

*Issued:  
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## **Technology & Maintenance Council**



*Turning Experience Into Practice*

### **Greenhouse Gas (GHG) Phase 3 Member Survey (2023)**

Developed by the Technology & Maintenance Council (TMC)

#### **ABSTRACT**

Sixty-five individual TMC Fleet Executive level members responded to TMC's "Greenhouse Gas (GHG) Phase 3 Member Survey," which was administered in May and June 2023. The purpose of the study was to gather intelligence required for American Trucking Associations, Inc. (ATA) to offer a comprehensive response to the U.S. Environmental Protection Agency's (EPA) GHG Phase 3 proposal. The survey consisted of 25 questions, covering fleet demographics, experience with battery electric and hydrogen fuel cell vehicles, as well as any future plans the responding fleets may have regarding these technologies and the infrastructure that supports them. The majority of those responding indicated little or no experience with either BEVs or hydrogen fuel cell vehicles. Of those that did report experience, a majority reported being either greatly dissatisfied or dissatisfied with respect to range, charging times and cost.

While most respondents did not have current experience with BEVs or hydrogen fuel cell vehicles, 50 percent reported they expect to have to include them in their fleets, mainly to comply with anticipated future regulations. Respondents are generally negative regarding the anticipated payback period for the new technologies as compared to their existing fleet inventory, and many expressed concern over long lead times for charging station installations and infrastructure challenges. In order to compensate for these perceived challenges, many reported needing weight exemptions, financial and tax incentives and extended rollout timetables for regulatory compliance if BEVs and hydrogen fuel cell vehicles are to be successfully integrated into their fleet operations. □



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## INTRODUCTION

Sixty-five individual TMC Fleet Executive level members responded to TMC’s “Greenhouse Gas (GHG) Phase 3 Member Survey,” which was administered in May and June 2023. The purpose of the study was to gather intelligence required for American Trucking Associations, Inc. (ATA) to offer a comprehensive response to the U.S Environmental Protection Agency’s (EPA) GHG Phase 3 proposal. The survey consisted of 25 questions, covering fleet demographics, experience with battery electric and hydrogen fuel cell vehicles, as well as any future plans the responding fleets may have regarding these technologies and supporting infrastructure.

## METHODOLOGY

Survey alerts were sent via email to more than 500 TMC Fleet Executive Level Members at

various times starting in May 2023 and closing in June 2023. **Figure 1** illustrates how the survey notice email appeared to recipients.

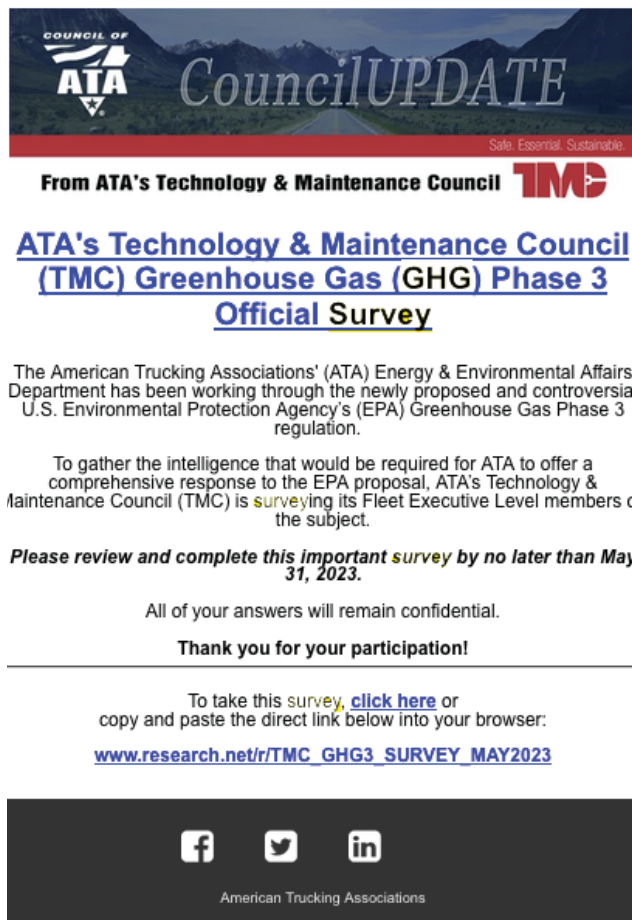
The survey was conducted using SurveyMonkey. Eblast alerts were generated using the Adestra email management system. Sixty-five individuals attempted to complete at least a portion of the survey. The survey was activated on May 18, 2023. The survey was closed June 1, 2023.

