



**SMART ENERGY
DECISIONS**

2022 STATE OF VEHICLE FLEET ELECTRIFICATION

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A Note from NRG



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I'm a businessperson with a passion for electricity and bringing electric vehicles (EVs) to the industry. Some of this passion was shaped by a drive from the East Coast to Houston in 2018 in a Tesla. While I did this as a challenge for myself, the trip also gave me empathy for our customers as they navigate the transition to EVs.

I am very proud to work for NRG, a company that has reduced its carbon footprint by nearly 50%. Last year, we added a new goal to our overall sustainability framework, specifically to achieve 100% electrification for NRG's 1,100 light-duty vehicle fleet by 2030. I believe how we developed this goal and the roadmap to achieve it can be instructive to all organizations who are creating these plans for themselves.

NRG has two fleets: one for home services, which drives as many as 30,000 miles a year per vehicle, and one for its power plants, which logs about 5,000 miles per year. When we started the vehicle fleet electrification process in early 2021, we were surprised by what we found: 60% of the fleet was technically feasible to convert to EVs and 15% was also economically viable. Armed with that data, along with the ever-important net present value (NPV) to calculate return on investment (ROI), NRG approved that goal. I'm pleased to announce we are now in the initial stages of implementing our roadmap to reach fleet electrification.

In this second year of *The State of Vehicle Fleet Electrification* study, I was encouraged to see that respondents are farther along in their journeys to fleet electrification than they were just a year ago. Furthermore, organizations that have already implemented fleet electrification are reaping the benefits, including progress toward emission reduction goals, reduced fuel costs, and lower operating and maintenance expenses.

I invite you to contact me to continue the conversation started by this research. Remember, as we are all traveling this road to achieve vehicle fleet electrification, it's better to travel with a partner!



Introduction

Smart Energy Decisions' second annual *State of Vehicle Fleet Electrification* highlights that organizations are successfully moving through the journey to fleet electrification. Barriers remain, from access to capital and vehicles to the complexity of achieving this conversion. However, the drivers also remain strong, including the obligation to meet sustainability targets and emission reduction goals, as well as the desire to lower costs.

Despite many competing global priorities, such as inflation, the war in Ukraine, supply chain issues, and energy prices, there is still considerable momentum to grow the use of EV fleets. Federal, state, and local initiatives are playing a vital role in driving this growth. Specifically, California and New York have implemented zero-emission vehicle mandates by 2035 for cars and light trucks, while 14 states have adopted the Zero-Emission Vehicle (ZEV) program. Furthermore, while the implications of the Biden administration's recently-passed Inflation Reduction Act are parsed, the push to electrify vehicle fleets and ramp up a national charging network will continue.

With the following trends, it is evident that we have reached a tipping point in the journey to vehicle fleet electrification:

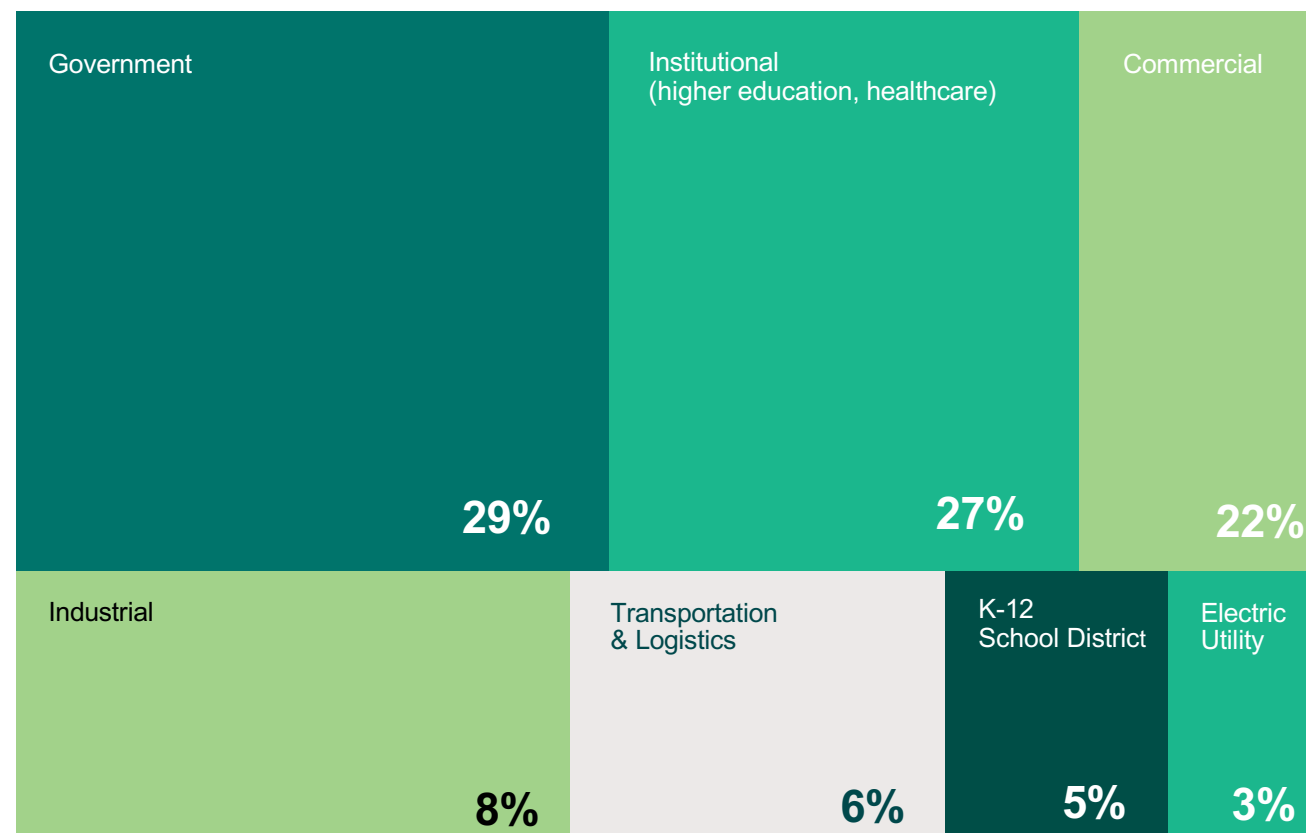
- **Pressure to decarbonization:** Pressure from external forces, including governments and the financial community, is driving corporations to strive to reach net zero by 2050. Solving the problem of GHG emissions from transportation – 27% of the total in 2020 according to the [EPA](#) – is a substantial part of achieving those goals, further motivating organizations to transition to electrified vehicle fleets.
- **Auto OEM response:** Investments by vehicle manufacturers to bring EVs to market are increasing at high speed. [Ford](#) has committed \$50 billion through 2026, ambitiously anticipating [half](#) of its global volume to be EVs by 2030. Meanwhile, [General Motors](#) announced a \$35 billion investment in EV and AV technologies through 2025.
- **Corporate customer readiness to purchase EVs:** While supply chain issues have slowed the availability of new models, the largest among these companies are quick to respond when vehicles are available. For example, [Walmart](#) purchased 4,500 all-electric delivery vehicles in July 2022, while [FedEx](#) is piloting e-transit vans. Customers with less clout seem content to place orders and wait for delivery as production runs get up to speed – but they won't wait forever.

Explore this report to understand the latest trends and benchmark your own strategies and achievements.

Methodology

Smart Energy Decisions' second annual State of Vehicle Fleet Electrification study includes results from 230 unique organizations from the SED database that responded to the electronic survey in June 2022 (see page 5 for the list). Among these respondents, 195 (85%) expressed interest in vehicle fleet electrification (VFE).

A majority of organizations were from government (29%) and higher education/healthcare Institutions (27%). This represents a shift from the profile of last year's survey, where the commercial sector was the top participant at 24%, with institutions at 22% and government at 21%. This fluctuation in VFE-interested parties can be best explained by the more rapid electrification of buses used in urban areas and college campuses, as well as the U.S. government's commitment to [50% EV sales by 2023](#).



