

Federal Fleets: Zero-Emission Vehicle Implementation

GAO-23-105350

Report to Congressional Requesters

July 19, 2023

Why This Matters

The Biden Administration issued Executive Order 14057 (the Order), and the accompanying *Federal Sustainability Plan*, in December 2021 setting a range of goals to reduce emissions across federal procurement and operations. A key goal of the Order is for executive agencies to transition their fleets to zero-emission vehicles (ZEV).¹ A ZEV is any vehicle that, when operating, produces zero tailpipe exhaust emissions of certain pollutants or greenhouse gases, such as an electric vehicle. The Executive Order requires all acquisitions of light-duty vehicles (e.g., sedans, smaller sport utility vehicles, and smaller pick-up trucks) to be ZEVs by the end of fiscal year 2027; it requires all vehicle acquisitions to be ZEVs by 2035. The Order affects approximately 380,000 vehicles within federal fleets as they become subject to replacement, and represents a significant transformation in the federal government's approach to vehicle procurement.² For example, we reported in 2022 that federal agencies subject to the Order replaced or acquired about 45,000 vehicles in fiscal year 2021, and of those, about 260 were considered zero-emission.³

We were asked to examine key considerations of the federal transition to ZEVs. This report describes the first steps agencies subject to the Order have taken, or are planning to take, including preparing their federal workforce, assessing their fleets, and expanding their charging infrastructure. It also focuses on agencies' Zero-Emission Vehicle Fleet Strategic Plans (ZEV Strategic Plans)—plans that outline the fleet transition strategies of agencies with a fleet of at least 20 vehicles. As of March 2023, 26 of 30 plans had been approved by the Council on Environmental Quality (CEQ) and the Office of Management and Budget (OMB), representing over 99 percent of all vehicles within affected federal fleets.

Key Takeaways

- Agencies have begun to organize and train their workforces to implement ZEVs into their fleets.
- Agencies have begun to optimize their fleet management by assessing their fleets to determine where ZEVs can meet vehicle mission needs. The agencies with the 26 approved ZEV Strategic Plans also set a fiscal year 2023 ZEV acquisition target of almost 9,500 light-duty vehicles.
- Agencies have begun to expand their charging infrastructure by conducting site assessments to understand the potential considerations needed to support increased electrification. The agencies with 26 approved plans also set a fiscal year 2023 installation target of over 8,500 charging ports.⁴

Background

There are three types of vehicles that can be classified as zero-emission: (1) battery electric vehicles, which are powered solely by a battery on board; (2) plug-in hybrid electric vehicles, which are powered by a combination of a battery on board and a gasoline engine; and (3) fuel cell electric vehicles, which are powered by the conversion of hydrogen to electricity.⁵ Electric vehicles, in particular, can help improve fuel economy, lower fuel costs, and reduce emissions. Because battery electric and plug-in hybrid electric vehicles generally rely on batteries, infrastructure (i.e., charging equipment) is needed to safely deliver energy from the electric grid to a vehicle's battery. For fleets adopting electric vehicles, officials from the General Services Administration (GSA) said that this generally starts with charging equipment at fleet facilities where three options typically exist: Level 1, Level 2, and DC fast charging. The type of charging equipment needed at a given facility generally depends on the types of ZEVs the agency is acquiring, or planning to acquire, for use at that facility and their operating characteristics (e.g., overnight parking, miles driven per day, etc.). For example, battery electric vehicles, which usually have larger batteries, may require Level 2 charging for overnight charging while many plug-in hybrids may be able to rely entirely on Level 1 charging.⁶

Implementing ZEVs into federal fleets will require federal agencies to shift perceptions about their capability to adequately meet mission needs in terms of performance and driving range. Our prior work has also shown that the process of fully implementing such major transformations can span several years and must be carefully managed.⁷ *The Federal Sustainability Plan* establishes the federal government as a leader in clean transportation and outlines six key actions to help agencies navigate this transformation, including:⁸

- **Improving the workforce's understanding of ZEVs.** As with any new technology, lack of knowledge and experience can hinder adoption. Training of federal agency personnel will be necessary and critical to success.
- **Optimizing agency fleet management.** Agencies will acquire ZEVs for all new vehicle acquisitions where GSA offers one or more ZEV options for that class of vehicle.
- **Expanding vehicle fleet charging infrastructure.** To support ZEV deployment, increased access to electric vehicle charging equipment is critical.

What are agency roles and responsibilities for implementing Executive Order 14057?

