



Center of the American Experiment

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### **Organization of this Comment**

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2. Executive summary and policy recommendations.
3. LEV and ZEV regulations infringe on the property rights of Minnesota auto dealers and harm the viability of their businesses.
4. ZEV rule will force auto dealers to stock electric cars that are not profitable and have limited demand.
5. LEV and ZEV rules will not increase consumer choice.
6. LEV and ZEV mandates will increase costs for consumers.
7. Environmental impacts of the proposed LEV and ZEV standards.
8. Disparate impacts on minority and low-income communities.
9. There is no legal basis to implement LEV and ZEV rules under Minnesota law.
10. Conclusions.

Center of the American Experiment (American Experiment) submits the following comments to the Minnesota Office of Administrative Hearings (OAH) regarding the adoption of California's Low-Emission Vehicle and Zero-Emission Vehicle air pollution standards (Revisor's ID R-4626).

## **1. About Center of the American Experiment**

Center of the American Experiment is Minnesota's leading public policy organization. The Center is more than a think tank. It not only researches and produces papers on Minnesota's economy, education, health care, energy, environment, employee freedom, and state and local governance, it also crafts and proposes creative solutions that emphasize free enterprise, limited government, personal responsibility, and government accountability.

American Experiment's staff advances those solutions by drafting legislation, testifying before legislative committees, placing op-eds in newspapers and magazines across the State of Minnesota and nationally, appearing on radio and television news programs, holding town meetings, and lobbying. Further, American Experiment conducts grass roots advertising campaigns on radio and on the internet, which bring the key findings of the Center's research papers to millions of Minnesotans. And the Center carries out investigative reporting, uncovering waste, abuse of power and ineptitude in Minnesota's state and local governments, schools, and unions.

For more than 25 years, Center of the American Experiment has been the most impactful and effective public policy organization in Minnesota. It leads the way in creating and advocating policies that make Minnesota a freer, more prosperous, and better-governed state.

## **2. Executive Summary and Policy Recommendations**

On Dec. 21, 2020, the Minnesota Pollution Control Agency (MPCA) published a Notice of Intent to Adopt Rules with a Hearing for the California Low Emission Vehicle (LEV) and Zero Emission Vehicle (ZEV) mandates in the *State Register*.

The rules would enforce regulations promulgated by the California Air Resources Board (CARB) to reduce greenhouse gas (GHG) and other emissions from the transportation sector in Minnesota and force auto manufacturers to stock a minimum number of electric vehicles in the state.

Center of the American Experiment recommends that the Administrative Law Judge (ALJ) find the rules to be neither needed nor reasonable and thus disapprove the rules.

Furthermore, Center of the American Experiment recommends the following policies be adopted in pursuit of vetting LEV, ZEV, and any future greenhouse gas emissions regulations to be promulgated by MPCA:

1. Any proposed greenhouse gas regulation should clearly state how much it would reduce future global temperatures in clear and understandable terms.
2. MPCA should be required to make all data used in its technical support documents publicly available in easily accessible Excel spreadsheets and provide justification for the data it uses.
3. MPCA air modeling should also attempt to quantify health impacts under more realistic exposure paradigms (See Air Modeling).

### **3. LEV and ZEV regulations infringe on the property rights of Minnesota auto dealers and harm the viability of their businesses.**

First and foremost, the proposed LEV and ZEV regulations are an infringement on the private property rights of auto dealers to operate their businesses in the way that best serves their own financial self-interest, the interests of their employees, and most importantly, their customers.

#### **LEV Mandates**

The LEV mandates will require all new internal combustion engine vehicles sold in the state to meet California's standards for carbon dioxide emissions. MPCA and other stakeholders acknowledge that these vehicles will be more expensive than non-LEV vehicles and will increase the cost of driving in Minnesota.

#### **ZEV Mandates**

Because auto manufacturers will be forced to "deliver for sale in Minnesota a certain number of vehicles with ultra-low or zero tailpipe emissions each year, including battery electric vehicles (EVs), plug-in hybrid electric vehicles (PHEVs), and hydrogen-fueled vehicles," under the proposed ZEV standards, the rules would require car dealers to offer money-losing cars on their lots. Carmakers will be forced to raise prices on ICEVs sold in the state to make up for losses on EVs, further contributing to rising prices for new vehicles sold in Minnesota.

#### **Scope of the Rules**

MPCA has also been ambiguous about the scope of the ZEV standard moving forward. This is worrisome because California Gov. Gavin Newsom announced he would direct CARB to draft regulations banning the sale of gasoline or diesel-powered passenger vehicles in the state after 2035.<sup>1</sup> MPCA has indicated in listening sessions that Minnesota would not be bound to California's LEV or ZEV standards if the state increases the stringency of the regulations, and that MPCA would need to engage in a new rulemaking to adopt California's most-recent standards.

However, MPCA's Statement of Need and Reasonableness (SONAR) says:

"The MPCA is proposing to adopt the LEV and ZEV standards "as amended." Incorporation "as amended" means that any future amendments to the incorporated California regulations automatically become part of Minnesota rules. Using "as amended" improves administrative efficiency by reducing the need for rulemakings to maintain consistency with the California rules.

Historically, California has made minor housekeeping updates to its rules every few years. However, when California has conducted a major update to the rules, such as making them more stringent for future model years, California has done so in new rule parts. Because California uses new rule parts, these major updates would not be adopted automatically into Minnesota's rules. The decision to incorporate these rule updates or revert back to the backstop federal standards would still need to be considered on a case-by-case basis through Minnesota state rulemaking." (p. 41).

Past performance is no guarantee of future results. California has become more aggressive in limiting the types of vehicles that Californians will have access to in the future, and as more states adopt LEV and ZEV standards, "as amended," CARB may feel a growing pressure to update their rules without issuing new rule parts. Such a change in the way CARB updates its rules would bind Minnesota to ever-increasing standards irrespective of whether they serve the best interests of Minnesota families.

These factors represent real challenges for operating a car dealership in Minnesota under the proposed regulatory regime, which is why we believe the ALJ should deem the proposed rules as not needed or reasonable and not rationally related to the agency's objective. We believe the rule also "improperly delegates the agency's powers to another agency, person, or group." Minn. R. 1400.2100(F).

Protecting the private property rights of auto dealers to stock the cars that are most popular with their customers is the best way to maintain the health of the auto dealer industry in Minnesota, which supports more than 97,000 jobs.<sup>2</sup>

Electric cars represented just 0.74 percent of new vehicles sold in Minnesota in 2018, meaning Minnesota consumers are not yet convinced EVs can replace ICEVs for personal transit. Center of the American Experiment outlines several factors contributing to low EV adoption in subsequent sections.

#### **4. ZEV rule will force auto dealers to stock electric cars that are not profitable and have limited demand.**

MPCA presentations indicate the ZEV rules will require that 14,000 EVs be offered for sale every year in Minnesota. According to Atlas EV Hub, this number exceeds the number of EVs that have been registered in Minnesota over the last 10 years.<sup>3</sup>

Figure 1 shows, as of February 2020, there were 7,322 battery electric vehicles (BEV) registered in Minnesota and 5,556 plug-in hybrid electric vehicles (PHEV), for a total of 12,878 EVs.