Q. Which of the following best describes your organization?

Responding Companies

7-Eleven, Inc.
Advance Auto Parts, Inc.
Air National Guard
Alberta Urban Municipalities Association
Albertsons Companies
Allegheny County Alphabet, Inc.
Amazon.com, Inc.
Amoskeag Beverages, LLC
Andreo Family Enterprises
Anne Arundel County
Arcosa
Arizona State University
Army and Air Force Exchange Service
Atlanta Gas Light
Atlas Copco Compressors Canada
Atrium Health
Avis Budget Group
Bay Area Rapid Transit (BART)
Bed Bath & Beyond, Inc.
Bentley University
Bio-Rad Laboratories
Blue Cross Blue Shield of Florida
Bluefield State College
Bodycote
Boston University
Brown-Forman Corp.
Bucknell University
Cadillac Fairview
California Institute of Technology
Canadian Natural
Carnegie Mellon University
CBRE
Central Community College
CenturyLink
Cherry Creek School District
Chick-fil-A
CHS
Cisco

City of Alexandria, VA
City of Ames, IA
City of Asheville, NC
City of Aspen, CO
City of Aurora, CO
City of Charlotte, NC
City of Cincinnati, OH
City of Columbia, MO
City of Dublin, OH
City of Erie, PA
City of Grand Junction
City of Holdingford, MN
City of Houston
City of Kansas City, MO
City of New Britain, CT
City of Newark
City of Norfolk, VA
City of Pittsburgh
City of Richmond
City of San Mateo, CA
City of Santa Clara
City of Seattle, WA
City of South Elgin, IL
City of Wichita
City of Winston-Salem
City Utilities
Clarksburg Condominiums
Cochise County Community College
District
College of the Siskiyous
Colorado Department of Corrections
Columbia
Comcast
Commonwealth of Kentucky
Cook County Government
Cornell University
Cushman & Wakefield
Daimler Truck North America
Department of Transportation - Federal
Aviation Administration
DePauw University

Department of Veterans Affairs
Dillards, Inc.
Disney Worldwide Services
Drexel University
Duke Realty
East Bay Municipal Utility District
East Penn Manufacturing Co.
Eastern Mennonite University
Eaton
Emory University
Encompass Health
Eversource
FedEx
Fex Power Systems
Finlandia University
Florida Department of Transportation
Florida Gulf Coast University
FRB
Fulton County Government
GCCISD
General Services Administration
Georgia College & State University
Gilead Sciences
Harleton ISD
Harvard University
Haverford College
Healthsouth Corporation
Heritage Environmental
Hillsborough County Public Schools
Home Depot
Hopi Junior/Senior High School, Inc.
Humber College
Hyatt Hotels Corp.
iLEAD Education Corporation
Indiana Wesleyan University
Indianapolis Fleet Services
Integral Group
International Monetary Fund
International Paper
J.R. Simplot Company
Jacksonville University

Jones Lang LaSalle
Kualoa Ranch
Lendlease
Library of Congress
LMSD
Local Bounti
Lockheed Martin
L'Oreal
Los Angeles Cleantech Incubator
Louis Dreyfus Company
Lynxpring, Inc.
Mansfield Independent School
District Maricopa County
Marine Corps Recruit Depot, Parris Island
Martin Brower
Maryland Department of General Services
Massachusetts Water Resources Authority
Messiah University
Metro Nashville Public Schools
Metrolink
Miami-Dade County
Michigan State University
Microsoft
Mission Hills S.A. de C.V. (Colgate-Palmolive Group)
Montgomery County, MD
Monticello Independent School District
MTA
National Building Office of New Apostolic Church
NB Power
New York State Department
Newmark Knight Frank
Northbay Healthcare
NSCC
NYC Community Board 9

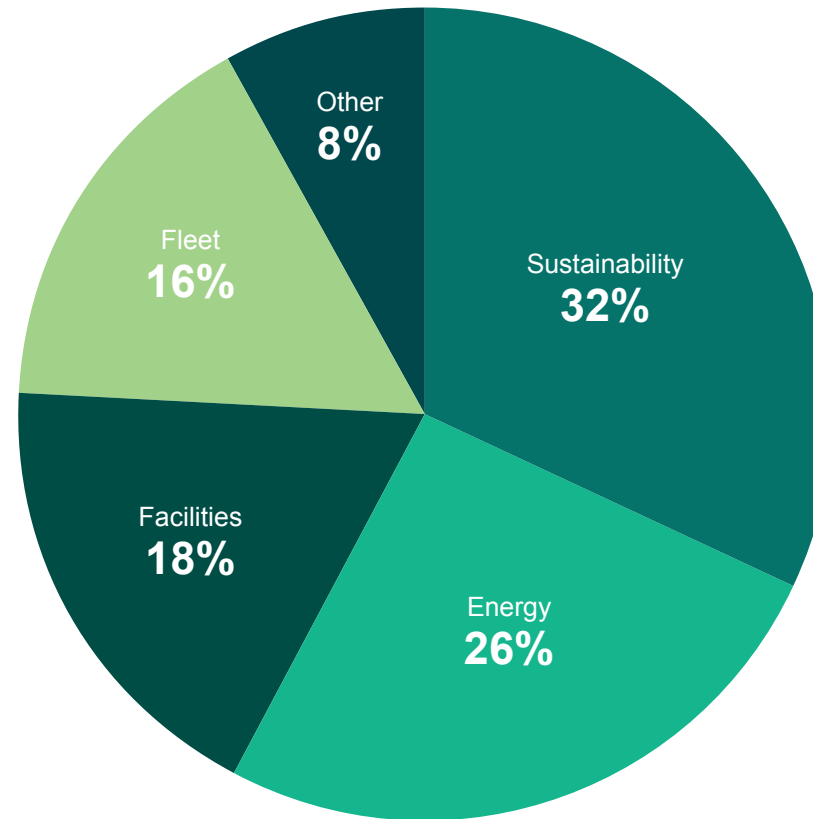
Ohio Department of Rehabilitation and Corrections
Orange Grove I.S.D.
ORIX Corp.
Oyster River Coop School District
Ozark Trucking, Inc.
Pace University
Patrick Henry Community College
Penn State University
Pet Supermarket
Philz Coffee
Pope John Paul II High School, Inc.
Port of San Diego
Port of Seattle
Progressive Insurance
ProMedica Health System
Purchase College
Renfrew County District School Board
Rhode Island College
Roberts Wesleyan College-School of Business
Salt River Project
San Jose State University
Sheetz
Sodexo S.A.
Southeastern Louisiana University
Spartanburg CSD #5
Staples
State of South Carolina
Suffolk County Community College
Sunnybrook Health Sciences Centre
SUNY Oswego
SUNY Suffolk County Community College
SYSCO
TDS, Inc.
Texas State Technical College
The Principia
The University of Texas Rio Grande Valley
T-Mobile

Town of Norwood, MA
Transwest
UW Health
U.S. Air Force Academy
U.S. Army Corps of Engineers
U.S. Department of Housing and Urban Development
U.S. National Park Service
UMass Medical School
United States Navy
University of Alabama at Birmingham
University of Arizona
University of California, San Francisco
University of Florida
University of Maryland, Baltimore County
University of Pennsylvania
University of Pittsburgh
University of Richmond
University of Texas at San Antonio
University of Washington
University of Washington, Tacoma
University of Minnesota
Utah State University
VAMedical Center - Reno
Velux Greenwood LLC
Vertex Pharmaceuticals, Inc.
Virginia Commonwealth University
Virginia Department of Energy
Wallenius Wilhelmsen Solutions
Washington University in St. Louis
Weis Markets
Wells College
Western Illinois University
Wicomico County Public Schools
Wilfrid Laurier
Wilson County Schools
Winpak
Xavier University of Louisiana
York County School Division
Zayo

Respondents by Function

Of the 195 respondents who expressed interest in VFE, the percentages of management functions were as follows: 32% sustainability, 26% energy, 18% facilities, and 16% fleet.

Each of these functions is crucial for the transition to electric vehicles – often at different phases of the journey. In many cases, sustainability and energy teams are setting goals and creating strategies that require this transition. Eventually, facilities and fleet functions will be engaged to work with energy management on implementing these plans. Specifically, they will build out the required infrastructure and clean energy plants to power the EVs with zero-emission sources and coordinate the procurement of electric vehicles.