The survey was initiated at the request of the American Trucking Associations’ Energy & Environmental Affairs Department, and administered by Council staff members Robert Braswell, TMC Executive Director, and Cori Hicks, TMC Administrative Coordinator.

## RESULTS

The total number of responding TMC member fleets was 65. The response rate was about 13 percent. Survey respondents were asked a series of demographic questions to determine their company’s geographic area of operation, vocation and fleet size (if applicable).

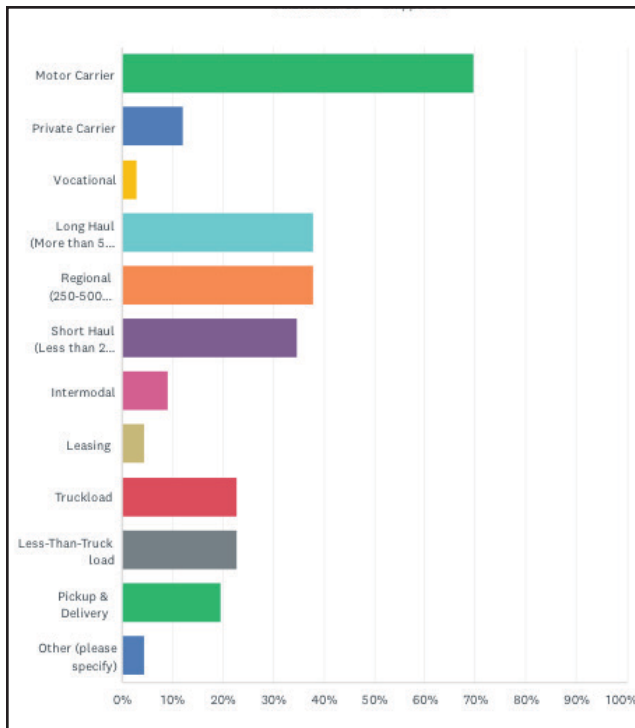
*Q1: Which of the following best describes your company’s operation (check all that apply)?*



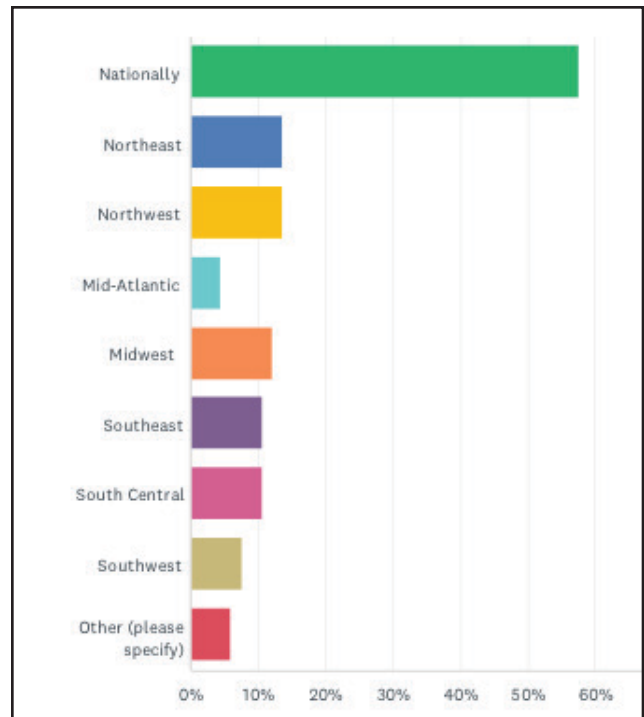
Vocation	Number
Motor Carrier	46
Private carrier	8
Vocational	2
Longhaul	25
Regional	25
Shorthaul	23
Intermodal	6
Leasing (full service)	3
Truckload	15
Less-than-Truckload	15
Pickup & Delivery	13
Other (household movers)	3

See **Figure 2**.