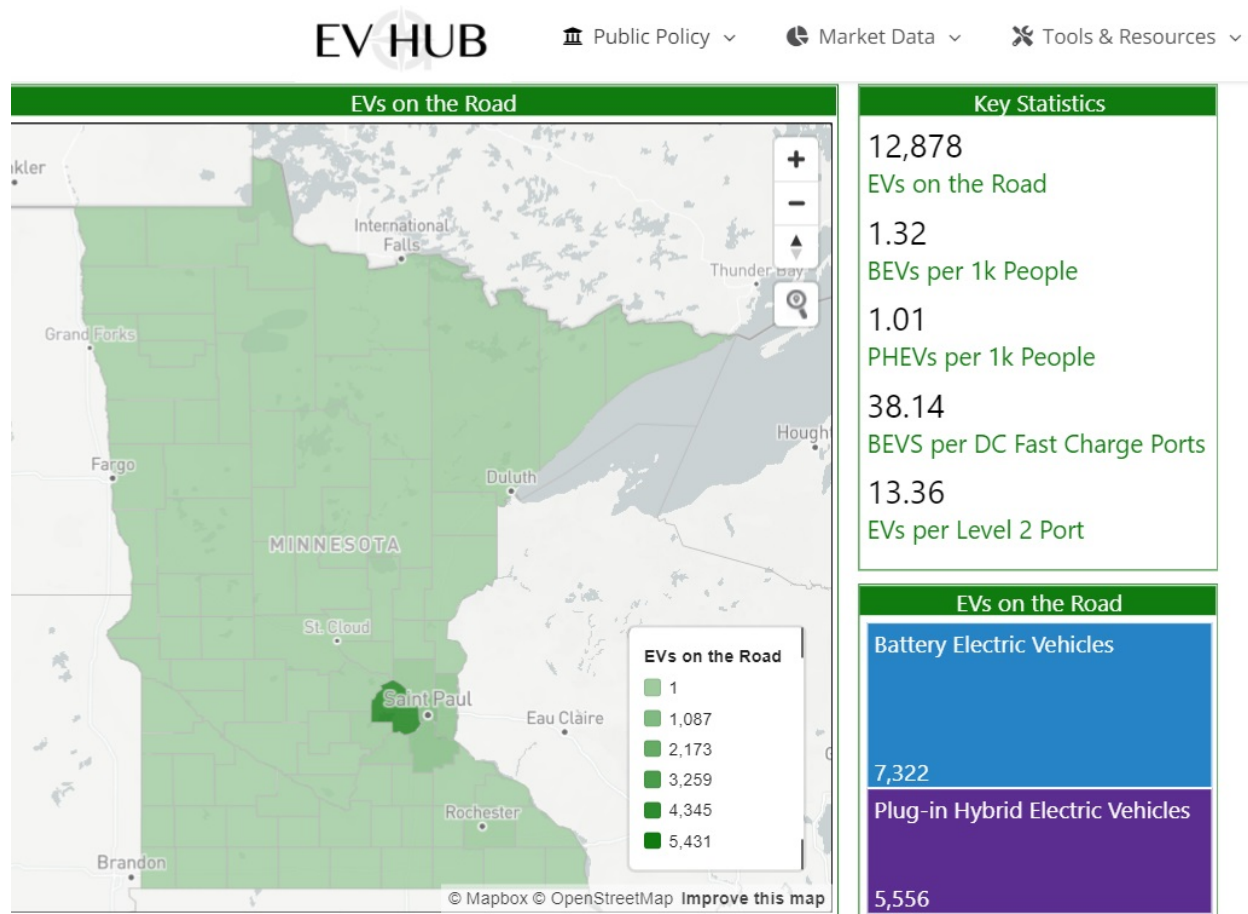


Figure 1. As of February 1, 2020, there were fewer EVs registered in Minnesota (12,878 BEVs and PHEVs) than would be required to be "offered for sale" every year in Minnesota under the ZEV mandates. Figure modified from AtlasEVHub.

American Experiment does not see how mandating more electric vehicles be "offered for sale" each year than have been sold in the last 10 years can be considered reasonable by MPCA, especially when we consider that electric vehicles are not profitable.

### Not Profitable

According to the Los Angeles Times:

"Partly because of their high costs, electric cars so far have proved unprofitable. Carmakers are selling them at a loss. Government subsidies on electric car purchases have proved necessary to keep consumers interested. Carmakers hope that production levels will reach the point where per-car costs fall, subsidies are no longer necessary and EVs can be sold at a profit. When that point will be reached, no one can say."<sup>4</sup>

An analysis by McKinsey & Company states:

"There is a problem: today, most OEMs do not make a profit from the sale of EVs. In fact, these vehicles often cost \$12,000 more to produce than comparable vehicles powered by internal-combustion engines (ICEs) in the small- to midsize-car segment and the small-utility-vehicle segment (Exhibit 1). What is more, carmakers often struggle to recoup those costs through pricing alone. The result: apart from a few premium models, OEMs stand to lose money on almost every EV sold, which is clearly unsustainable.

...

Current thinking holds that the industry will continue to produce EVs—largely because it has little alternative in the face of stringent fuel-economy and emissions policies—and that the industry will, in the meantime, absorb the losses."<sup>5</sup>

By imposing California's ZEV mandate on Minnesota, the agency would force automakers to sustain losses by mandating cars that few Minnesotans want to buy. The cost of these losses would be recouped by raising prices on the ICEVs that people actually wish to purchase.

### **Barriers to EV Adoption**

One reason EVs have failed to naturally gain a larger market share is that they are significantly more expensive than their gasoline or diesel-powered counterparts. For example, a Chevy Bolt has a manufacturer's suggested retail price (MSRP) of \$36,620, while a Chevy Malibu has an MSRP of only \$22,095, meaning the Bolt costs about 66 percent more than the Malibu.

The premium price tag for EVs is a major barrier to entry that most Minnesota families simply can't afford, especially when the fact that traditional vehicles are more useful and versatile than electric vehicles is considered. Research from MIT indicates the electric vehicles will remain more expensive than internal combustion engine vehicles (ICEV) for the foreseeable future.

EV advocacy groups frequently claim that electric vehicles will have lower lifetime ownership costs because of reductions in battery prices. However, MIT researchers concluded it is likely to take another decade just to eliminate the difference in the lifetime costs between the vehicle categories, which factor in higher fuel and maintenance expenses for ICEVs compared to EVs.

### **MIT Research on The Higher Costs of EV Ownership**

The MIT Energy Initiative warns that EVs may never reach the same sticker prices as ICEVs if they continue to rely on lithium-ion batteries. Lithium-ion is the energy storage technology that powers most consumer electronics, according to the MIT Technology Review.<sup>6</sup>

These findings stand in sharp contradiction to studies by other research groups which have concluded that EVs could potentially achieve price parity with ICEVs within the next five years. However, MIT explains that the steady decline in the cost of lithium-ion batteries, which power

EVs and account for about a third of their total cost, is likely to slow in the next few years as they approach the limits set by the cost of the raw materials.<sup>7</sup>

"If you follow some of these other projections, you basically end up with the cost of batteries being less than the ingredients required to make it, says Randall Field, executive director of the Mobility of the Future group at MIT. "We see that as a flaw."

The MIT report continues:

"Current lithium-ion battery packs are estimated to cost from around \$175 to \$300 per kilowatt-hour [kWh]. (A typical midrange EV has a 60/kWh battery pack.)

A number of commercial and academic researchers have projected that the costs of such batteries will reach \$100/kWh by 2025 or before, which many proclaim is the "magic number" where EVs and gas-fueled vehicles reach retail price parity without subsidies. And they would continue to fall from there.

But reaching the \$100 threshold by 2030 would require material costs to remain flat for the next decade, during a period when global demand for lithium-ion batteries is expected to rise sharply, MIT's "Insights into Future Mobility" study notes. It projects that costs will likely fall only to \$124 per kilowatt-hour by then. At this point, the "total cost of ownership" between the categories would be about the same, given the additional fuel and maintenance costs of gas-fueled vehicles. (Where these lines cross precisely depends heavily on local fuel costs and vehicle type, among other factors.)