Executive Order 14057 tasked CEQ and OMB to lead federal efforts to transition affected agency fleets to ZEVs. Accordingly, as required by the Order, CEQ issued *Implementing Instructions for Executive Order 14057* (Implementing Instructions) and OMB issued a memorandum, *Catalyzing Clean Energy Industries and Jobs through Federal Sustainability* that provide further requirements to meet the policies and goals of the Order.⁹

The Department of Energy (DOE) and GSA also play an integral role in providing leadership and helping agencies meet applicable fleet energy requirements, such as those set forth in the Order. For example, DOE developed its *ZEV Ready* framework to guide and support federal fleet stakeholders through the process to electrify each fleet location. This Framework provides a 15-step roadmap, that once completed, will ensure that the location is ready to acquire ZEVs. These steps range from defining team roles, responsibilities, and training needs to identifying candidate vehicles for electrification to designing ZEV charging solutions specific to site characteristics. See Table 1 for more information on agencies' roles and responsibilities during the transition.

Table 1: Selected Roles and Responsibilities for Implementing Executive Order 14057

Agency	Roles and responsibilities
Executive agencies	<ul style="list-style-type: none">• Agencies must propose targets—including annual progress targets where applicable—to meet the Executive Order’s goals and requirements for Zero-Emission Vehicle (ZEV) acquisition and charging equipment deployment.• Agencies with 20 or more vehicles must annually develop and submit to the Council on Environmental Quality (CEQ) a data driven strategic plan (ZEV Strategic Plan) that includes proposed annual ZEV acquisition and charging equipment deployment targets, among other things.• Agencies must issue or revise existing agency policies, directives, and guidance, as appropriate, including employee training.
CEQ and the Office of Management and Budget (OMB)	<ul style="list-style-type: none">• CEQ and OMB will review and approve agencies’ proposed targets for ZEV acquisition and charging equipment deployment and, where applicable, ZEV Strategic Plans.• CEQ will coordinate with OMB, DOE, and GSA to provide agencies with ZEV and charging equipment acquisition and deployment tools and fleet data management systems, as well as employee training, to enable effective charging equipment planning and deployment.
The Department of Energy (DOE) and the General Services Administration (GSA)	<ul style="list-style-type: none">• GSA and DOE, in coordination with CEQ, must develop a coordinated and comprehensive training and education plan for personnel involved in fleet acquisition or operation that addresses ZEV and charging equipment planning, prioritization, and operation.• DOE, in coordination with CEQ and OMB, must provide tools and technical support to assist agencies in developing ZEV acquisition and charging equipment deployment targets.• GSA is generally the mandatory source for the purchase of new vehicles and agencies should purchase ZEV charging equipment through GSA’s blanket purchase agreements. GSA must also issue guidance and best practices for charging equipment deployment at GSA facilities.

Source: GAO analysis of Executive Order 14057, CEQ, *Implementing Instructions for Executive Order 14057* (Aug. 2022). | GAO-23-105350

Note: Executive Order 14057 only applies to acquisitions by executive agencies, as defined by 5 U.S.C. § 105, excluding independent regulatory agencies, as defined in 44 U.S.C. § 3502(5). The U.S. Postal Service, which has a significant number of vehicles, is not subject to the Executive Order, because under 5 U.S.C. Chapter 1, it is excluded as an independent establishment, and therefore is not an executive agency.

How are CEQ, OMB, GSA, and DOE assisting agencies with planning for the transition to zero-emission vehicles?

CEQ, OMB, GSA, and DOE have provided tools and established policies to assist agencies as they plan their transitions to ZEVs. In 2021, agencies began using the ZEV Planning and Charging Tool (ZPAC), developed by CEQ, DOE, GSA, and OMB, in part, to identify where available ZEVs—including battery electric and plug-in hybrid electric vehicles—could meet mission needs. The ZPAC tool was designed to predict a certain level of electrification generally achievable by agencies given their current fleet profile, and was pre-populated with information from the Federal Automotive Statistical Tool (FAST), the only government-wide source of fleet data.¹⁰ For example, based on data available in the ZPAC tool, one agency found that about 42 percent of its potential fiscal year 2022 light-duty vehicle acquisitions were either “Great” or “Good” candidates for a ZEV, assuming a sufficient budget to acquire the vehicles.¹¹

CEQ officials said that they will not require agencies to complete a subsequent ZPAC tool. However, DOE (who maintains the tool) will continue to update it and offer it to agencies at their request to assist with their vehicle level decision-making. To assist agencies in developing annual targets for future ZEV Strategic Plans, CEQ and DOE developed and provided the ZEV & Electric Vehicle Service Equipment Ramp Rates Tool—which helps agencies estimate future

acquisitions and projected costs. This new tool will help agencies look beyond immediate vehicle level decisions and plan how they will ramp up to the Order's 2027 and 2035 requirements, according to CEQ officials.

