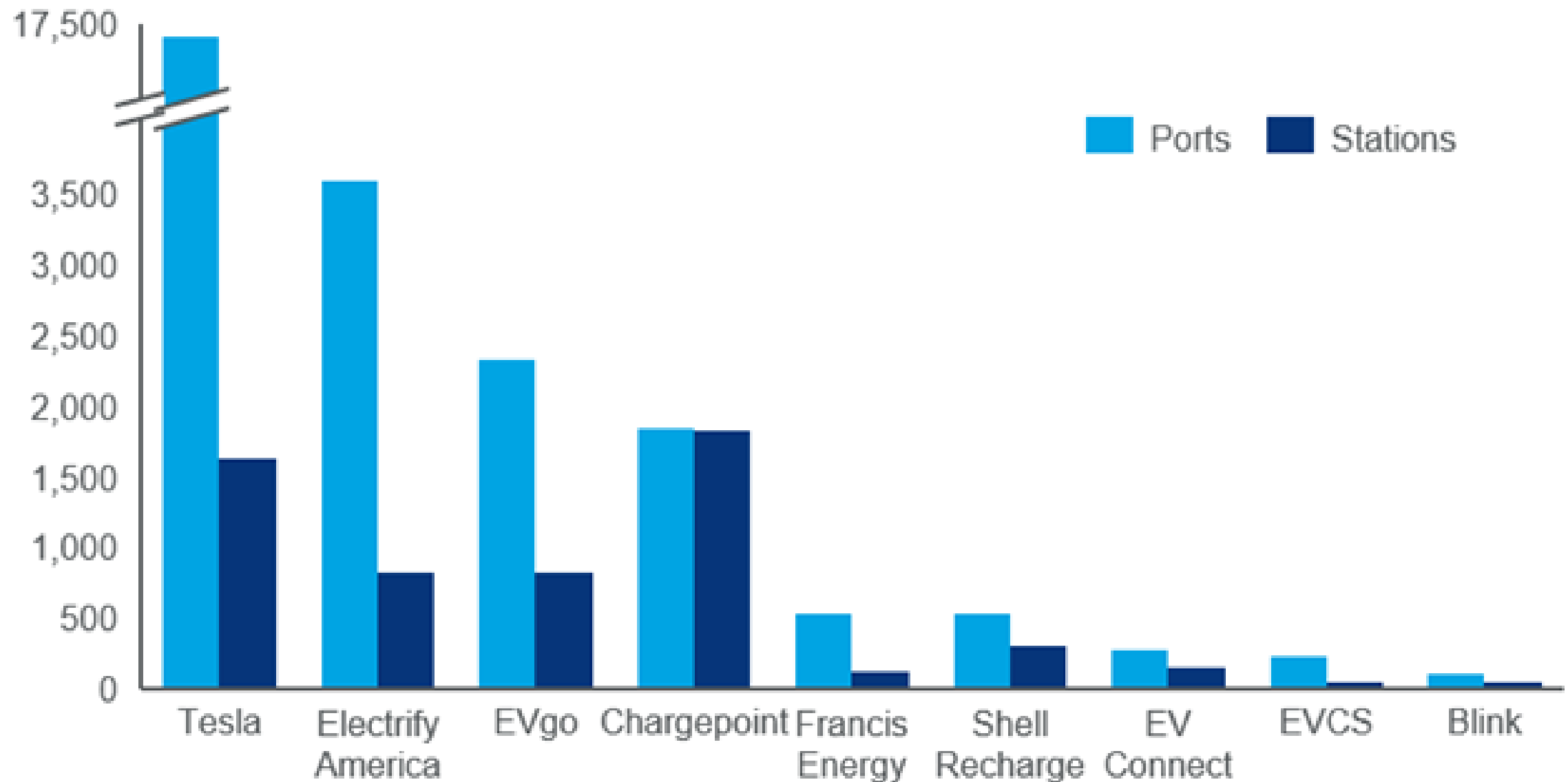


Last updated: January 2023

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Source: [Alternative Fuels Data Center](#)