But the sticker price of an EV with 200 miles of range would still run thousands of dollars more than a comparable gas-fueled vehicle in many areas. While closing the gap on total cost of ownership would be a solid step for electric vehicles, the average consumer is very sensitive to upfront price tag—and what it equates to in monthly payments."

MPCA will undoubtedly receive comments claiming that EVs and ICEVs have already achieved, or will soon achieve, cost parity. However, the agency should carefully examine the assumptions used to come to these conclusions. It is doubtful the studies used to support these claims will have more credibility than MIT.

As stated earlier in these comments, EVs are currently unprofitable, and the assumed road to profitability appears to be paved with unrealistic assumptions of future cost declines. If MIT is correct, the need to pass on losses incurred from the sale of EVs onto purchasers of ICEVs means the proposed regulations would burden traditional car buyers beyond the additional costs incurred by imposing LEV standards.

At the very least, MPCA should use MIT's cost projections for lithium-ion battery technology to inform at least one scenario for the potential reductions in battery costs and the economic impacts ZEV regulations would have on Minnesota.

## **EVs are Less Dependable than ICEVs**

Even if EVs and ICEVs reach sticker-price cost parity, there are legitimate reasons to doubt Minnesota consumers will choose to purchase 14,000 EVs per year. Compared to traditional engines, EV's have more-limited range, and this range declines substantially during periods of cold weather.

These factors are likely a key reason why many current EV owners also own an ICE vehicle, and they why Metro Transit has reserves course on its announcement to stop purchasing buses that run on diesel fuel by 2022 and purchase electric buses, instead.

## **Range Anxiety**

According to a study conducted by Volvo, 58 percent of drivers cited range anxiety, the fear that they will run out of power before being able to charge their vehicle, as their main reason for avoiding purchasing an electric car, while another 49 percent fear the low availability of charging stations.<sup>8</sup>

According to MYEV.com, there eight EVs models for MY 2019 that can run for more than 200 miles before needing to be recharged.

According to the website, new, longer-range models this year include the Audi e-tron at 248 miles, the Nissan Leaf e+ variant at 226 miles, and the Hyundai Kona Electric that can run for an average 258 miles.<sup>9</sup> The Tesla Model S has the longest range, with 370 miles, but it also retails for \$86,200, according to Kelley Blue Book.<sup>10</sup>

Charging times for these models range from 9.5 hours to 11.5 hours for home charging, although "fast charging" stations can charge some batteries up to 80 percent of their charge in 20 to 30 minutes. Short ranges combined with long charging times result in EVs having less utility than traditional vehicles. This is particularly important to realize in a state as large as Minnesota.

People rarely purchase vehicles based on their average daily use, they purchase them with other factors in mind, such as road-trips or family vacations.

For example, someone who grew up in Moorhead but moved to Minneapolis would likely have to charge their EV at least once if they were to travel home to visit relatives. This would make a 3.5 hour drive closer to four hours, if not longer. The number of times this EV driver would have to stop and charge their car would increase by two or three times during the coldest winter months, potentially lengthening the trip to more than five hours because cold weather greatly reduces the range of EVs.

## **Reduced Range in Cold Weather**

According to AAA, EVs can lose more than 40 percent of their battery range when temperatures reach 20 degrees Fahrenheit and battery range fell by more than 50 percent during the Polar



Vortex of January 2019 (See Figure 2).<sup>11,12,13</sup> Cold temperatures also result in longer charging times, which can further reduce the utility of electric vehicles.

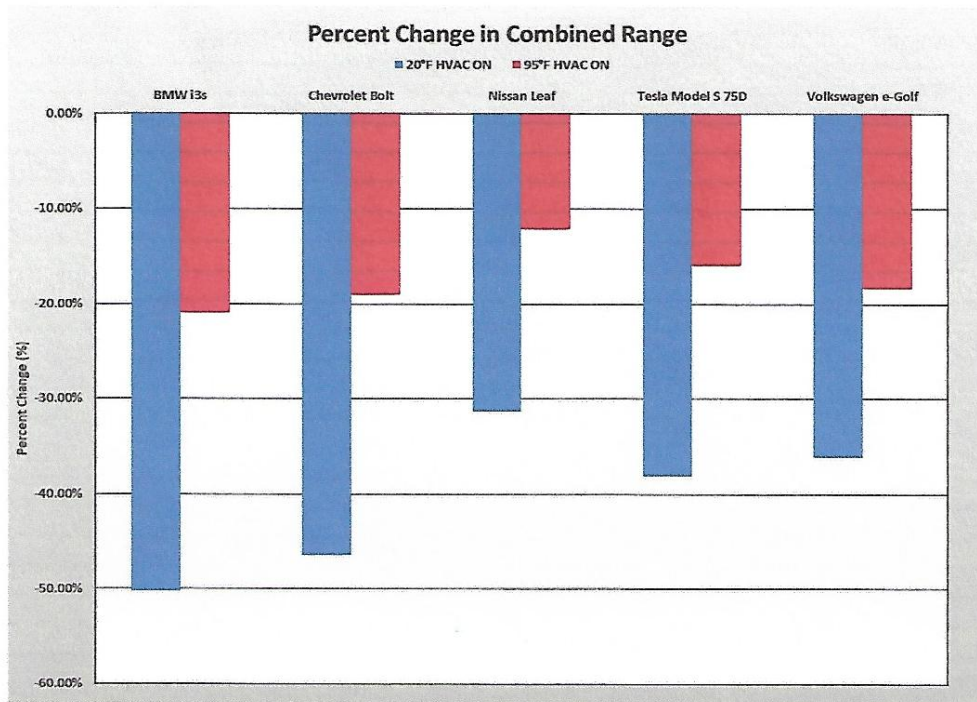


Figure 51: Percent change in combined driving range relative to testing conducted at 75°F Image Source: AAA

Figure 2. Electric vehicles experience reduced range during periods of cold weather and warm weather. At 20 degrees Fahrenheit, all models studied by AAA experienced a 30 percent reduction in range, and some cars experienced a 50 percent reduction in EV range when using their heating systems.

Other studies have come to similar conclusions. According to the experience of a Chevy Bolt driver in Quebec:

"Plus, if I had connected the Bolt with the provided 120V charging cord, it would have taken it 50 hours to charge. Fifty! I've also been told that the 120V charger is too weak for Canada's savage conditions. At -40 degrees, that tiny cord is barely strong enough to provide heat to the batteries.

Luckily, my phone app told me there was a Level 2, 240V public charger just half a mile from my home at the cost of \$1 an hour. It would take my Bolt nine hours to charge."

Studies in Germany have also corroborated the fact that electric cars lose utility in winter. In Minnesota, this means that the expected environmental benefit of ZEV rules could be mitigated by the fact that commuters may choose to use an ICEV during cold periods rather than ZEVs.

Fuel economy is also diminished during periods of cold weather. According to the AAA study, on average, HVAC use at 20°F resulted in a 41 percent decrease of combined driving range and a 39 percent decrease of combined equivalent fuel economy when compared to testing conducted at 75°F (See Figure 3).