In addition, DOE and GSA, in coordination with CEQ and OMB, are leading efforts to improve vehicle-level data for federal fleets. For example, beginning no later than the fiscal year 2024 reporting cycle, DOE is required to update FAST reporting to capture data necessary for tracking ZEV acquisition and operations. This, in turn, may assist agencies in making more informed decisions for the upcoming procurement cycles. As we reported in 2022, FAST may not be detailed or consistent enough to provide accurate and reliable vehicle-level analyses, such as day-to-day use.¹² GSA officials said that the accuracy and completeness of the data is a reflection of the data provided by agencies.

According to CEQ's Implementing Instructions, GSA policy requires telematics on all newly acquired GSA-leased vehicles for the federal government and it intends to install telematics on all preexisting leased vehicles by 2026.¹³ Telematics can track the operational data on a vehicle, such as driver behavior, fuel use, and idling, among other variables. This increased use of telematics should help agencies improve their data and make more informed decisions. As of January 2023, the Environmental Protection Agency (EPA), the Department of Homeland Security (DHS), the Department of Agriculture (USDA), and the Department of Transportation (DOT) had installed telematics in about 26 percent, 62 percent, 29 percent, and 21 percent of their fleets, respectively.

What steps have agencies taken, or plan to take, to prepare the federal workforce for zero-emission vehicles?

To prepare the federal workforce for a transition to ZEVs, agencies affected by the Order have generally (1) established teams to manage the transition, (2) begun organizing key site stakeholders, and (3) begun planning to train their workforce on a range of issues related to ZEVs. We selected four agencies for a more detailed review of their ZEV transition—DHS, EPA, DOT, and USDA. We found that all four agencies have established teams to manage the transition. Officials from CEQ said that most agencies have developed similar teams, although the structure and formality of these teams may vary. For example, DHS established a new Fleet Electrification Program Management Office that realigned existing staff to coordinate and centrally manage the ZEV transition across the agency, while other agencies assigned transition responsibilities to existing offices.

Some agencies have also begun to organize the key site stakeholders involved in the transition, which include local fleet managers, facility managers, energy managers, and site leadership. While, some of these officials have not previously been involved in fleet decision-making, according to CEQ, they will play an important role in deploying ZEVs and charging solutions. For example, two of the four selected agencies have taken the initial steps to provide guidance for coordination between these stakeholders.

Our prior work also found that the workforce is at the core of any serious change management initiative.¹⁴ Executive Order 14057 required agencies to foster a culture of sustainability and climate action and build employees' skills and knowledge through engagement, education, and training. For example, CBP officials said that the government must address and prepare for the cybersecurity concerns associated with connected vehicles and chargers.

Based on our analysis of the 26 ZEV Strategic Plans, we found that all but one of the agencies described a plan to offer a range of ZEV-related trainings to their workforce. We found dozens of resources available through DOE and GSA, ranging from seminars to gain familiarity with ZEVs to more complex trainings, on

issues such as combatting cybersecurity threats. See Table 2 for some examples of trainings currently offered by DOE and GSA.

Table 2: Example of Zero-Emission Vehicle (ZEV) Trainings Offered by the Department of Energy and the General Services Administration

Transition Area	Examples of Trainings
Fleet Planning	<ul style="list-style-type: none"> Calculating a vehicle’s total projected cost of ownership. Assessing the benefits and tradeoffs involved in adopting ZEV technology. Using the ZEV Planning and Charging Tool.
Design Charging Solutions	<ul style="list-style-type: none"> Providing detailed information on the capability and requirements of the various charging equipment models. Working with local electric utility partners to design a ZEV charging approach.
ZEV Deployment	<ul style="list-style-type: none"> Instructing personnel on how to drive ZEVs to maximize performance and battery life. Advising personnel on charging equipment cybersecurity and resilience.

Source: GAO analysis of DOE and GSA information. | GAO-23-105350

In our review of the 26 ZEV Strategic Plans, we identified other efforts agencies are making to prepare their workforce for the transition, including:

- Agency and Interagency Working Groups.** Ten of the 26 plans described the creation of agency- or component-wide working groups to bring together ZEV stakeholders, provide training, and encourage adoption of leading practices. For example, the Federal Aviation Administration (FAA) established an internal website that provides detailed information related to ZEVs, such as charging equipment specifications, and conducts monthly teleconferences to provide information to staff. Ten of the 26 plans also identified interagency working groups, such as the Federal Electric Vehicle Agency Roundtable—an interagency group that meets regularly to discuss issues related to ZEVs—as a resource for fleet and facility managers.
- Culture Change.** Ten of the 26 plans described efforts to address concerns among vehicle operators about the capability of ZEVs to perform agency missions. Within the plans and in discussions with our selected agencies, some agencies described using pilot programs, small scale roll-outs, and other technical demonstrations to engage employees and build confidence in the transition. For example, Forest Service officials told us that they plan to circulate ZEV pickup trucks among employees at three locations so a wide range of operators can become familiar with ZEV technology and provide feedback to leadership on ZEV deployment.