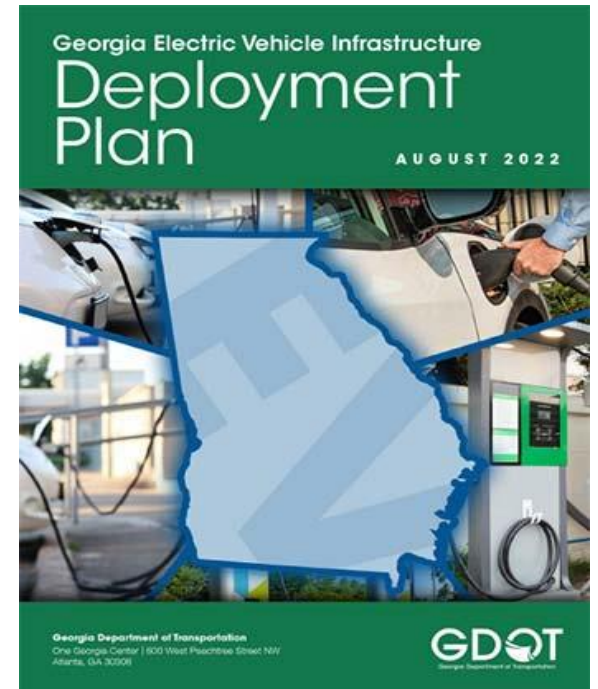
DCFC ports and stations by charging network in the US



Source: Wood Mackenzie Grid Edge Service, [Alternative Fuels Data Center](#)

More - EV charging network

- **Bipartisan Infrastructure Law (BIL)** - \$7.5 billion to develop & expand U.S. EV charging stations
 - Approx. \$5 billion provided through federal National Electric Vehicle Infrastructure (NEVI) program
 - BIL funding provided to states
 - States prepare/provide EV Infrastructure Plans
 - Administered by Federal Highway Admin.
 - Differences between states



EV charging network

- **NEVI program**

- Federal review and approval of state plans to distribute federal NEVI funds
- Develop EV chargers:
 - At least 1 station every 50 miles along alternative fuel corridors
 - Less than 1 mile off the exit
 - Accessible to public 24 hours a day
 - At least four (4) EV ports per station
- Strategy to fill gaps in DC fast charging
- **Goal: Fast, reliable, and accessible**



Effect on gasoline use

- In U.S. aggregate gasoline consumption declined by 0.54% in 2021
- 2024 - U.S. Energy Information Administration (EIA) expects gasoline demand to fall by 1% in 2024 - would be lowest per-capita gasoline consumption in 2 decades
 - EIA forecasts average person in U.S. will use 402 gallons of gasoline in 2024, down from a peak of 475 gallons per person in 2004
- Substantial per capita gasoline consumption decreases:
 - 15% decrease since 2003
 - Fuel economy increased over 40% over past 2 decades
- Complex, mixed set of gasoline data
- Overall trend is continued lower per capita use



-- *Effect on gas stations* --



- Estimated approx. 145,000 gas stations in U.S.
 - Down from more than 200,000 gas stations in 1994
 - About 300,000 in the 1920s
- National Association of Convenience Stores (2024): Approx. 120,000 C-stores selling fuel in U.S., out of more than 152,000 C-stores
- **Dunec (FTI)**:
 - Estimates 50% of U.S. gas stations may be gone by 2030 (2019 estimate)
- **Boston Consulting Group**: Between 25% - 80% of retail fuel market could be unprofitable in 15 years (2019)



-- *Effect on gas stations* --



- Approx. 80% of EV charging happens at home
 - EV charging may be less appealing for in-town gas stations
- More suited for longer-term use/stay at locations
 - Longer trips, longer stays at EV charging sites
- More than 50% of new NEVI-funded EV charging stations
 - Occurring at gas stations & truck stops
- EV adoption is not evenly distributed
 - Location nuances; significant differences between states (top per 10,000 – CA, Hawaii, WA; lower – ND, Miss., WV)

-- *Effect on gas stations* --

- Some C-stores (Buc-ee's, Sheetz, Wawa, Royal Farms) that serve as gas station operators are also adding EV chargers
- Circle K plans EV charging at 200 locations in N. America
- Mercedes Benz fast EV charging at Buc-ee's – plans to have EV charging at about 30 Buc-ee's by end of 2024; plans for 2,500 ports by 2027
 - Already Tesla EV charging at Bucc-ee's
- TravelCenters of America plans 1,000 chargers at 200 locations over 4-5 years (partnership with Electrify America)
- Trend toward integrating/combining EV charging into existing gas stations & C-stores as players figure out the space
- *Overall, this will take longer to play out . . .*

Gas stations & Brownfields

- Hundreds of potential additional Brownfield sites
- Per U.S. EPA, 50% of approximately 450,000 U.S. Brownfields may be affected by petroleum contamination; opportunity as to their future & redevelopment



Electrify America's “*Charging Station of the Future, Today*”

- No convenience store features planned for now
- May include customer lounges & amenities
- First stations in CA
- Up to 20 ultra-fast chargers; with overhead solar awnings



Examples of Electrify America charging stations

- More than 820 EV charging stations across U.S.
- Photo to right is in Santa Clara, CA – All DC fast charging



Reimagining gas & charging stations – What next generation could look like





Sources

- NOAA publicly available information
- NREL publicly available information
- U.S. DOE publicly available information
- Cox Automotive
- Sources noted in slides