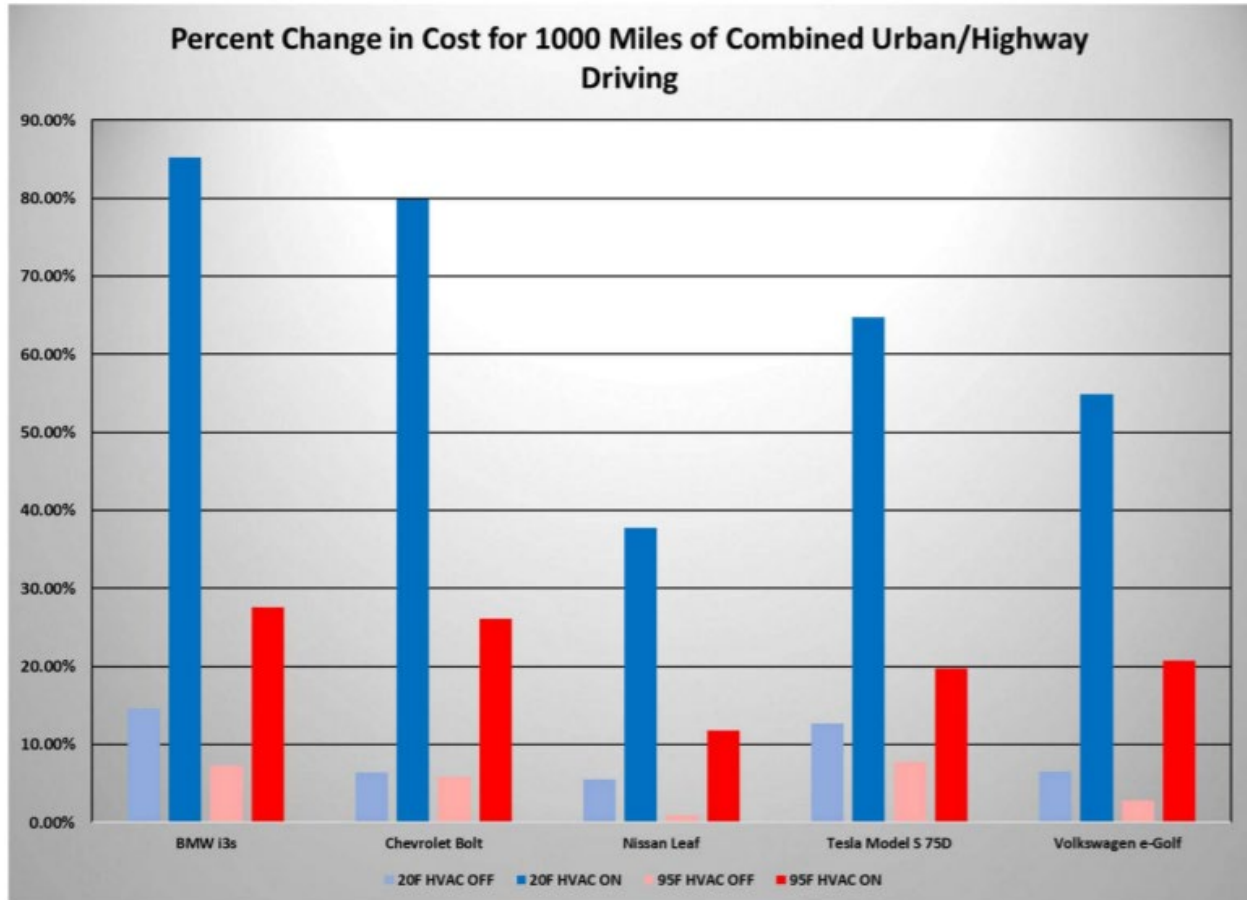


Figure 3. According to AAA, the cost of driving an electric car while using the heating systems during periods of 20-degree Fahrenheit weather increases from 38 percent to 85 percent, depending on the make and model of the electric vehicle.

All vehicles experience reduced fuel economy during periods of cold temperatures, but the impact of cold weather is more pronounced with electric vehicles because their batteries must use stored energy to create heat, whereas ICEVs use heat that is generated by the combustion of fuel to heat the cabin. As a result, American Experiment does not believe it is needed or reasonable to mandate 14,000 EVs to be stocked in Minnesota when they will experience reduced range and reliability for much of the year.

### Real-World Experiences Validate Range and Reliability Concerns

Real-world experience shows that range and reliability concerns over EVs are warranted. In California, Governor Newsom instructed the Department of General Services, the state's business

manager that oversees vehicle purchases for California's fleet, to no longer purchase gas-powered sedans. The immediate ban on state purchases of cars powered only by gas will include exceptions for public safety vehicles.<sup>14</sup>

The exclusion of public safety vehicles is a nod to sanity in an otherwise unwise policy. It is telling that the governor acknowledges the essential nature of ICEVs for public safety (due to their superior performance attributes), and this exclusion demonstrates that EVs are not ready to be the primary mode of transit for private or public transportation services.

## **Minnesota Examples**

Municipalities in Minnesota who have sought to electrify public transit have already experienced problems in their limited time using EVs.

Duluth has already experienced cold-weather headaches with its costly line of electric buses, as detailed in the Duluth News Tribune article "DTA Temporarily Pulls Electric Buses," over braking problems on icy hillside avenues and a lack of on-board heat.<sup>15</sup> Furthermore, Duluth's experience highlights the problems with attempting to mandate ZEVs for mass transit, because DTA's buses have auxiliary heat powered by a diesel engine to ensure passengers can ride in comfort without greatly reducing the range of the bus battery during cold weather.

Since the CAA requires states wishing to adopt California's standards to do so exactly, Minnesota has no flexibility within the rules to adopt Minnesota-specific changes. As a result, it is unclear whether DTA's electric buses could qualify as "zero emission" vehicles.

Another example occurred in Minneapolis with the Metro Transit fleet.

In late 2018, Metro Transit boldly proclaimed the agency would add electric vehicles to its fleet and stop buying diesel-powered buses entirely by 2022.

However, after experiencing numerous problems with its eight electric buses in a pilot program, the agency has smartly announced a \$122 million plan to purchase 143 buses that run on "biodiesel."<sup>16</sup> As the Department of Energy notes, "biodiesel" vehicles and conventional diesel vehicles are one and the same.<sup>17</sup>

In October, the Star Tribune wrote an article entitled "Metro Transit Temporarily Pulls Electric Buses from C Line Because of Problems with Chargers."<sup>18</sup> According to the article, eight electric buses on the newly formed C Line would be taken out of service until defects with the charging mechanisms could be fixed. Diesel-powered buses were used to continue service on the line.

Cost likely played a large factor in Metro Transit's decision to hit reverse on its electric vehicle ambitions. Electric buses cost approximately, \$1.2 million per bus, whereas the diesel buses Metro Transit is considering will cost \$748,000, a difference of \$452,000 per bus, or 60 percent. Buying diesel buses instead of electric buses will save the agency \$64.6 billion and provide better options for riders.

According to the Star Tribune article:

"Metro Transit officials said the pilot program involving eight electric buses on the C line arterial bus route has proved challenging. The first electric buses were rolled out to great fanfare in 2019, but the system soon encountered issues with charging equipment. On Tuesday, the electric chargers overheated, resulting in all eight buses being sidelined.

Cold climates like Minnesota's can also sap electric vehicle charges. The plan adopted three years ago called for half of the area's new rapid transit buses to be electric. But Metro Transit officials now say electric buses are not a good fit because the new lines cover too much territory, making establishing a network of charging stations challenging.

Those routes include the Orange Line, a 17-mile bus rapid transit project connecting downtown Minneapolis to Burnsville, which will begin service later this year; the D line, arterial bus rapid transit connecting Brooklyn Center to the Mall of America, which is slated to begin service next year; and the B line, linking Uptown to downtown St. Paul, which will open in 2024.

"It's too long," said Brian Funk, Metro Transit's deputy chief operating officer-bus. "They just do not fit the profile, given the operating range."

Residents in Greater Minnesota have been making these same arguments to the MPCA for 18 months. Mandating automakers to stock 14,000 electric vehicles per year in the state when government institutions in Minnesota are scrapping their plans to purchase electric vehicles proves the regulations are not reasonable. Metro Transit's decision also shows that diesel buses, not electric buses, are needed to provide the reliable transit service that many Minnesotans depend upon.