What steps have agencies taken, or plan to take, to manage ZEV acquisitions?

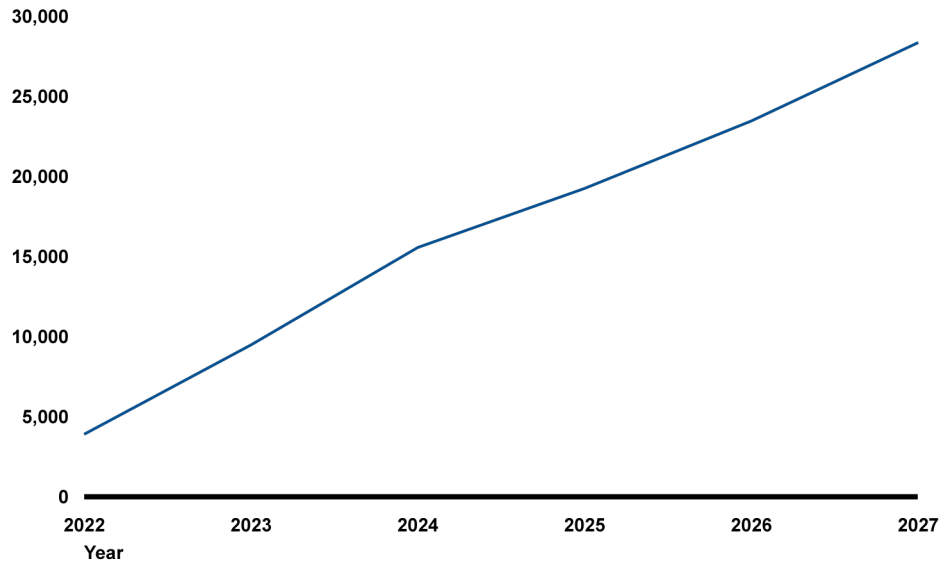
Agencies affected by the Order have begun to assess their fleets and set targets to acquire ZEVs, but challenges could limit their vehicle acquisitions in the short-term. After completing the first iteration of ZPAC, and with the assistance of the ZEV & Electric Vehicle Service Equipment Ramp Rates Tool, the 26 agencies with approved strategic plans set targets to acquire a combined total of about 9,480 light duty ZEVs in fiscal year 2023. Meeting this target, however, is contingent on a number of factors, such as whether sufficient funding is available and mission-appropriate vehicles are available from vehicle manufacturers.

Officials from all four of the selected agencies said that, in the short-term, they plan to generally prioritize the acquisition of ZEVs to replace vehicles considered “low-hanging fruit” from those due for replacement. Generally, these are vehicles that are identified by the fleet assessments as suitable to replace with a ZEV, have a current equivalent ZEV model available, and are located at sites with other strong ZEV candidates. For example, officials from FAA said that many of

their passenger vehicles used for administrative roles meet this criteria. For more information on acquisition targets developed by agencies as part of their ZEV Strategic Plans for the next 5 years see Figure 1.

Figure 1: Combined Annual Agency Targets for Zero-Emission Vehicle (ZEV) Acquisitions, 2022 to 2027

Target number for light duty vehicles



Source: GAO analysis of 26 fiscal year 2022 Zero-Emission Vehicle Fleet Strategic Plans. | GAO-23-105350

Data table for Figure 1: Combined Annual Agency Targets for Zero-Emission Vehicle (ZEV) Acquisitions, 2022 to 2027

Year	Targeted Number of Light Duty Vehicles
2022	3900
2023	9477
2024	15561
2025	19248
2026	23462
2027	28354

Source: GAO analysis of 26 fiscal year 2022 Zero-Emission Vehicle Fleet Strategic Plans. | GAO-23-105350

In our review of the 26 ZEV Strategic Plans, we found agencies reported two key challenges specifically related to the acquisition of vehicles:

- **Limited Vehicle Quantities Available.** Seventeen of the 26 plans reported that limited numbers of vehicles available from manufacturers was a challenge in meeting their targets. For example, DOT officials told us they initially wanted to order 430 ZEVs for fiscal year 2022 but GSA scaled their order back to 292 due, in part, to order cancellations from manufacturers. DOE officials told us that, overall, they estimate that about 25 percent of agency fiscal year 2022 ZEV orders were able to be acquired in fiscal year 2022, but expect an increased supply of ZEVs for federal acquisition in fiscal year 2023 and beyond. GSA recognizes that these cancellations have been a challenge for agencies and is updating its ordering process. GSA officials also said that many of these cancellations could be attributed to situations where suppliers did not offer the models that they initially told GSA they would or did not offer them in the quantities agencies needed.
- **Limited Vehicle Models Available.** Fifteen of the 26 plans identified the lack of available ZEV models that could perform mission needs as a potential

challenge to meeting their targets. As we reported in 2022, larger models of SUVs and pickup trucks, which some agencies need to complete their missions, have not been commercially available.¹⁵ However, according to estimates DOE provided to agencies to help them set their ZEV acquisition targets, DOE expects vehicles of these types to generally be available starting in 2024.¹⁶ Customs and Border Protection (CBP) officials told us that while they are confident about being able to use ZEVs in administrative roles, they do not believe that current ZEV technology can support law enforcement equipment or perform law enforcement missions in extreme environments, such as those on the borders. According to CBP officials, they are developing a technical demonstration to evaluate the performance of their current ZEVs under a range of conditions and scenarios.

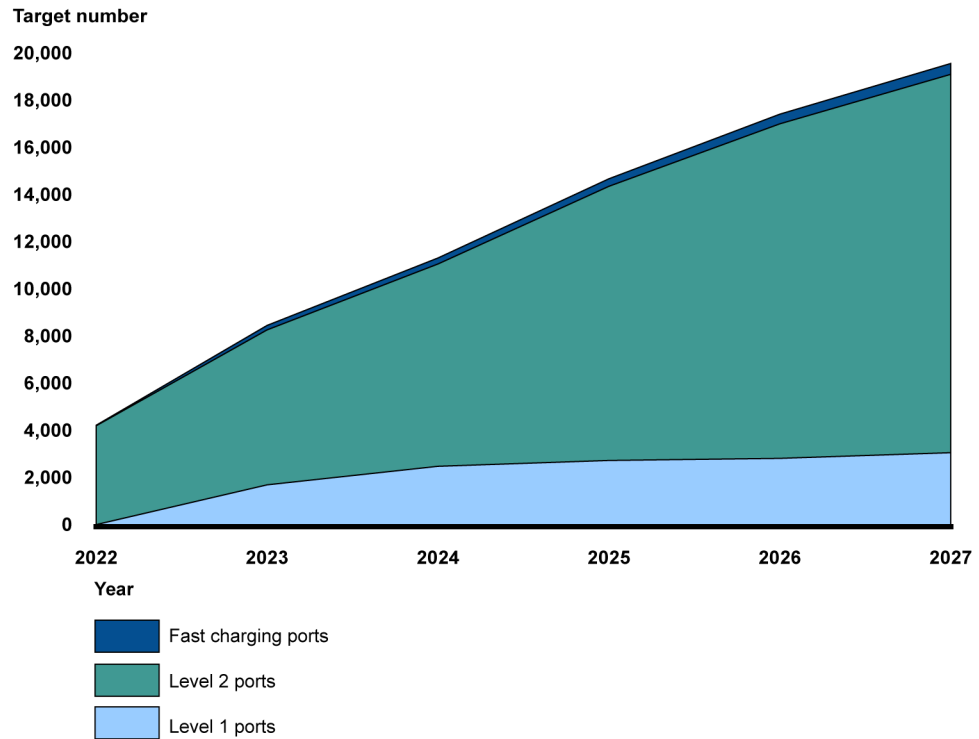
What steps have agencies taken, or plan to take, to expand charging equipment at federal facilities?

Agencies affected by the Order have begun to conduct site assessments at a limited number of facilities and have set annual charging equipment installation targets. Site assessments involve facility staff discussing fleet acquisition plans and workplace charging needs for personally owned vehicles, and then reviewing parking locations and electrical infrastructure. Site assessments can help inform recommendations for the numbers, types, and locations of the charging necessary to support the fleet in the coming years. Based on our review of the 26 ZEV Strategic Plans, in fiscal year 2022, agencies initiated about 550 sites assessments—this includes designing the assessment or researching pricing—and plan to conduct an additional 1,781 assessments.

Many agencies have also prioritized expanding their charging equipment while they wait for more models and an increased supply of ZEVs, according to CEQ officials, as this equipment needs to be in place before a site can operate them. DOE has advised agencies, when assessing charging equipment needs, to plan to install enough equipment at a facility to support ZEV acquisitions as far as five years into the future. One DOE complex, for example, has installed more than 40 charging ports despite only having a handful of ZEVs in its fleet so it can support expected ZEV orders over the next two to three years.