**Figure 1**



**Figure 2: Vocation**



**Figure 3: Region**

*Q2: In what area(s) does your fleet principally operate (check all that apply)?*

Region	Number
Nationally	38
Northeast	9
Northwest	9
Mid-Atlantic	3
Midwest	8
Southeast	7
South Central	7
Southwest (including Hawaii)	5
Other (includes Alaska, Canada)	4

See **Figure 3**.

*Q3: How many diesel-powered pieces of equipment does your fleet operate?*

Individuals reported operating the following types of equipment in their operations. Sixty of 65 reported using Class 7 & 8 equipment.

Class 7 & 8 Tractors/Trucks	60
Class 5 & 6 Trucks	34
Class 3 & 4 Trucks	35

The total number of Class 7/8 tractors and trucks reported was 38,452. The total number of Class 5/6 trucks reported was 11,827. The total number of Class 3/4 trucks reported was 11,398.

*Q4: How many battery electric vehicles (BEVs) have you purchased or leased for your fleet?*

About 76.7 percent of respondents said their fleet has never purchased or leased battery electric vehicles (BEVs). Only 3.28 percent had reported purchasing or leasing 1-9 units. No one reported purchasing or leasing more than 99 BEVs.

The distribution of responses follows below:

Answer	Number
None	46
1-9	8
10-49	2
50-99	2
100-249	1
250-999	1
1000 or more	0

**Q5: How many hydrogen fuel cell vehicles have you purchased or leased for your fleet?**

About 93.4 percent of respondents said their fleet has never purchased or leased hydrogen fuel cell vehicles. Only 3.28 percent had reported purchasing or leasing 1-9 units. No one reported purchasing or leasing more than 99 such vehicles. The distribution of responses follows below:

Answer	Number
None	57
1-9	2
10-49	1
50-99	1
100-249	0
250-999	0
1000 or more	0

**Q6: If you answered "None" above, are you exploring integrating electric vehicles into your existing operations?**

Of those who reported purchase or lease of no BEVs, the majority (55 percent) said they were not exploring integrating electric vehicles into existing operations. The remaining 45 percent answered "yes."

**Q7: Please rank your experience with the new technology? Examples: Range, serviceability, durability, charging times.**

Respondents were asked to rate range, serviceability, charging times, maintainability, durability and cost associated with BEVs. Those who said they had experience with this new technology said the following:

Range	Percent
Greatly Dissatisfied	47.5%
Dissatisfied	17.5%
Neutral	27.5%
Satisfied	7.5%
Greatly Satisfied	0%

Serviceability	Percent
Greatly Dissatisfied	17.9%
Dissatisfied	30.8%
Neutral	43.6%
Satisfied	7.7%
Greatly Satisfied	0%

Charging Times	Percent
Greatly Dissatisfied	40.0%
Dissatisfied	17.5%
Neutral	32.5%
Satisfied	10.0%
Greatly Satisfied	0%

Maintainability	Percent
Greatly Dissatisfied	12.8%
Dissatisfied	23.1%
Neutral	56.4%
Satisfied	5.1%
Greatly Satisfied	2.6%

Durability	Percent
Greatly Dissatisfied	23.1%
Dissatisfied	20.5%
Neutral	46.1%
Satisfied	7.7%
Greatly Satisfied	2.6%

Cost	Percent
Greatly Dissatisfied	60.0%
Dissatisfied	22.5%
Neutral	17.5%
Satisfied	0%
Greatly Satisfied	0%

**Q8: What is your payback period for your current conventionally powered fleet?**

Respondents reported the following regarding payback periods for their conventionally powered fleets:

Answer	Percent
Less than one year	8.33%
1-3 Years	33.3%
3-5 Years	39.6%
5-7 Years	12.5%
More than 7 Years	6.25%

**Q9: What do you expect as the payback period for any electric or hydrogen fuel cell vehicle?**

Respondents reported the following as their expected payback periods for any electric or hydrogen fuel cell vehicles:

Answer	Percent
Less than one year	8.33%
1-3 Years	33.3%
3-5 Years	39.6%
5-7 Years	12.5%
More than 7 Years	6.25%

**Q10: Have you experienced any difficulty insuring battery electric or hydrogen fuel cell vehicles?**

The majority of respondents (74.2 percent) said they did not experience any difficulty insuring BEV or hydrogen fuel cell vehicles. The remaining 25.8 percent answered “yes.”