## **New Mexico**

Duluth and Minneapolis are not alone. Problems associated with electric buses prompted the city of Albuquerque to return the electric buses they had purchased, according to an article in CityLab.<sup>19</sup> According to the article:

*"Albuquerque recently made headlines in the urban public-transit world when the municipal transit agency, ABQ RIDE, returned the BYD-made electric buses it had ordered, finding them deficient. The city had paid \$1.2 million apiece for these buses, and after it returned them, it bought diesel buses from New Flyer for \$870,000 each."*

The Met Council realized that spending additional taxpayer resources on electric buses that do not have the same performance or reliability characteristics as diesel-powered buses is a bad policy. However, it would be worse for the Governor and MPCA to enshrine those policies in the Minnesota administrative code.

Temperatures are frequently below 20 degrees F in Minnesota and mandating that auto dealers offer cars that have not demonstrated that they are capable of delivering the same performance as ICEVs at a comparable cost is bad public policy.

## **Conclusion**

Given the dependability challenges faced by EVs in Minnesota's cold climate, we do not believe it is reasonable to mandate auto manufacturers to stock 14,000 EVs in the state every year.

## **5. LEV and ZEV Mandates Will Not Increase Consumer Choice**

One argument the Gov. Tim Walz and his administration are using to justify the California car mandates is that these mandates will increase consumer choice. However, we believe the administration is doing so under false pretenses and that the ZEV mandates will require auto dealers to stock more electric vehicles that few Minnesotans want.

## **Concerns LEV Standards Will the Number of Reduce Light-Duty Vehicles "Offered for Sale" in Minnesota**

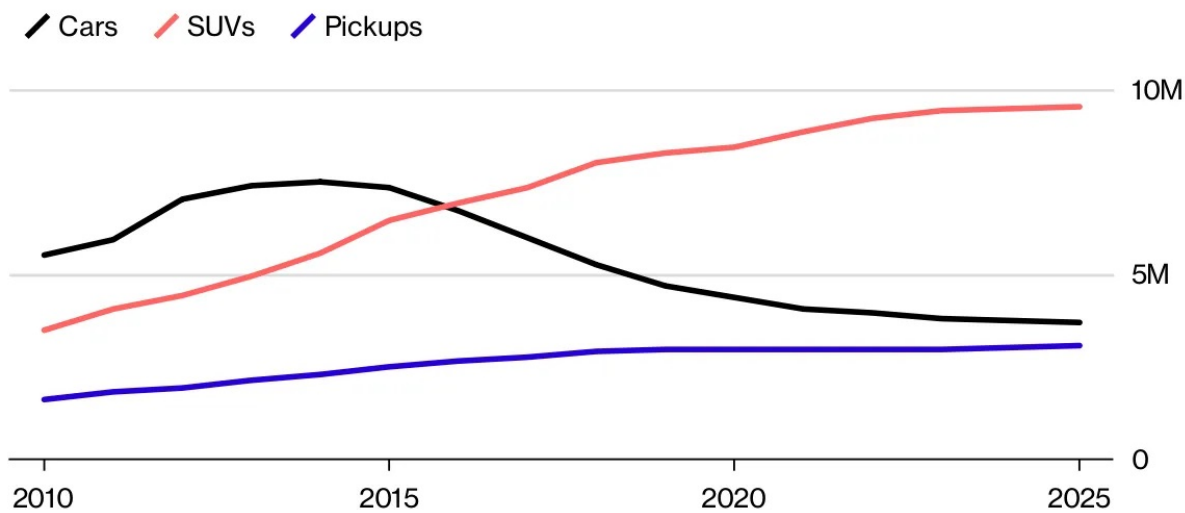
American Experiment is concerned that the fleetwide emissions standards for greenhouse gas emissions will reduce the number of light-duty vehicles offered for sale in Minnesota to help automakers reach their mandates.

In their supporting documents, MPCA estimates new vehicle sales will consist of 75 percent light-duty trucks, and 25 percent passenger cars. This assumption for passenger vehicle sales is slightly higher than vehicle sales in Minnesota in 2018, which were 21 percent passenger vehicles and 79 percent light-duty trucks.<sup>20</sup>

We believe these are small discrepancies, but research from *Bloomberg* indicates that SUVs are a quickly-growing segment of the vehicle market, whereas cars sales have plunged 30 percent in a four-year timeframe (See Figure 4).<sup>21</sup>

## Sedan Slaying

Car sales plunge about 30% in span of just four years



Note: U.S. vehicle sales figures after 2018 are projected

Source: LMC Automotive

**Bloomberg**

*Figure 4. SUV sales are growing segment of the U.S. auto fleet, whereas cars have fallen in market share since 2015.*

While MPCAs current projections are not far off current vehicle sales, the trend in Minnesota, and nationally, toward crossover SUVs suggests these vehicles may continue to grow in market share relative to smaller vehicles.

Minnesota consumers already have the freedom to choose a vehicle that get higher fuel mileage, but more often than not, they hold other factors such as size or safety features, to be a higher priority.

### **ZEV Rules Mandate EV Models That Virtually No One Wants**

MPCA claims the rules are needed to ensure that Minnesotans have access to the electric vehicle models they desire but cannot currently access in Minnesota.

However, comparing current EV registrations from Atlas EVHub and survey data from CleanTechnica.com, a website dedicated to promoting renewables and electric vehicles, suggests there is virtually no demand for the models that are not currently offered in Minnesota, undermining this argument by the Walz administration.<sup>22</sup>

EV registration data from Atlas EVHub shows the market for electric vehicles in Minnesota is dominated by Tesla, and no other automaker is even close to the same volume (See Figure 5).<sup>23</sup>

The graph below shows that Tesla accounts for 65 percent of BEV registrations, with Nissan accounting for approximately 20 percent of the BEV market.