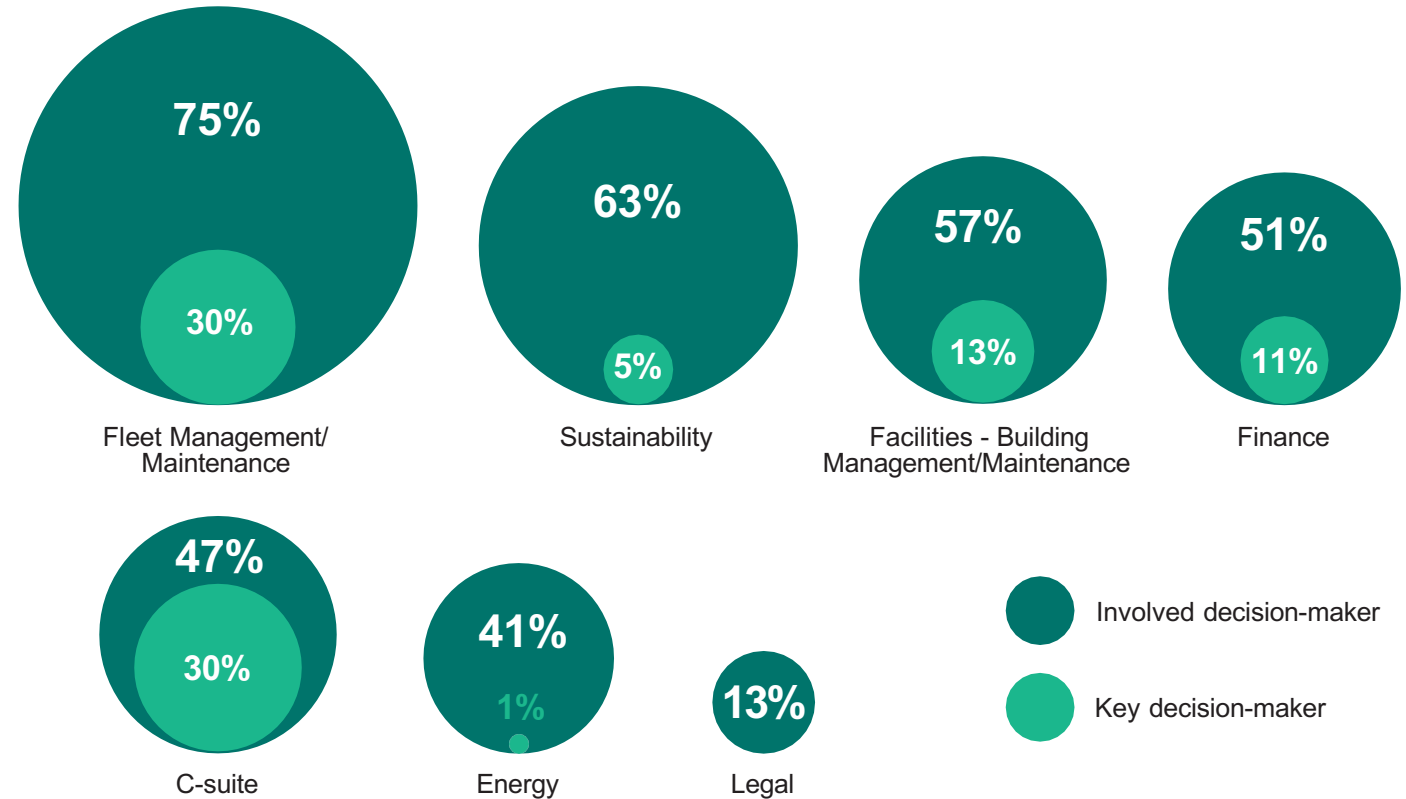


Q. Which best describes your management function?

Decision-making: Who is Driving the Process?

Fleet management/maintenance is involved in the VFE decision-making process for 75% of the respondents, with sustainability teams included 63% of the time and facilities for 57%. Senior leaders in the C-suite are only involved in the decision-making process for 47% of surveyed organizations, indicating that EVs are becoming more normalized without the need to involve upper management teams to move forward.

Fleet management and C-suite are tied at 30% for being the key decision-maker for going electric, a decrease from last year's results of 38% for fleet management and about equal to the 29% for C-suite. This result could be partly due to more government bodies being included in this year's survey, in which the government's chief decision-maker of fleet management dropped from 60% in 2022 to 39% in 2021, while C-suite rose from 20% in 2021 to 30% in 2022. Also, those with energy functions reported a noteworthy increase in decision involvement, up to 41% from 26% in 2021.



Q. Who at your organization is involved in the decision to electrify your vehicle fleet? Who is the key decision-maker?

The Evolving Road: 2022 vs. 2021

We were pleased to find that 2022 participants are farther along the journey to VFE than a year ago – an indicator that EVs are steadily moving toward mass adoption. Almost half of the surveyed organizations (48%) have established goals or are in the planning and implementation stages of VFE, compared to only 32% last year.

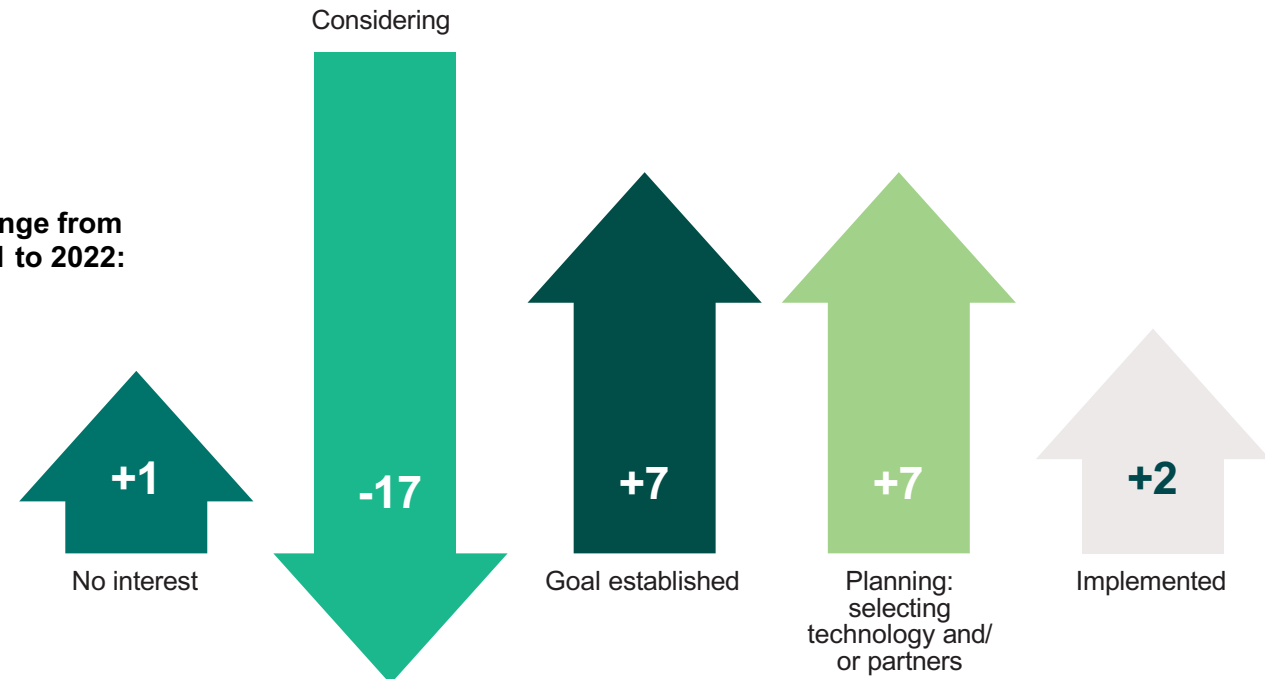
Similar to last year, government had the highest implementation rates at 23%, followed by commercial (11%), institutional (6%), and industrial (5%). The majority of those uninterested were in the industrial sector, representing 21% of the apathetic group.

With newly introduced electric trucks and SUVs debuting this year, many of the 36% considering EVs are anticipated to move to the planning phases to take advantage of these widely used and purposeful fleet vehicles. Government incentives will further accelerate the transition as the electric models become more economically feasible.

2022 Results:



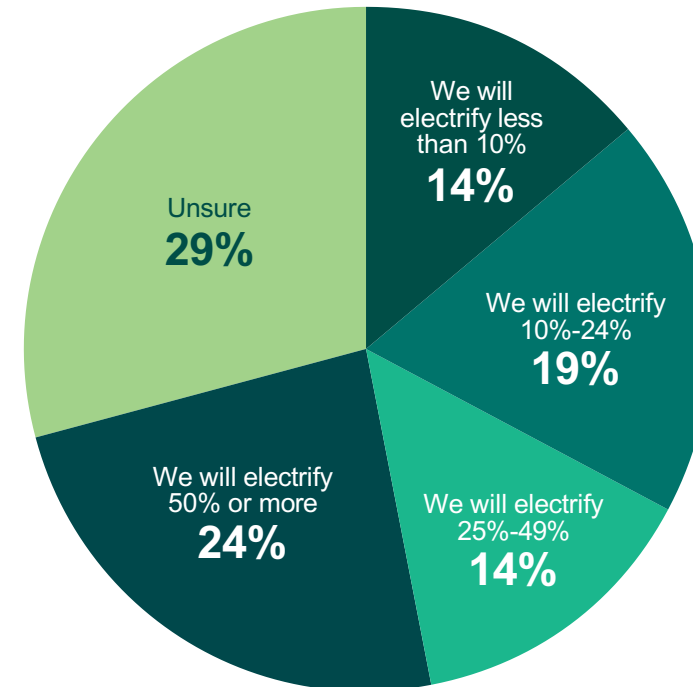
Change from 2021 to 2022:



Ambitions Intensify

Of the companies who expressed interest in VFE, 24% said they will electrify at least half of their fleet – double that of last year, which was only 12%. These ambitious targets were set equally among the government (30%), industrial (27%), and commercial (26%) sectors, with institutional only at 17%. Unsurprisingly, the groups who have already begun implementing VFE aim to electrify 50% or more of their fleet.