**Q11: What do you expect the residual value of these vehicles to be? (Please specify in US Dollars)**

There was no single, common response to this question. Responses ranged from specific dollar figures ranging from \$0 to \$150,000. Others responded they did not know what the residual value might be, while others responded they expected there to be a negative residual value. Some representative comments included:

- *Negative Value. Batteries are not expected to last beyond 5 years without significant reduction in range. Battery replacement every 5-7 years alone will be more expensive than purchasing a conventionally powered truck.*
- *The early EVs will lose a lot of value because the technology is changing so fast that they will soon be obsolete.*
- *No clue, I don't think anyone knows or cares that small and midsize carriers do not have the time or money to deal with the pace this is coming at us!*

- *Unknown. Early vehicles mean technology that is outdated a year later.*

**Q12: Have you had to retrain your maintenance technicians to service battery electric or hydrogen fuel cell vehicles?**

The majority of respondents (76.3 percent) answered “no,” and the remaining 23.7 percent answered “yes.” This is consistent with earlier responses that indicated most fleets said they had little or no experience with these types of vehicles.

**Q13: If the answer above was "yes," what is the required skill set and timeline to ensure technicians are knowledgeable to work on these electric and/or hydrogen fuel cell trucks?**

Twelve individuals responded to this question. The following responses are representative of those received:

- *TBD—most of these new vehicles are too new for even the OE service techs to be familiar with, so our techs are just trained enough to know how to be safe around them and how to perform basic maintenance tasks (tires, brakes, etc).*
- *We do not have any "yet" we are just confused what to do and when?*
- *Training on new battery electric vehicles. Training occurs within a few months of deploying BEVs.*
- *Forced outsourcing at premium prices. With this, there is a void of qualified personnel. In addition to current skills, technicians will now have to be trained in high voltage electricity.*
- *We are trying to be allowed to work on the high voltage side of the units but have not been allowed to. We have taken all online training available and are willing to purchase tooling and commit to this. We do everything on our diesel and CNG trucks.*
- *None currently in the fleet but absolutely will need to retrain/ further train as these vehicles enter the fleet.*

*Q14: Does your operation plan to install charging on site or anticipate utilizing public charging when it becomes available for commercial vehicles? Please explain.*

Thirty-six individuals responded to this question, of whom 19 said they planned to install charging onsite or anticipated using public charging when available. Several others said their decision would depend on cost, routes and site availability. Eleven said definitively they would not.

*Q15: What experience have you had with your utility to integrate charging on site?*

Twenty-three of 33 respondents reported little or no experience in this area. The remaining fleets reported frustration with long lead times for installation and availability. The following responses are representative of those received:

- *We attempted to install battery electric fork lifts at one of our facilities a decade ago and the cost to get the power to the building and redo the electric infrastructure was cost prohibitive.*
- *So far, it has been difficult for even small to medium size projects, and very expensive. Working-level utility folks are great to deal with, but the regulations they are bound by make the job very difficult.*
- *Not much. However, we did receive a rebate to integrate two level 2 chargers for light duty electric vehicles that we have already incorporated.*
- *Slow for the utility to respond.*
- *At this point, utility can't even install adequate power to larger new buildings. Some construction projects on three-year wait to connect. Expanding to include major commercial transportation may take 10 years.*
- *18-24 month lead time. 12 markets we are looking at electrifying with 10 different utilities.*
- *Only one California location today. Once installed the site was maxed out on supply.*

*Q16: If you do not have onsite charging, have you begun having conversations with your utility?*

Forty individuals responded to this question. Of these, 32.5 percent reported “no,” and 67.5 percent reported “yes.”