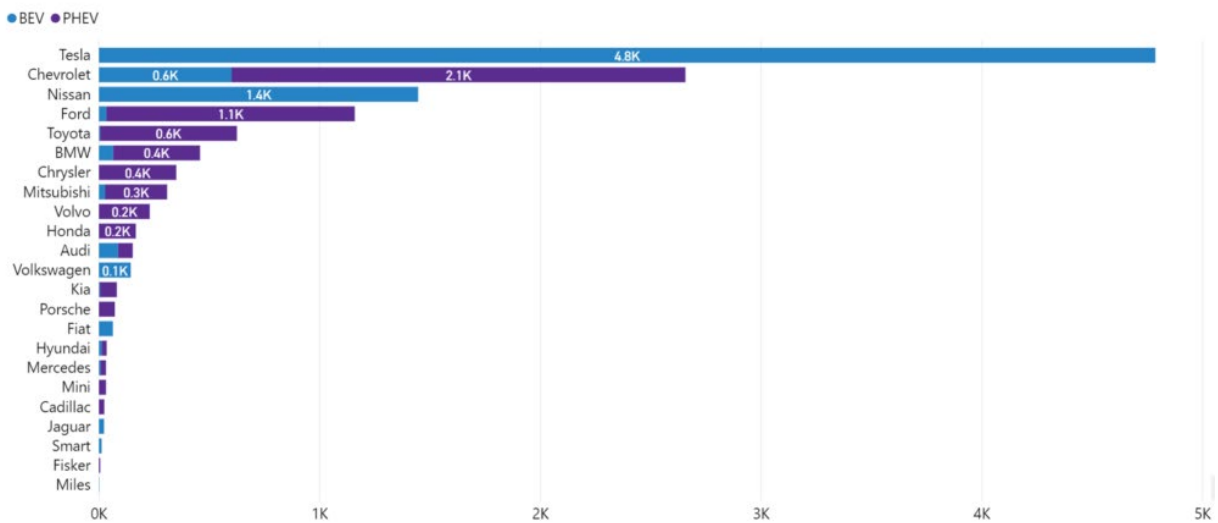
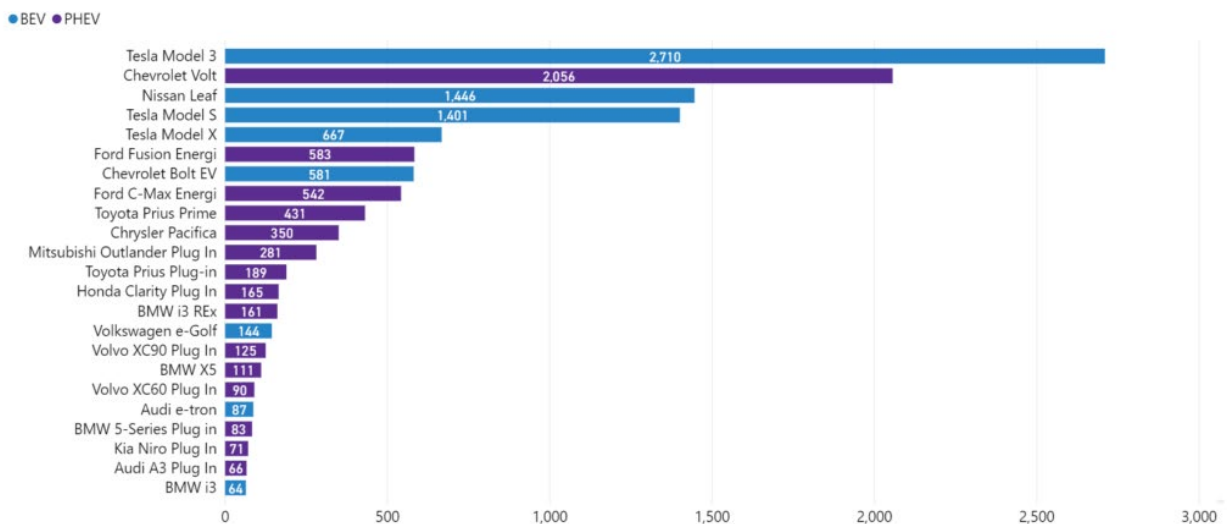


Figure 5. Registration data from Atlas EVHub shows Tesla EVs are by far the most popular BEVs in Minnesota.

The data from Atlas EVHub also show the most popular EV models in Minnesota. Here we can see that the Tesla Model 3, the most affordable Tesla offered, has the highest market share, accounting for about 37 percent of BEV registrations in Minnesota (See Figure 6).

Unsurprisingly, the Chevy Volt leads PHEVs, and the Nissan Leaf is the second most-owned BEV.



*Figure 6. The most popular EV models in Minnesota are the Tesla Model 3, Chevy Volt, Nissan Leaf, and other Tesla models.*

Part of MPCA's justification for imposing these regulations on Minnesotans is a claim that the rules will increase consumer choice and give Minnesotans access to the EVs they want but currently cannot get because they are not offered for sale in Minnesota.

Registration data show that Minnesotans already have access to all of the top-selling EVs in the nation, meaning the Walz administration is not expanding consumer choice. It could be argued that these cars are the biggest sellers because they are more available than other EV's, and not because they are the first choice of would-be EV consumers, but CleanTechnica's surveys do not support this argument.

### **Survey Data Suggest Low Demand for EVs Not Currently Offered in Minnesota**

The CleanTechnica survey asked current EV drivers which model EV they would be most likely to purchase next. As you can see, Tesla Model 3 and Model Y are the most popular choices, with a generic "other" making 13 percent (See Figure 7). The Bolt, LEAF, and Kona constitute another 21 percent of the would-be EV market, and all are available in Minnesota.

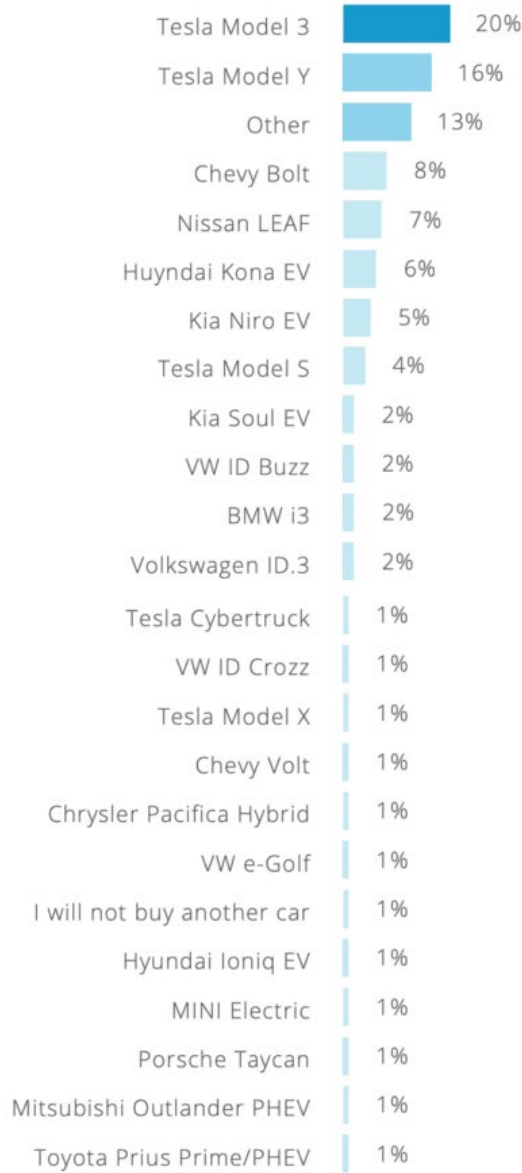
MPCA has attempted to demonstrate the need for these rules by saying there is a large demand for the Kia Nero EV, which is not currently offered for sale in Minnesota. The CleanTechnica survey data suggests the Agency's argument is based on anecdotes and is not representative of broader consumer demand. Of current EV drivers, only 5 percent want a Kia Nero EV for their next vehicle.



## What do you think your next EV model will be?

### EV DRIVERS

#### US & CANADA



*Figure 7. The most sought-after EVs on the market include the Tesla Model 3, and Model Y, "Other," Chevy Bolt, Nissan Leaf, Hyundai Kona EV and Tesla Model S, all of which are offered for sale in Minnesota. Only 5 percent of respondents wanted a Kia Niro EV.*

While proponents of the ZEV mandates often claim the rules are needed due to a large, pent-up consumer demand for EVs not offered in Minnesota, this survey seriously undermines this argument.

In actuality, every single electric car in the top eight sellers nationally is available for sale in Minnesota, and could be purchased today if the consumer is so inclined.

Adopting California's car regulations and forcing auto manufacturers to stock 14,000 EVs in the state annually for the sake of the small number of Minnesotans who want a Kia Niro EV would be a gross infringement on the rights of auto dealers to conduct their business as they see fit to promote cars that few people want. It is difficult to see how MPCA can determine that the ZEV vehicles are needed or reasonable to expand consumer choice.

## **6. LEV and ZEV Mandates Increase Costs for Consumers and Will Not Pay for Themselves**

The Walz administration claims the proposed LEV and ZEV standards could result in a net cost of \$23 million in total average annual net consumer costs or a net savings of \$48 million in total average net consumer savings per model year over vehicles' lifetimes for the 10-year time frame spanning model year 2025 to 2034. Over ten years, MPCA claims these would translate to between an estimated \$236 million net consumer costs to \$476 million in net consumer benefits over vehicles' lifetimes for the first 10 model years of implementation of the proposed rule.