Over the past year, the group that was unsure about what percentage of their fleet to electrify gained some clarity, decreasing from 42% in 2021 to 29% in 2022. This shift was mainly seen within the industrial and institutional categories, which have moved forward from the considering phase to establishing goals and planning.



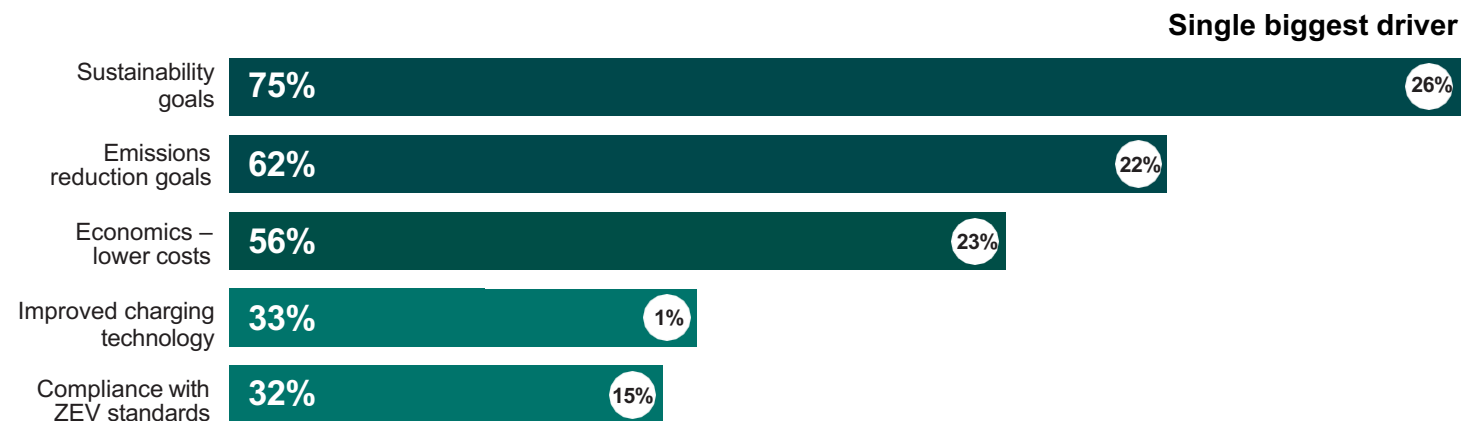
Q. Which best describes your organization's ambitions for vehicle fleet electrification in the next 5 years?

Top Drivers – Goals Lead the Way

The top three reasons for implementing EVs are the same as last year: achieving sustainability goals (75%), achieving emissions reduction goals (62%), and economics (56%). The primary driver of sustainability goals jumped 10 percentage points from 2021, further solidifying first place. Concerning the single most important motivator, 26% chose sustainability goals over the more traditional justification for investment, which is economics - at 23%.

The industrial sector cared the most about emissions reductions, with 40% listing this as their primary driver, compared to 22% of the total. Institutional respondents were most concerned about economics, representing 31% of their response, similar to the 29% of commercial respondents who indicated this driver at the top of their list.

Charging technology elevated its rank this year to 4th from 7th place, while compliance with ZEV (zero-emission vehicle) standards trailed close behind in 5th position with 15% naming this driver as most crucial for electric vehicle adoption. Government respondents rated this factor even higher, with 26% calling it the single biggest driver.



“To date, 14 states have adopted California’s ZEV program for strict emissions standards”

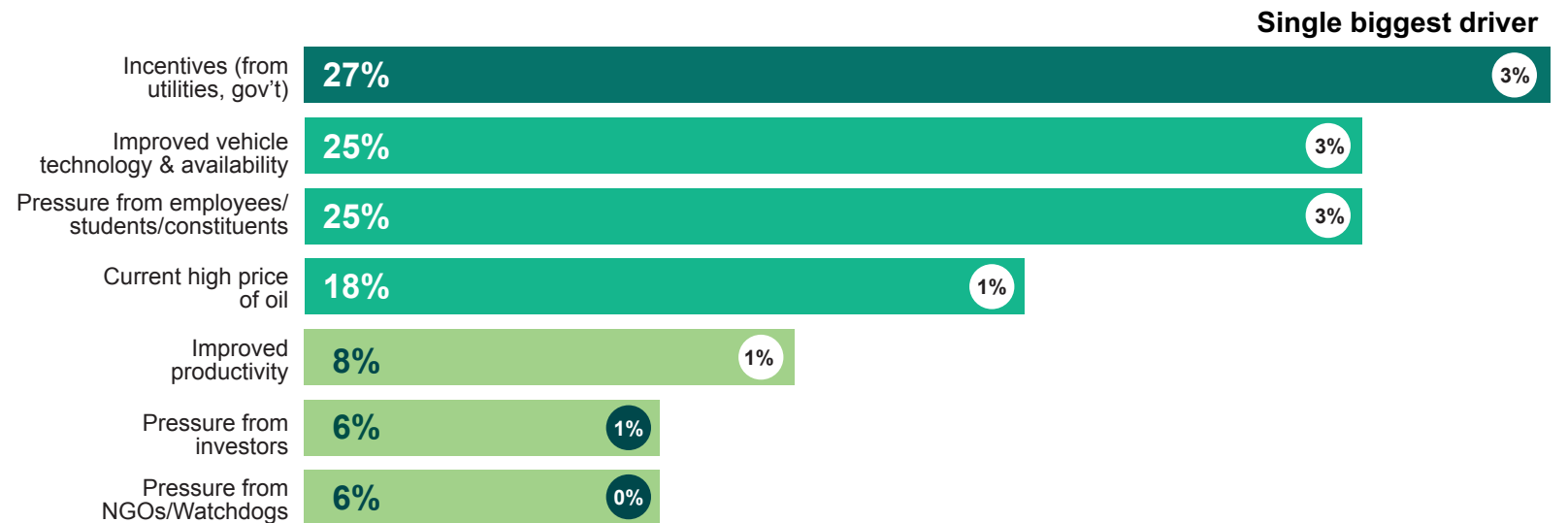
Q. What are your top reasons for implementing or considering the implementation of vehicle fleet electrification? (Select all that apply); What is your single biggest reason?

Secondary Drivers – On the Horizon

Besides the top four essential reasons for VFE adoption, no other category received more than 3% of total votes as a single top driver.

Incentives, including those from utilities and the government, were cited by 27% as a driver and only 3% as a top driver. This survey was fielded before the Inflation Reduction Act passed in August 2022; it will be interesting to see if this factor becomes a stronger influence in the months and years to come.

While gaining minimal traction as a single top driver, vehicle technology and availability as well as pressure from employees, students, and constituents were each cited as a driver by one-quarter of respondents.



Q. What are your top reasons for implementing or considering the implementation of vehicle fleet electrification? (Select all that apply); What is your single biggest reason?



The current high price of oil was cited as a driver by only 18% - but what will that figure look like next year if prices continue to rise?

Top Barriers – It Always Comes Back to Costs

Twenty-six percent of respondents specified lack of available capital as the foremost obstacle to VFE adoption. This barrier posted a 5-point increase from last year, which may be attributed to the current economic recession. The second most pertinent barrier was the limited vehicle options to meet required function at 14%, a slight dip from 18% the previous year.

Last year's most frequently cited barriers – options to meet function and range – dropped to third and fourth place, at 44% and 42%, respectively. Also tied for third place was the current fleet still being viable, a considerable challenge for implementing VFE as new petrol cars can have a relatively long lifespan.

Another set of leading barrier to VFE adoption is too many unknowns about maintenance costs, the price of electricity, infrastructure, and future vehicle development. With the rise of widespread EV adoption, this obstacle has dwindled from 36% of respondents in 2021 to 28% in 2022.



Q. What are your top reasons for implementing or considering the implementation of vehicle fleet electrification? (Select all that apply); What is your single biggest reason?