*Q17: What is the lead time being quoted for onsite charging installation? (Please select the best range that applies.)*

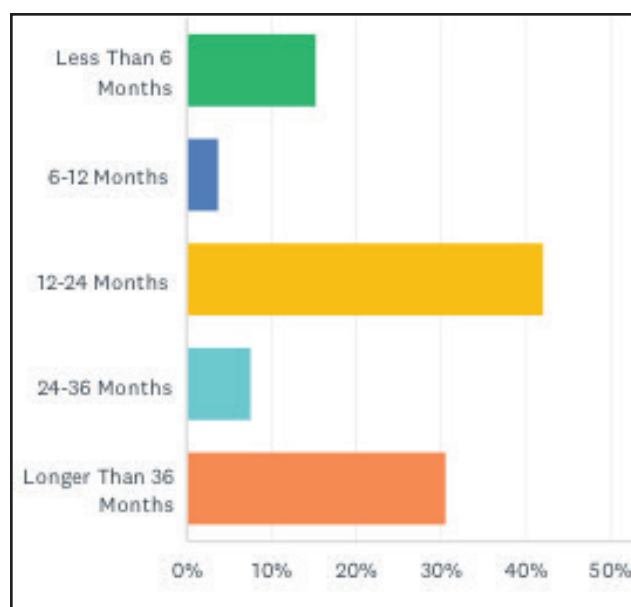
Twenty-six individuals responded to this question. The distribution of answers follows:

Answer	Percent
Less than six months	15.4%
6-12 months	3.8%
12-24 months	42.3%
24-36 months	7.7%
Longer than 36 months	30.8%

See **Figure 4**.

*Q18: Is your company investing capital to own charging on site?*

Thirty-five individuals responded to this question. Of these, 62.7 percent reported “no,” and 37.1 percent reported “yes.”



**Figure 4: Station Installation Lead Time**

*Q19: How would you rate the promise of electric vehicle and hydrogen fuel cell technology on a scale of 1-10? (10 being the best and 1 being the worst.)*

Thirty-eight individuals responded to this question. The average rating received was 3.54 out of 10.

*Q20: Why did you rate the Promise of EV and Hydrogen Fuel Cell technology as you did in the question above? Please explain.*

Thirty-five individuals responded to this question. The following responses are representative of those received:

- *Weight and distance concerns*
- *Will have limited use*
- *No proven technology in harsh climates. Hydrogen is very inefficient and costly.*
- *I think electric it not feasible for our operation at all. Hydrogen has some promise from a length of haul and time on the street, but is still less efficient than diesel and takes more energy to make hydrogen than it produces.*
- *The ROI, political impacts of the necessary rare earth minerals, and environmental impacts of battery proliferation are far worse than current clean diesel alternatives.*
- *Huge unknown with technology and infrastructure to support.*
- *Because it only changes the problem. It doesn't solve it*
- *Reliability for both is below our economic threshold. Availability is questionable for trucks and grid capacity.*
- *I am not opposed to hydrogen-powered equipment. There is not enough power to the existing grid to support current technology, not sure how we can buy equipment that can not meet the needs of our contracts.*
- *Too many initial challenges upfront with know known solutions to overcome complete cost and range issues.*
- *Because seeing is believing. Also I feel the government has an agenda here which may not necessarily be in our best interest.*
- *The promise is excellent. These vehicles can be envisioned as total replacements for our existing fleets, but the reality is that a lot of assumptions will have to come true to make that happen.*
- *No long testing results available.*
- *Too early to give any value to EV or HFC before using it*
- *It is coming at us too fast! We have no clue what to do first or even if we should do anything at all? What about our current fleet? What happens to that equipment? We cant get trucks now, and they think there will be enough EV or Hydrogen trucks available?*
- *This question should have been separate for each technology. Battery electric is in production with many OEM's but still has limitations for range, cost and weight. Hydrogen fuel cell is still in development.*
- *First hand experience as well as limited infrastructure. These technologies are in their infancy and do not appear ready for large scale deployment. Using battery versus LP gas forklifts as a reference for life cycle cost savings since it is an established technology, it appears projected cost savings from the government for battery powered trucks are very optimistic..*
- *After attending the ACT expo a few weeks ago and doing further research, there are still more questions than answers. The charging infrastructure is nowhere near where it needs to be. The grid can not handle the necessary power needed to put infrastructure in. The trucks are cost prohibitive from an initial investment standpoint. I am having a difficult time getting an actual quote or an order for a Class 6 BEV box truck. The dealers do not have people knowledgeable with selling those trucks in my market.*