As agencies prioritize charging and conduct site assessments, the 26 plans we reviewed outlined intentions to install 8,536 charging ports in fiscal year 2023—77 percent of which are Level 2—and a total of over 76,000 ports over a six year period.¹⁷ For more information on charging installation targets see Figure 2.

Figure 2: Agency Charging Ports Installation Targets by Year (2022-2027)



Source: GAO analysis of 26 fiscal year 2022 Zero-Emission Vehicle Fleet Strategic Plans. | GAO-23-105350

Data table for Figure 2: Agency Charging Ports Installation Targets by Year (2022-2027)

Year	Target Number of Level 1 Ports to Install	Target Number of Level 2 Ports to Install	Target Number of Fast Charging Ports to Install
2022	88	4191	23
2023	1774	6572	190
2024	2561	8581	255
2025	2809	11627	320
2026	2898	14188	410
2027	3138	16048	460

Source: GAO analysis of 26 fiscal year 2022 Zero-Emission Vehicle Fleet Strategic Plans. | GAO-23-105350

Note: Level 1 charging equipment, the simplest charger that plugs into a standard outlet, provides about 5 miles of range per hour charged and requires no additional infrastructure. Level 2 charging equipment can generally provide 25 miles of range per 1 hour of charging. Fast chargers can provide more than 200 miles of range in 30 minutes, but are generally more costly.

The 26 agencies reported three key challenges in their approved ZEV Strategic Plans that may hinder their installation goals—electrical capacity limitations, costs, and leased properties.

- Electrical Capacity Limitations.** Ten of 26 plans reported concerns that as fleet electrification progresses, it will become more difficult to supply the minimum electrical current necessary for larger numbers of Level 2 or DC fast chargers. For example, EPA’s strategic plan identified 59 such facilities that deploy up 824 vehicles. Similarly, GSA officials said that many of their buildings have varying degrees of electrical capacity and they are uncertain if some buildings have the additional electrical capacity needed to support the charging equipment for its internal fleet, which operates 730 vehicles across more than 300 locations. If a facility is found to have an undersized existing power supply—which can be identified via coordination with the local utility provider—it may require a utility to install and expand the necessary electrical

infrastructure. CBP also said that many of their sites are in remote locations which can pose a challenge to supplying the necessary electricity—in such scenarios, “utility side upgrades” may come with substantial costs, much of which may be passed on to the agency involved. Accordingly, CEQ officials said that agencies should reach out to their utilities as soon as possible since potential infrastructure upgrades, in some extreme cases, may take years to install.

- **Costs.** Ten of 26 plans reported concerns about the potential costs associated with installing charging equipment. For example, these costs may include, but are not limited to, the site assessment, design, wiring, and trenching. A more straight forward installation of a Level 2 charging equipment (with two ports), according to GSA officials, may cost \$45,000 to \$50,000 on average, including the cost of the equipment. However, economies of scale could be achieved with more charging equipment being installed at the same time and location. GSA official noted that if major electrical upgrades are necessary, such a project could cost hundreds of thousands of dollars. The extent and cost of the facility upgrades necessary to support a fully ZEV fleet are uncertain until agencies conduct site assessments across all fleet locations. Such an endeavor will take time; for example, DHS operates vehicles out of over 3,000 locations.
- **Leased Space.** Ten of 26 plans reported concerns about their leased facilities. USDA’s strategic plan identified its leased properties as having unique challenges involving upfront installation costs, maintenance and associated costs, liability, and access, among others. FAA, for example, has selected 22 sites to begin deploying charging equipment. These sites were selected, in part, because they were not leased but owned by GSA or FAA—avoiding negotiations with any lessors, according to DOT officials. According to CEQ’s Implementing Instructions, agencies should use forthcoming GSA guidance to help navigate this challenge.

What did agencies estimate it may cost to meet ZEV and charging equipment targets?

To meet the fiscal year 2023 targets, agencies estimated in their 26 approved plans that they would need over \$470 million. This total represents almost \$200 million in estimated increased incremental costs (i.e., the price differential, if any, between the alternative fuel vehicle and the lowest-priced comparable gasoline-powered vehicle when leased from GSA) and almost \$300 million in estimated costs to design and install the necessary infrastructure, among other potential expenses. CEQ, however, could not confirm the accuracy of this estimation and CEQ officials stated that they are working with OMB to develop estimations to inform future administration budget requests.¹⁸ CEQ officials also said for fiscal year 2023, agencies received approximately a third of the total appropriations requested for the acquisition of ZEVs. They told us a similar situation occurred in 2022 that contributed to agencies not meeting their targets.