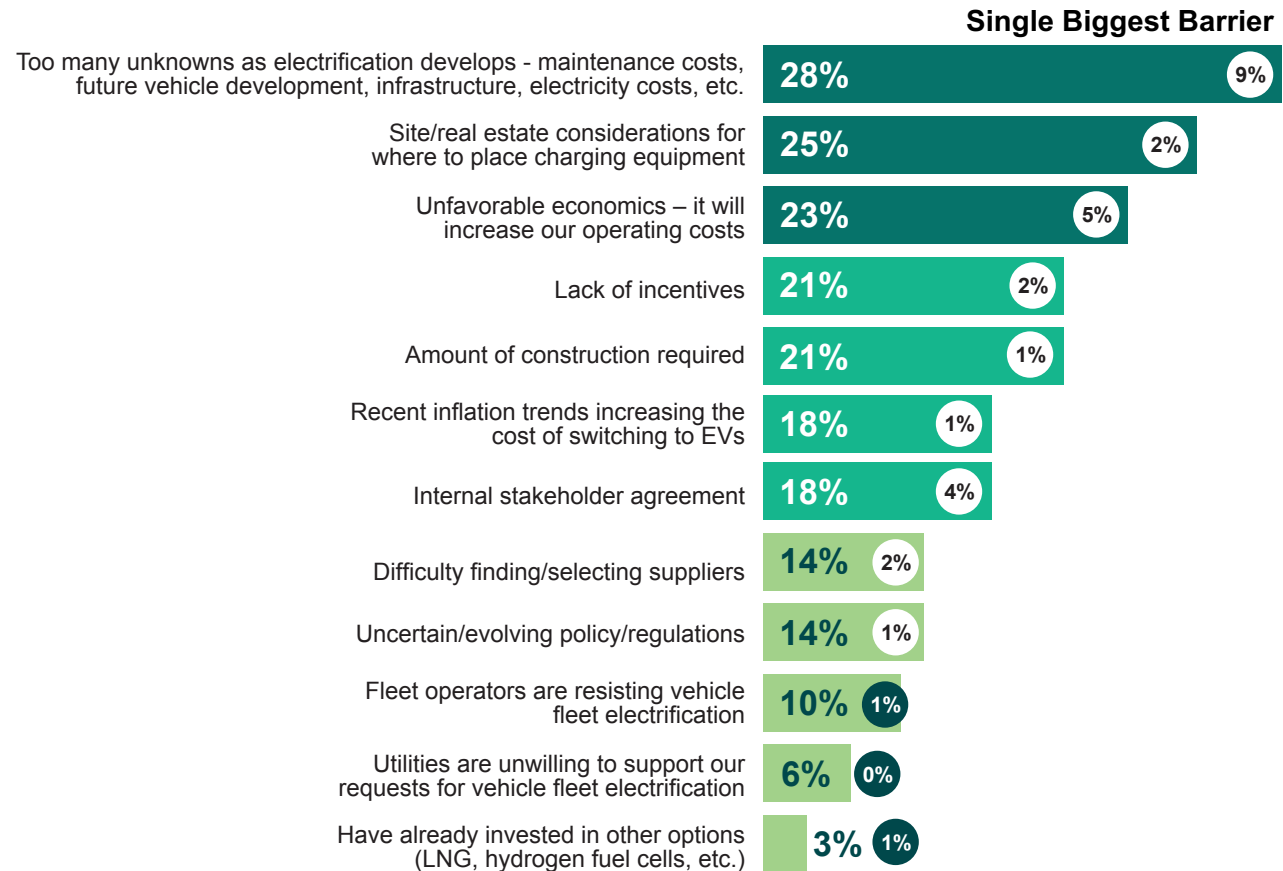
Lack of capital to invest was selected as the single biggest obstacle at more than twice the rate of any other barrier.

Secondary Barriers – Fewer Unknowns

Among secondary barriers, too many unknowns about maintenance costs, the price of electricity, infrastructure, and future vehicle development is starting to decrease; with the rise in adoption of EVs, this obstacle fell from 36% of respondents in 2021 to 28% in 2022.

Most of these secondary barriers were reported at similar levels to last year, except for lack of incentives, which decreased from 26% to 21%. Inflation adding to the cost of switching to EVs, which was added for the first time this year, was cited by 18%.

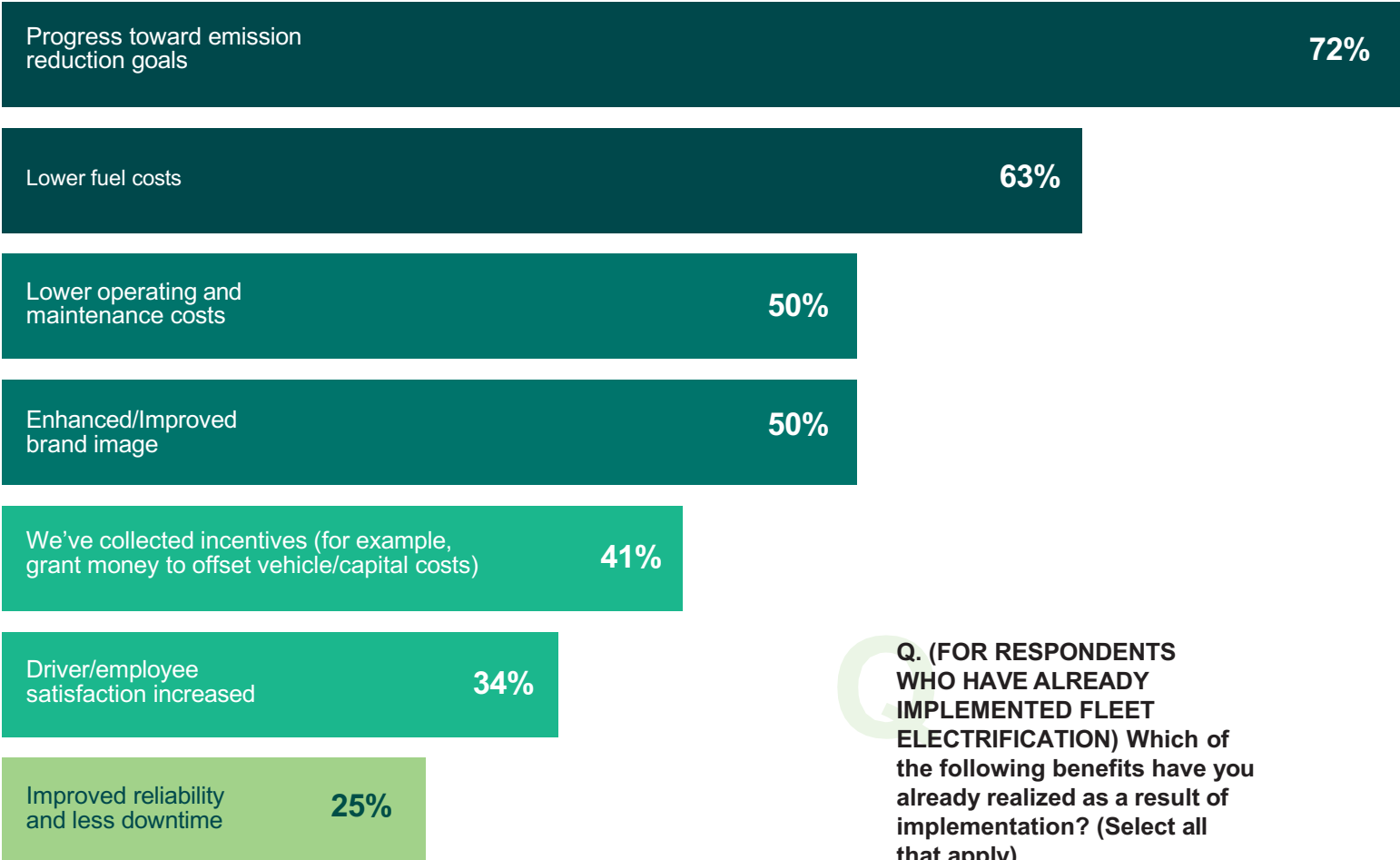
When asked to select their number one anticipated obstacle, the majority of this group of barriers were chosen by fewer than 10%. One interesting shift from last year: Unfavorable economics dropped from 10% to only 5% as a top barrier as operators realize the long-term economic benefits of EVs.



Benefits Realized

Of those who have electrified at least part of their fleet, positive results are reassuring that this is a journey worth taking. Almost three-quarters (72%) have already benefited from progress toward their emissions reduction goals – the dominant driver in 2022.