However, we believe these projections are underestimating the increase in consumer costs for the LEV standards, and the cost analysis for the ZEV standard is based on the incorrect assumption that EVs are "generally cheaper to own and operate over the life of the vehicles due in large part to fuel and maintenance savings."<sup>24</sup>

Research from the Colorado Auto Dealers Association estimates the rules will cost substantially more than MPCA's assumptions, and the MIT study disputes the notion that EVs have reached cost parity with ICEVs. Lastly, rising electricity prices will diminish fuel savings for EVs in the near future.

### **Increasing Costs from LEV Standards**

The MPCA SONAR document states: "Once the LEV standard has reached its maximum stringency in model year 2025, the average up-front purchase price of a new LEV-certified vehicle may be \$900 to \$1,200 more than a SAFE-certified vehicle, depending on the vehicle size and type. An average new LEV-certified vehicle in Minnesota is estimated to be approximately \$1,139 more than a new SAFE-certified vehicle, since more light-duty trucks are sold in Minnesota than passenger cars."<sup>25</sup>

Colorado was the most recent state to adopt California's LEV standards. According to the Colorado Automobile Dealers Association (CADA) the rules would increase the average sticker cost for vehicles by \$2,110 per car produced between model year (MY) 2021 and 2025, and increase the average sticker price by \$2,098 for MY 2025 (See Table 1).

CADA's cost increase estimates are nearly twice as large as those developed by MPCA. Even at this lower cost, MPCAs analysis did not show a clear savings from lower fuel costs.

For example, MPCA's slides state: "If there is a potential price difference in the future, consumers who buy LEV- certified vehicles would essentially break-even due to fuel savings."

Using CADA's cost increase estimates, consumers would likely lose about \$959 per vehicle over the lifetime of a MY 2025 vehicle, assuming a perfect "break-even" (\$2,098-\$1,139). Assuming approximately 200,000 vehicles are sold each year, this translates into an annual loss of \$191.8 million, or \$1.9 billion over ten years. This rough estimate is in line with CADA's analysis, which found LEV regulations would impose a net cost of more than \$2 billion on Colorado consumers.<sup>26</sup>

KEY FINDINGS REGARDING COLORADO ADOPTING CLEAR		
Metric	Impact	Units
Consumer Payback for MY 2022 Truck	14+	Years
Consumer Payback for MY 2025 Truck	11	Years
Total Value of Gasoline Savings (MY 2021-2025)	0.81	Billion 2018\$
Total Regulation Cost (MY 2021-2025)	2.86	Billion 2018\$
Average Sticker Price Increase for Colorado Vehicle (MY 2021-2025)	2,110	2018 \$
Average Sticker Price Increase for Colorado Vehicle (MY 2025)	2,098	2018 \$

Sources: Energy Ventures Analysis review of, CADA, *Colorado Auto Outlook*, Colorado Division, EPA: *2016 Draft TAR*, NHTSA: *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks*. NHTSA: *Preliminary Regulatory Impact Analysis (PRIA) For the The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks*, July 2018.

Notes:

1. "Payback" is the estimated number of years before a consumer would begin to realize a benefit relative to the additional purchase cost. The payback analysis is based on the NHTSA estimated incremental purchase cost for a new vehicle, 7% vehicle purchase tax, maintenance premium of 0.05%, insurance costs that increases 1% with an increased vehicle cost, annual 12,000 miles vehicle miles travelled, 48-month loan at rate of 4.08% with 20% down payment, discount rate of 3%, values discounted to year of purchase, and a vehicle efficiency gain of 8% for the MY 2022 vehicle and 29.6% for the MY 2025 vehicle.
2. Both fuel savings and total regulation cost are discounted to the first year of implementation at 3% to allow comparison between the numbers.

*Table 1. An analysis by CADA determined it would take more than 14 years for a MY 2022 truck to provide a consumer benefit, and that it would take 11 years for a MY 2025 truck.*

CADA's analysis investigated the "payback time" for a truck for MY 2022 would be more than fourteen years, and payback would be 11 years for a MY 2025 truck (See Table 1). This is problematic because the average vehicle age in Minnesota is 11.8 years, meaning it would take 11 years for consumers to see any fuel benefits.<sup>27</sup>

MPCA should also note that CADA found the total fuel savings of \$812 million were outweighed by \$2.86 billion in direct costs. According to the CADA report:

"In a state where consumers demonstrate a preference for [more] trucks than for cars, EVA [Energy Ventures Analysis] estimates that consumers will see cost benefits of the regulation in the eleventh year of vehicle ownership for a truck purchased at the end of the regulation timeframe. A truck purchased near the beginning of the regulation timeframe will not offer consumers a cost-benefit of regulation over the reasonable life of the vehicle."

Minnesota consumers have a larger preference for large vehicles than those in Colorado. According to *Auto Alliance*, 39 percent of vehicles sold in Colorado in 2018 were cars, 35 percent were crossovers or sport utility vehicles (SUVs), 21 percent were pickups, and 5 percent were minivans.

In contrast, cars represented just 21 percent of new vehicles sold in Minnesota while crossover vehicles represented 44 percent, SUVs accounted for 8 percent, pickup trucks comprised 21 percent, and minivans accounted for 5.3 percent of new vehicle sales in 2018.<sup>28</sup>

Due to consumer preferences in Minnesota, the regulations are likely to have even larger costs with smaller benefits than they would in Colorado. Therefore, LEV regulations would be a net loss for Minnesota's economy and consumers.

### **Increasing Costs from ZEV Standards**

MPCA accepts the inaccurate premise that EVs have lower lifetime ownership costs than ICEVs, but the newly released, comprehensive three-year study by MIT, mentioned above, concluded that electric vehicles are more expensive to operate than ICEVs even after taking higher fuel and maintenance costs for ICEVs into consideration.<sup>29</sup>

In practice, ZEV mandates will increase the cost of ICEVs offered for sale in Minnesota as auto dealers attempt to recoup the costs they will incur when they are forced to purchase the EVs by the auto manufacturers. In this way, ICEV consumers are providing a cross-subsidy to EV drivers.

There will also be several additional societal costs that will be borne by Minnesotans that were "outside the scope" of MPCA's analysis. Among these are the costs of building enough charging stations to accommodate the mandated EV sales from the ZEV rules, how much home charging stations would cost to install, and who would be responsible for paying them?

A model utility with two to three million customers would need to invest between \$1,700 and \$5,800 in grid upgrades per EV through 2030, according to Boston Consulting Group.<sup>30</sup>

Assuming 14,000 new EVs would be mandated on the Minnesota market each year, it would

require an additional investment of \$81.2 million per year, or \$812 million over the first 10 years of the mandates.

### **Rising Electricity Prices and Their Impact on EV Viability**

The Walz administration's assessment of costs or benefits also relies on the assumption that the price premium for electric vehicles will be only \$3,800 by 2025, and that EV fuel cost savings will total \$9,000 over the life of a vehicle. We believe this expected savings on fuel for electric cars will only be \$907 over the course of EVs lifetime.

EVs currently enjoy a price advantage on fuel relative to gas-powered cars. A Chevy Bolt can travel 238 miles on a single charge with its 60-kilowatt hour (kWh) battery. Using these numbers, it would take 0.25 kWh to drive one mile. In the City of Minneapolis, residential electricity prices are 16.11 cents after taxes and fees. This means the cost per mile is approximately 4 cents.

A 2020 Chevy Malibu has a fuel efficiency of 29 miles per gallon in town and 36 miles per gallon on the highway. If we assume an average fuel economy of 33 miles per gallon and a gasoline cost of 2.50 per gallon, the cost per mile is approximately 7.5 cents, meaning electric cars cost approximately 46 percent less to drive than ICEVs at this time.