In August 2022, OMB revised Circular A-11 to include updated guidance for the content of agencies’ budget requests to reflect Executive Order 14057. OMB’s updated fleet data reporting guidance provides that to the extent possible, agencies’ fleet budget submission data and plan narratives should be consistent with their ZEV Strategic Plans. As agencies plan for the transition, some of the vehicle and infrastructure challenges identified above, such as costs, may be mitigated to varying degrees as the electric vehicle market evolves. For example, as we reported in October 2022, GSA officials said that they expect the difference in purchase price of electric vehicles compared to conventional gasoline vehicles to continue to decline as production increases and manufacturing costs decline—although they may not decline as rapidly as anticipated prior to the global pandemic.

What are other considerations for the federal transition to zero-emission vehicles?

As agencies continue to expand the deployment of ZEVs in fiscal year 2023 and beyond, in addition to costs and the other factors discussed above, they will need to take into account additional considerations—such as environmental justice and other sustainability initiatives. According to CEQ’s Implementing Instructions, environmental justice cuts across the goals of the Executive Order, in particular for fleets among others, and agencies should take it into account when prioritizing implementation actions. In our review of the 26 ZEV Strategic Plans, we found that less than half identified EPA’s Environmental Justice Screening and Mapping Tool as a resource to assist prioritizing sites for electrification. CEQ officials said they plan further address environmental justice in future iterations of the plans, and that moving forward, they are encouraging agencies to also use the Climate and Economic Justice Screening Tool, which was designed by CEQ in response to a requirement in Executive Order 14008.¹⁹

Finally, agencies have four other ambitious sustainability goals outlined in the Order beyond the transition to ZEVs. According to CEQ officials, the Council—in its leadership role—plans to integrate ZEV efforts into the Administration’s wider sustainability goals in an effort to accelerate the achievement of the Order’s goals through new avenues for external coordination. For example, the federal government is already the largest consumer of electricity in the nation—it spent more than \$4 billion on electricity in 2020—and the transition to electric vehicles will only increase its electricity use. The federal government, according to the *Federal Sustainability Plan*, will seek ways to pilot and accelerate the powering of federal facilities with carbon pollution free electricity, such as solar power, among other pathways to emission reductions, like net-zero emission federal buildings. We have current work describing the progress of some of these sustainability initiatives for federal facilities and, as part of our future work, we plan to describe, in more detail, the costs and benefits of using a ZEV in federal fleets compared to conventionally fueled vehicles.

Agency Comments

We provided a draft of this report to CEQ, DHS, DOE, DOT, EPA, GSA, OMB, and USDA for review and comment. CEQ, DHS, DOT, and GSA provided technical comments, which we incorporated as appropriate. The other agencies told us they had no comments on the draft report.

How GAO Did This Study

We reviewed Executive Order 14057, Executive Order 14008, OMB memorandum M-22-06 *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*, CEQ’s *Implementing Instructions for Executive Order 14057*, and the *Federal Sustainability Plan: Catalyzing America’s Clean Energy Industries and Jobs* to understand agency requirements, goals, roles, and responsibilities. We also reviewed previous GAO work on organizational change, but did not evaluate whether agencies were following these practices as part of this review. We reviewed documents from and interviewed officials and staff at CEQ, OMB, DOE, and GSA to understand their roles in supporting the agency transition and tools and guidance they developed to aid agencies.

In addition, we conducted interviews with officials at DHS, EPA, USDA, and DOT to provide more details on the transition, including how they have prioritized vehicles for replacement with ZEVs and any specific challenges the agencies faced. Because we determined that major agency components had significant responsibility for the transition at DHS, USDA, and DOT, we also conducted interviews with officials at CBP, Forest Service, and FAA. We selected these agencies to obtain perspectives from agencies with a range of fleet sizes and missions. We also considered the extent to which agencies already operated ZEVs.

To understand the targets agencies have set and the challenges they have reported encountering with regards to the transition, we reviewed the fiscal year 2022 Zero-Emission Vehicle Fleet Strategic Plans of agencies with a strategic plan that had received approval from CEQ by March 14, 2023. Of the 30 agencies required to complete a strategic plan, 26 agencies had an approved plan. These 26 agencies represent more than 99 percent of the total federal vehicles in non-postal domestic federal agency fleets.