Another 63% experienced lowered fuel costs (a lower barrier this year but one that is expected to grow with rising gas prices), and half of those who implemented VFE also reduced operating and maintenance costs. Improved reliability and downtime were noted as benefits by 25%, contributing to lower O&M costs. Fifty percent also reported enhanced brand image as a win to aid in marketing campaigns as sustainability gains mainstream popularity.



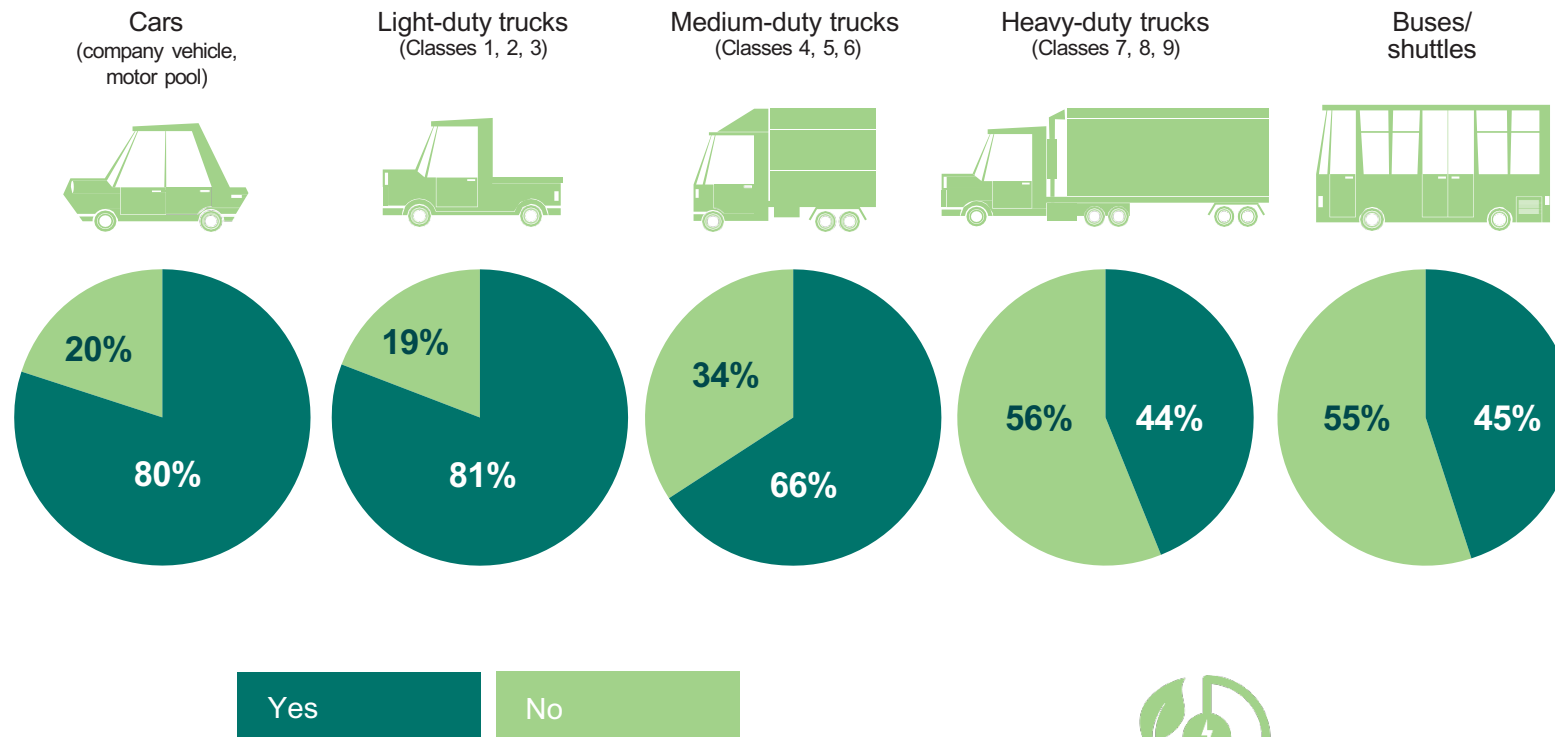
Q. (FOR RESPONDENTS WHO HAVE ALREADY IMPLEMENTED FLEET ELECTRIFICATION) Which of the following benefits have you already realized as a result of implementation? (Select all that apply)

Today's Fleet

Beyond electric cars, the business case for heavier EV models is evident. Many auto manufacturers are adopting these models, having debuted their electric pickup truck lines earlier this year.

Overall, VFE-interested organizations' current use of light-duty trucks and cars is virtually tied at 81% and 80%, respectively. Institutions and governments are more likely to have these two types of vehicles in their fleets (about 90%) than commercial and industrial locations (averaging 68%).

Medium-duty trucks are included in 66% of fleets (predominately government and institutions). The use of heavy-duty trucks declined from 50% to 44% as institutions drastically reduced their utilization in the current study compared to a year ago. Buses and shuttles were included in 45% of VFE-interested respondents' fleets; as expected, usage of buses is highest among institutions and governments.



Q. What types of vehicles are currently in your fleet? (Select all that apply)

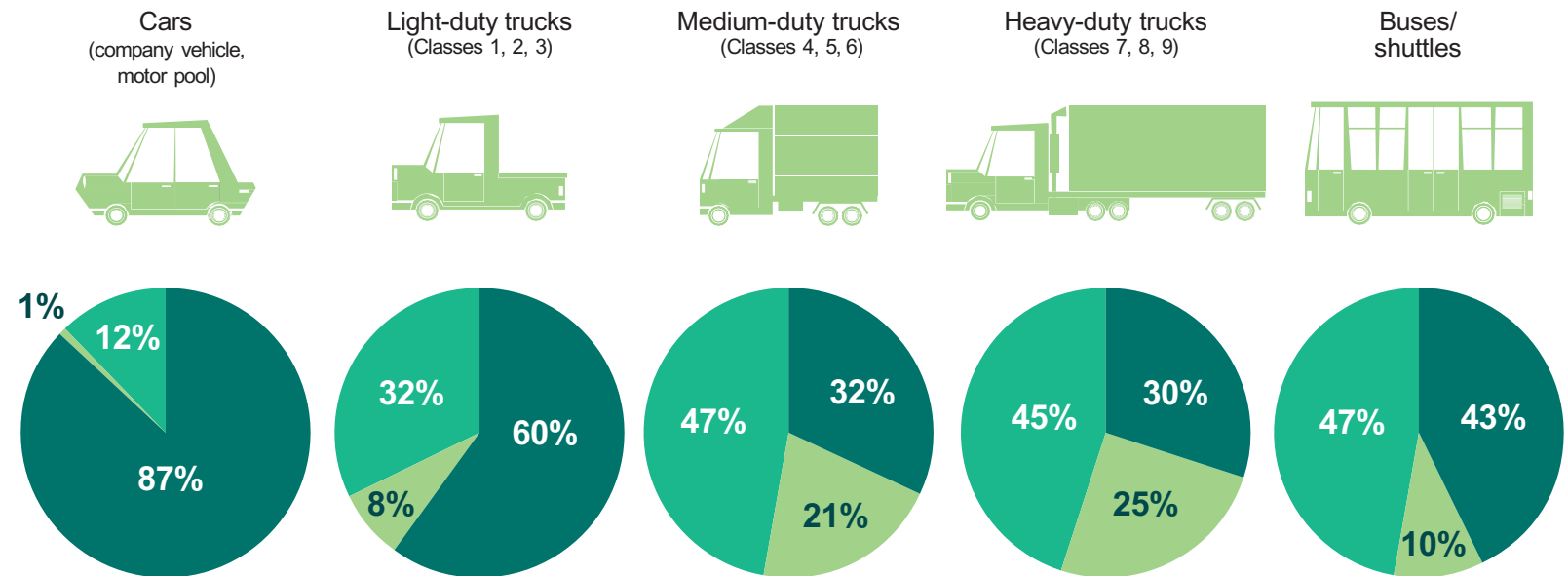


No surprise – the use of buses and shuttles is higher among government (63%) and institutions (59%) compared to the total of 45%.

Tomorrow's Fleet

When respondents were asked which vehicles they intend to electrify in the next five years, 87% chose cars as their primary focus –climbing an additional 20% from last year. As expected, uncertainty increased with the heavier-duty models, with 47% indicating they were unsure about electrifying medium and heavy-duty trucks and buses, compared to only 12% unsure about transitioning their company cars.

The percentage of those desiring to electrify their trucks jumped by about 10% in each truck's class (light, medium, and heavy-duty) from 2021 to 2022, revealing market readiness has arrived. Car companies must rapidly scale their manufacturing capacities for these high-demand utility electric vehicles so adequate supply is available.