- *There are too many holes or discrepancies in the plans we hear. No one is talking about the lack of power to charge these trucks. The lack of range has improved but I don't hear much progress. Everyone is ignoring the fact that EV's have a much larger carbon foot print than current diesel trucks.*
- *I think the move to HFC is the future for long haul and there is not enough R and D for that type of fuel.*
- *Our electricity grid will not be able to handle the demand of EV vehicles. They are too expensive and we don't think we can afford to insure them. Batteries for them are too expensive.*
- *Long term we feel that alternate power technology will be able to be utilized in specific parts of the industry successfully, but likely will not be able to provide a solution for all use cases.*
- *I'm optimistic due to how fast technology is evolving. Concerned over the utilities on the electric side and cost structure of hydrogen. It will only make sense if it comes down significantly in cost (infrastructure will take at least a decade) or diesel will have to climb in cost to catch up to it.*

**Q21: Are you expecting to expand your electric vehicle or hydrogen fuel cell portfolio in the next 3 years?**

Forty individuals responded to this question. Of these, 50 percent reported “no,” and 50 percent reported “yes.”

**Q22: Are electric or fuel cell vehicles part of your company's sustainability goals?**

Thirty-seven individuals responded to this question. Of these, 59.5 percent reported “no,” and 40.5 percent reported “yes.”

**Q23: If you answered "yes" in the previous question, please describe the anticipated extent and timing of deployment.**

Fourteen individuals responded to this question. The following responses are representative of those received:

- *Will have to follow the mandate.*
- *Looking at yard trucks first and on site charging stations. Port trucks etc. In the next 3-5 years.*
- *Depends on our utility provider, they are waiting until we have electric trucks to start building and we are waiting until they have the electricity available to purchase trucks.*
- *We will follow California's ACF and EPA's GHG Phase 3 timing for our deployments, and anything beyond that will be opportunistic if costs align. Customer requests will also increase our transition pace beyond the regulatory requirements.*
- *Fleet conversion is expected to include deployment of electric vehicles over the next decade to support sustainability goals.*
- *Contingent upon regulations. Range on current products is greatly lacking.*
- *I currently have two light-duty electric vehicles that we use for visiting job sites. I plan to incorporate one 26' class 6 BEV truck either in Q4 2023 or Q1 2024 depending on when we can actually get an order placed.*
- *5 to 10 years.*
- *Within 5 years, but may be forced to implement sooner.*
- *Not sure, watching the market and will decide as technology matures.*
- *Applied for funding. Will find out this summer if we received it. It is extremely expensive right now to do this outside of California or New York state. And not sure if the OEMs will be able to support the volume of what is needed to comply with regulations coming.*
- *We are not at this point. Cannot answer some questions.*
- *Testing in 3 to 5 years*



*Q24: Is there any additional information that ATA should include in our comments to EPA to supplement the transition to electrification? For example: incentives, other alternative fuels, federal excise tax (FET) repeal, weight exemptions, etc.*

Twenty-five individuals responded with comments to this question. The following responses are representative of those received:

- *Alternative fuels, incentives.*
  - *Weight exemptions and alternative fuels. Specifically, locally produced renewable diesel and dairy digester gas (negative emissions!).*
  - *The broad-brush approach to these policies is not the right model.*
  - *Focus on renewable diesel. It's far cleaner than even BEV vehicles when you take into account the full life cycle of the vehicle and electrical generation. It runs in the current fleet of trucks and requires no new distribution infrastructure.*
  - *Lack of incentives other than in California. FET a huge penalty for current equipment as well as ZEVs. Need practical solutions, not hypothetical.*
  - *The final cost to the average consumer will be horrific if we continue down this path.*
  - *Lessen the regulations and make them more affordable so small businesses like ours should be able to survive. These emissions regulations are literally putting us out of business.*
  - *Incentives are not sufficient. The \$40,000 tax rebate is nice, but it doesn't touch the business case for a current zero-emission, Class 8 truck that now costs over \$400,000 and can't do a typical diesel truck's work in a day. EPA should also be looking at overall infrastructure timing for both electricity and hydrogen. The amount of each 'fuel' required is staggering for Class 8 trucks alone, and even the GHG Phase 3 timing is optimistic to support the volumes of vehicles that will be required for compliance. Weight ex-*
- *emptions must be treated very carefully, as we could damage our already fragile roadways by going too far for the sake of accommodating overweight technology.*
  - *No one has a clue how time consuming and confusing this is for the small and mid size carriers. We are currently fighting so many battles and now another one coming at us! How many are just going to give up? This could be devastating to the supply chain!*
  - *Incentives for BEVs are important and weight exemptions should be considered.*
  - *Allow more time for these unproven technologies to be real world tested before mandating their use. In addition, have one rule instead of state by state provisions.*
  - *We need incentives, credits, and grants in other markets besides California. To my knowledge, Arizona does not have much to offer currently. We will also need a weight exemption as a BEV 26' box truck will weigh about 21,000 lbs empty. This only gives a legal Class 6 payload of 5,000 lbs. That will be a deal breaker for many movers and truckers that run medium duty.*
  - *EPA ignores the fact there is not enough power available to meet their EV goals. EPA ignores the fact that EVs have a much larger carbon foot print, cradle to grave, than diesel trucks.*
  - *This is another example of the government lacking common sense. In order to meet the demand for electricity power companies will cause more environmental damage than using diesel power will over next 25 years. The economic burden alone will kill thousands of truckers. Sick and tired of government interference.*
  - *Not sure, customers are not going to understand weight reduction requirements do to regulation changes.*
  - *Timing is everything. Radical changes to our industry will result in significant disruptions and cost increases.*

- *I believe that the electric infrastructure is not ready and won't be ready to meet government dreams.*
- *We are under the CAACF regulation and will be looking at 10% in 2027. Needs to be GVW weight accommodation for batteries. FET repeal is good as a stand alone. Need for Government/Industry collaboration with fuel/utility industry to drive infrastructure forward. Need to start messaging that moving forward will not be without cost for consumers (they need to accept that they will pay for it, period). TMC needs to continue leadership in standardizing industry components and operating procedures.*

## **CONCLUSION**

The majority of those responding indicated little or no experience with either BEVs or hydrogen fuel cell vehicles. Of those that did report experience, a majority reported being either greatly dissatisfied or dissatisfied with respect to range, charging times and cost. A near majority reported similar dissatisfaction with respect to serviceability. A more favorable

response was given to maintainability and durability, with half or nearly half of respondents rating this factor as “neutral.” In all five categories, less than 12 percent rated them as either greatly satisfied or satisfied.

While most respondents did not have current experience with BEVs or hydrogen fuel cell vehicles, 50 percent reported they expect to have to include them in their fleets, mainly to comply with anticipated future regulations. Respondents are generally negative regarding the anticipated payback period for the new technologies as compared to their existing fleet inventory, and many expressed concern over long lead times for charging station installations and infrastructure challenges.

In order to compensate for these perceived challenges, many reported needing weight exemptions, financial and tax incentives and extended rollout timetables for regulatory compliance if BEVs and hydrogen fuel cell vehicles are to be successfully integrated into their fleet operations. □



## FUTURE TMC MEETINGS

### **CLEVELAND, OHIO**

September 17-21, 2023

2023 Fall Meeting

& National Technician Skills Competitions

Huntington Convention Center

To Register: <http://tmcfall.trucking.org>

### **NEW ORLEANS, LA.**

March 4-7, 2024

2024 Annual Meeting

& Transportation Technology Exhibition

Ernest N. Morial Convention Center

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### **Technology & Maintenance Council**

A Technical Council of  
American Trucking Associations



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