We conducted this performance audit from July 2021 to July 2023 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives

List of Requesters

The Honorable Gary C. Peters
Chairman
Committee on Homeland Security and Governmental Affairs
United States Senate

The Honorable Jamie Raskin
Ranking Member
Committee on Oversight and Accountability
House of Representatives

The Honorable Gerald E. Connolly
Ranking Member
Subcommittee on Cybersecurity, Information Technology, and Government Innovation
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Endnotes

- ¹ The Executive Order only applies to acquisitions by executive agencies, as defined by 5 U.S.C. § 105, excluding independent regulatory agencies, as defined in 44 U.S.C. § 3502(5).
- ² The U.S. Postal Service, which has a significant number of vehicles, is not subject to the Executive Order, because under 5 U.S.C. Chapter 1, it is excluded as an independent establishment, and therefore is not an executive agency. For the purposes of our analysis, we also excluded agencies with fleets smaller than 20 vehicles because they were not required to develop Zero-Emission Vehicle Fleet Strategic Plans (ZEV Strategic Plan) under the Executive Order.
- ³ GAO, *Federal Vehicle Fleets: Observations on the Transition to Electric Vehicles*, GAO-23-105635 (Washington, D.C.: Oct. 20, 2022).
- ⁴ For the purposes of this report, charging equipment, which sometimes can be called a charging post, is the unit that houses one or more charging port. A port is the infrastructure that provides power and can charge only one vehicle at a time, although it may have multiple connectors. A connector is what is plugged into a vehicle to charge it.
- ⁵ As of 2022, only three fuel cell vehicles are offered by automakers, and supporting infrastructure only exists in California. Further, as of fiscal year 2021, there were no hydrogen fuel cell vehicles in federal agency fleets. The Office of Management and Budget (OMB) memorandum, M-22-06, that provides direction for agency compliance with Executive Order 14057 states that plug-in hybrid vehicles may be considered zero-emission for the purposes of meeting ZEV acquisition requirements. When running only on electricity, plug-in hybrid vehicles produce zero tailpipe emissions.
- ⁶ According to DOE, using Level 1 charging equipment, the simplest charger that plugs into a standard outlet, provides about 5 miles of range per hour charged and requires no additional infrastructure—this can charge a plug-in hybrid overnight. Standard Level 2 charging equipment can generally provide 25 miles of range per 1 hour of charging. For a plug-in hybrid, this mean it can take 1 to 2 hours to fully charge from empty, whereas for a battery electric vehicle, it can take 4 to 10 hours to fully charge from empty. A DC fast charger, on the other hand, can provide more than 200 miles of range in 30 minutes, but are generally more costly.
- ⁷ Our previous work identifies questions that Congress, OMB, and agencies can use to assess the development and implementation of agency reforms. GAO, *Government Reorganization: Key Questions to Assess Agency Reform Efforts*, GAO-18-427 (Washington, D.C.: June 13, 2018).
- ⁸ The other 3 actions are: (1) align financial planning for effective fleet planning, (2) seek state, tribal, and local government fleets opportunities to benefit from federal efforts, and (3) establish the ZEV Fleets Federal Leaders Working Group to drive strategy and implementation efforts that meet agency-by-agency targets and deployment planning. *Federal Sustainability Plan: Catalyzing America's Clean Energy Industries and Jobs* (Dec 2021).
- ⁹ CEQ, *Implementing Instructions for Executive Order 14057* (Aug. 2022); OMB, M-22-06, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability* (Dec. 8, 2021).
- ¹⁰ FAST is a fleet reporting tool that agencies populate with their information annually.
- ¹¹ More specifically, ZPAC was designed to help agencies estimate: (1) how many potential vehicles can be replaced with ZEVs in a given fiscal year 2022 and (2) the potential charging infrastructure needed to support potential ZEV acquisitions in fiscal year 2022 and additional ZEVs in coming years. However, it does not convey the lifetime costs of a ZEV or include a cost-benefit analysis of acquiring a ZEV.
- ¹² GAO-23-105635
- ¹³ All other agencies must deploy telematics on agency-owned vehicles on at least the same timeline to provide data necessary for consistent, comprehensive, and effective planning for ZEV acquisitions and deployment, and to facilitate overall fleet management, according to CEQ's implementing instructions.
- ¹⁴ GAO-18-427
- ¹⁵ GAO-23-105635
- ¹⁶ CEQ told us that ZEVs in the same class as an existing vehicle may not necessarily meet agency mission requirements.
- ¹⁷ DOE advises that agencies can save money and minimize the number of ports installed by instructing drivers to charge only when necessary (unless they plan on driving a long distance the following day) and using telematics data to inform deployment decisions. GSA officials also said that the number of ports per vehicle will depend on utilization of the vehicles and their driving patterns.
- ¹⁸ According to OMB officials, in general, agencies with existing appropriations authorities to purchase or hire passenger motor vehicles have sufficient authority to purchase or lease ZEVs and ZEV charging infrastructure.
- ¹⁹ Exec. Order 14008, *Tackling the Climate Crisis at Home and Abroad* (Jan. 27, 2021). CEJST has an interactive map and uses datasets that are indicators of burdens in eight categories: climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development. The tool uses this information to identify disadvantaged communities that are marginalized, underserved, and overburdened.