Q. For each type of vehicle in your fleet, indicate if you intend to electrify that type in the next five years.

Yes

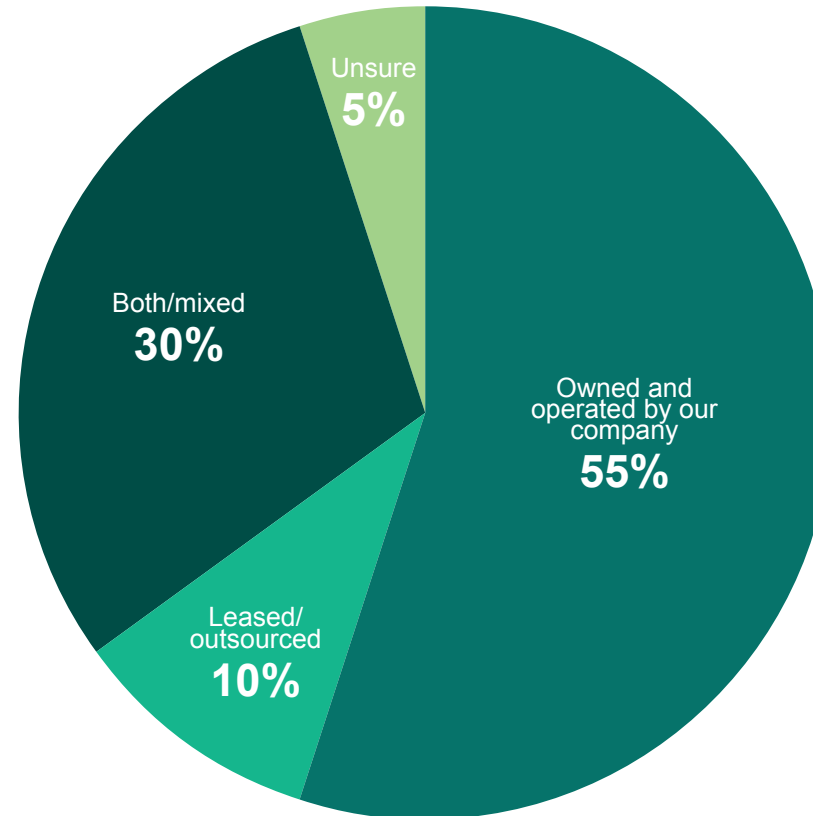
No

Unsure

Fleet Ownership: Preferred Models

Fleet ownership models stayed fairly consistent from last year, with 55% owning their fleet, 10% leasing or outsourcing, and 30% a mix of both. Those who own their fleets tend to be farther ahead in the journey to electrify their fleets, as their equity can benefit from a host of advantages offered by EVs, such as lower operation and maintenance costs.

Almost three-quarters of those surveyed who have already implemented VFE own their fleets. Some segments saw fleet ownership decrease from last year, with government responses down from 85% to 67% indicating a preference for a mixed ownership model. Commercial operators posted a decline from 43% to 29%, trending toward a hands-off leased model.



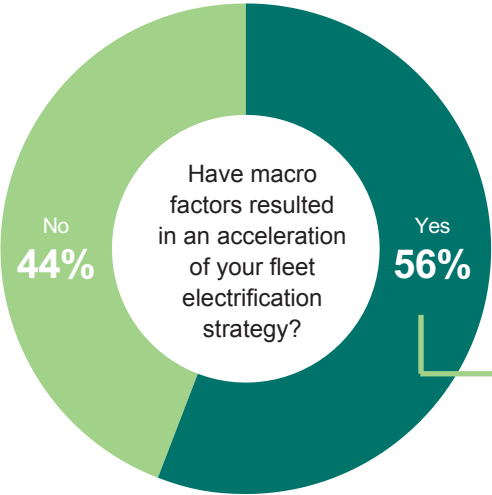
Q. Is your organization's fleet currently: owned and operated by our company; leased/outsourced; both/mixed; unsure.

Macro Factors

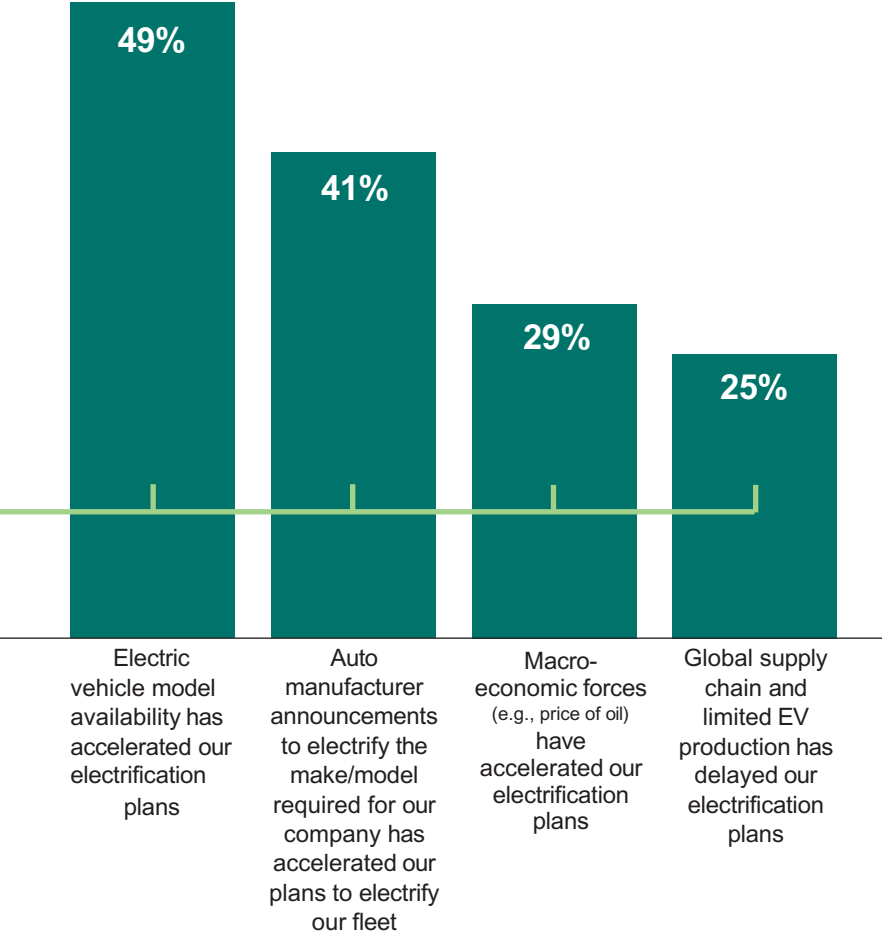
Over half (56%) of the organizations interested in vehicle fleet electrification indicated that macro factors accelerated their strategies within the past year. Twenty-eight percent cited EV model availability as a primary reason for rapidly moving forward; for those in the goal planning or implementation stages, that figure rose to one-third.

Auto manufacturer announcements quickened the pace of electrification plans for 23% of respondents to place pre-orders on high-demand models such as EV light-duty trucks.

The higher price of oil has created a sense of urgency for some respondents to switch to EVs (16%), while simultaneously, supply chain shortages have delayed others' VFE plans (14%) by limiting EV production. Despite inflation being a barrier for 18% of respondents, this macroeconomic force was not listed as causing a delay in any electrification plans for those interested in VFE.



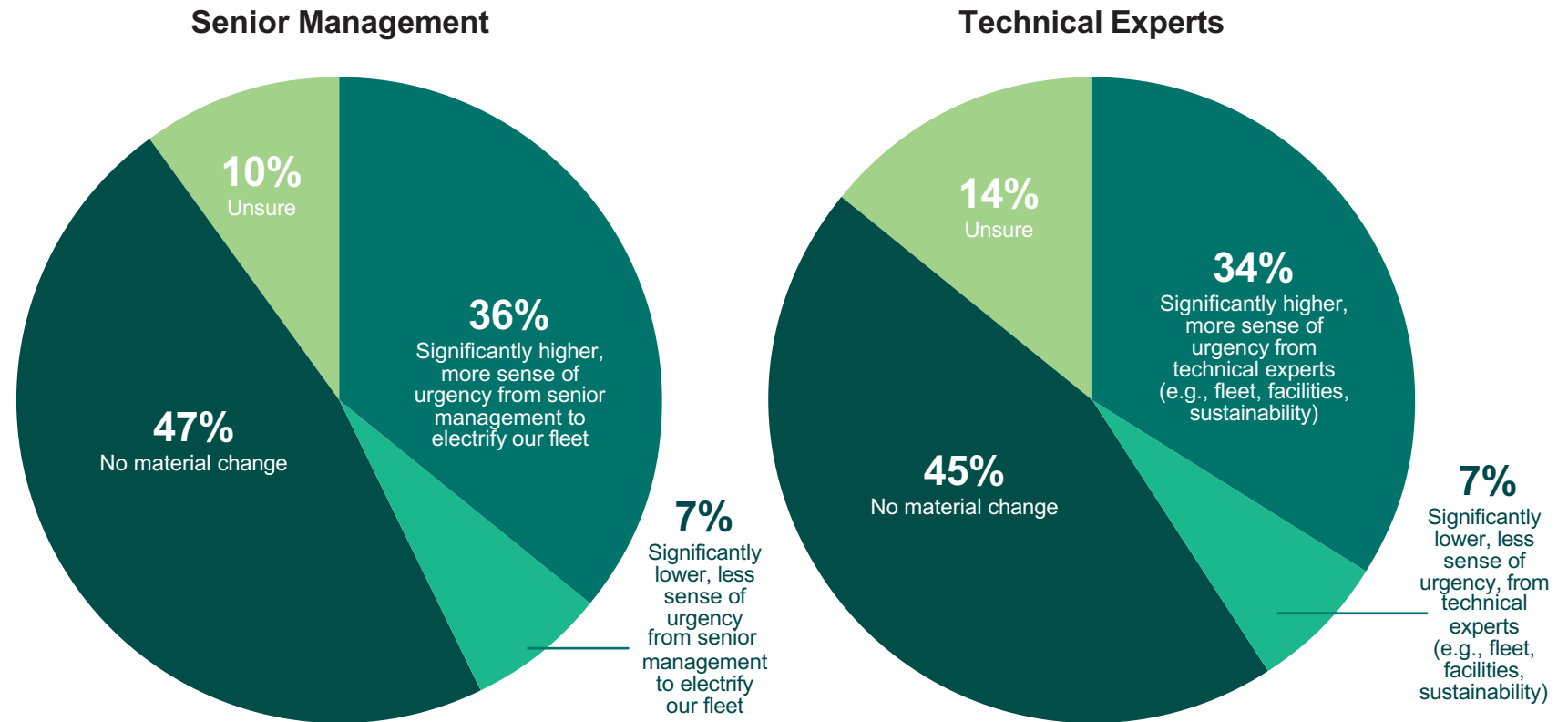
Q. Which of the following macro factors has resulted in an acceleration of your fleet electrification strategy in the past year? (Select all that apply)



Sentiment Towards VFE – On the Same Page

Almost half (47%) of those interested in VFE reported no material change in internal sentiment by their company's senior management toward fleet electrification. Over one-third (36%) saw an increased sense of urgency from their upper management, mostly within the government (47%) and commercial (40%) sectors.

When asked the same question regarding their organization's technical experts, the answers were almost the same, with 45% indicating no change in sentiment from the previous year and 34% with increased urgency. The consensus between senior management and technical experts suggests that both teams are working together toward the same goal of fleet electrification.



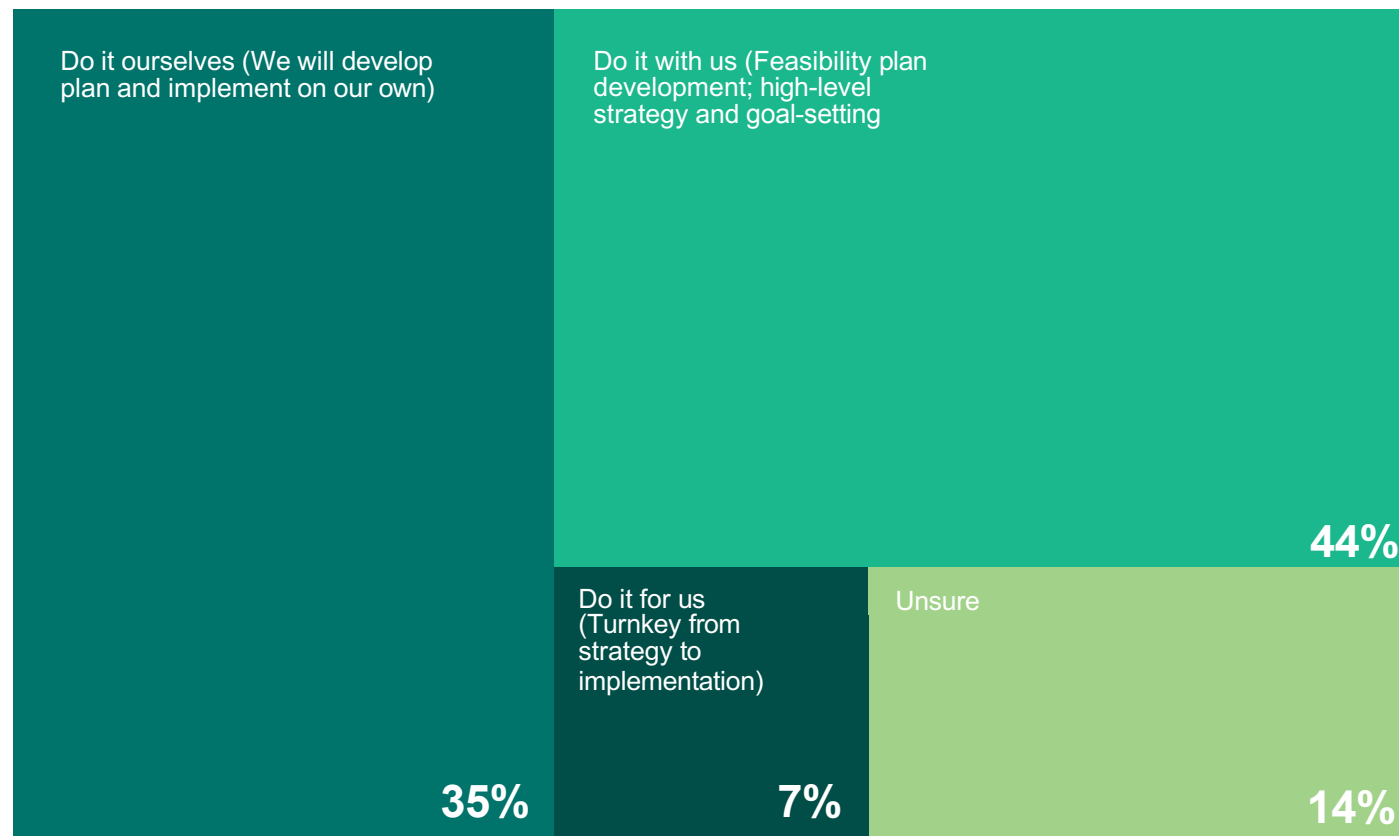
Q. Which of the following statements best describes the change in the internal sentiment by your company's senior management/technical experts toward fleet electrification in the past year?

Levels of Support

Since 2021, companies' VEF strategies have stayed the course with virtually no change in levels of requested support. Most organizations are seeking some handholding, with 44% seeking a collaboration and 7% (mostly government) looking for a turnkey approach. Over one-third (35%) would like to develop and implement their electrification plan without assistance.

Of those desiring a strategic partnership, there was an increase among energy job functions (29% to 47%) and those currently considering VFE (43% to 53%). Fleet management was more confident to do it themselves, as their need for a third party decreased from 49% to 41%, and those in the implementation phase dropped from 39% to 27%.

Organizations that have implemented their VFE strategies (61%) are also more likely to want to do it themselves. However, those at the beginning stages that are considering options favor having a strong collaborator (53%).



Q. What type of support do you require to implement vehicle fleet electrification?



Conclusions

The need for vehicle fleet electrification (VFE) continues to grow – and technology and resources to overcome barriers are rising to the challenge. Among the key trends seen in the current *State of Vehicle Fleet Electrification*:

- Organizations are more motivated than ever to make the transition to VFE, thanks to ever-increasing and more public sustainability goals, particularly the pressure to decarbonize and achieve net-zero goals.
- Solutions to the biggest barriers are becoming increasingly available as more vehicle options are brought to market and the availability of charging networks increases.
- While implications of the Inflation Reduction Act are still being parsed, the possibility of additional funding and incentives is likely to accelerate plans to electrify fleets.
- As organizations recognize the importance of fleet electrification, they are also gaining an appreciation for the complexity of the task at hand, which involves investments in vehicles and infrastructure and procuring the necessary energy supply. Bringing together internal stakeholders to develop and implement strategies early in the process is key to the success of any program.
- Organizations gain confidence as they advance through the phases of planning and implementing fleet electrification. However, those getting started need guidance from strong partners to help them with this journey.

Acknowledgments



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