However, the price difference between electricity and gasoline could easily diminish over time as residential electricity rates in Minnesota continue to increase. For example, Xcel Energy recently announced its desire to increase residential electricity prices by 20 percent to help pay for \$597 million dollars in capital expenditures and to make up for lost revenue due to lower electricity consumption due to energy efficiency (See Figure 8).<sup>31</sup>

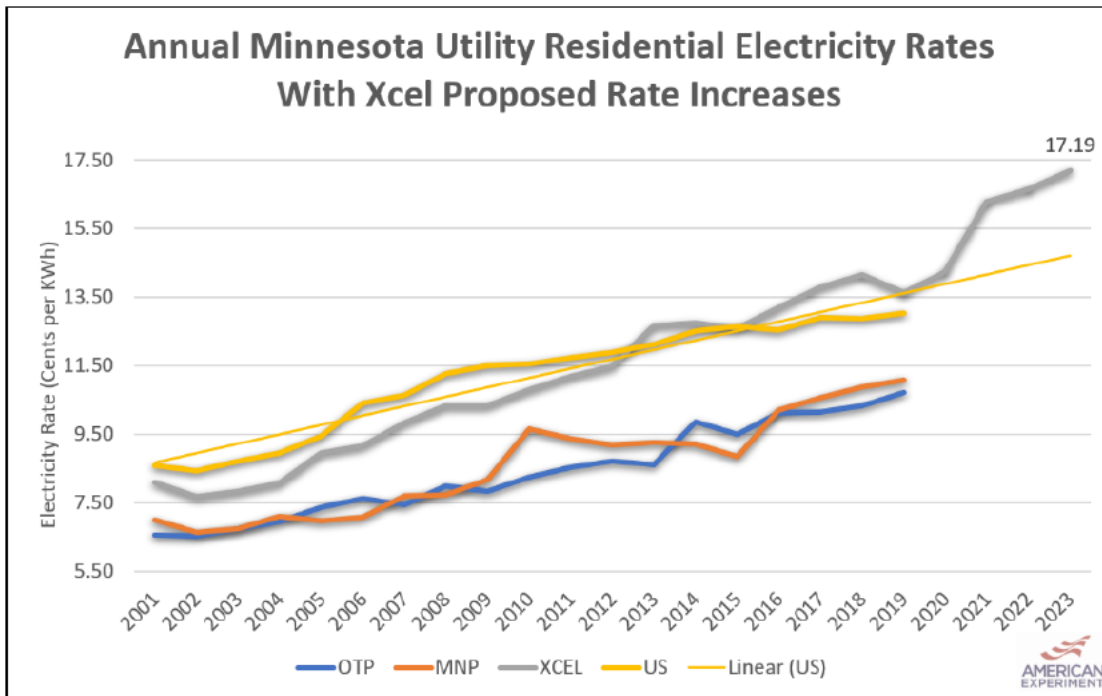


Figure 8. Minnesota electricity rates vary substantially by electricity provider. Residential rates for Xcel Energy customers will increase substantially if its proposed rate increases are enacted. OTP is Otter Tail Power Company, MNP is Minnesota Power, XCEL is Xcel Energy, and US is the average residential rate in the United States.

Xcel's proposed rate increase would raise residential electricity rates to 17.19 cents per kWh before taxes and fees, which grows to 18.98 cents per kWh after taxes and fees in Minneapolis. As a result, the cost per mile would grow to 4.75 cents for EVs and diminish the fuel cost advantage of electricity from 46 percent lower than gasoline to 36.6 percent lower.

As electricity becomes more expensive over time, the price advantage of electricity, relative to gasoline, diminishes, making these rules less reasonable.

Center of the American Experiment has evaluated Xcel Energy's proposed Integrated Resource Plan and estimated the plan will cost \$57 billion through 2051, and increase residential electricity rates to 24 cents per kilowatt-hour before taxes and fees, and 27.3 cents per kWh after taxes and fees are assessed.

Costs are driven by Xcel's proposed resource mix, which would close the remainder of their coal plants by 2030, and build up to 4,000 megawatts (MW) of wind, 3,500 MW of utility solar, 574 MW of community solar, 3,450 MW of natural gas (combines cycle and combustion turbine), and repower 3,499 MW of wind.<sup>32</sup>

Figure 9 shows residential electricity prices in Xcel Energy's service territory, assuming these costs are split among residential, commercial, and industrial ratepayers in accordance with historical trends. Electricity prices reach 27.3 cents per kilowatt-hour in 2034.

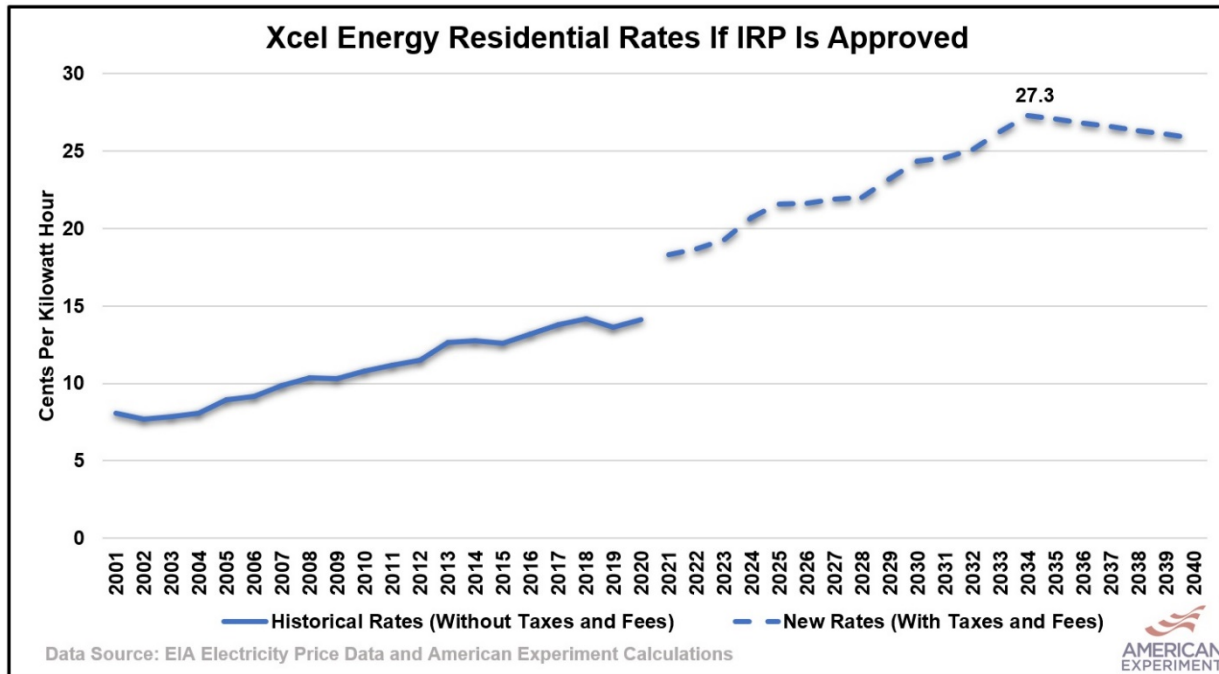


Figure 9. Electricity rates in Minnesota continue to climb, and the trend will continue through 2035. This will reduce the current price advantage of using electricity instead of gasoline.

When we consider the rising price of electricity in Xcel's service territory for fueling electric vehicles against the Annual Energy Outlooks 2019 reference case, which the MPCA used in its analysis, we see that the price advantage of electricity is quickly eroded for the years 2025 through 2034 (See Table 2).

Year	Miles Driven	Dollars/Gallon EIA 2019 Reference Case	Dollars Per Mile	Cost Per Year	Cents Per kWh	Dollars Per Mile	Cost Per Year
0	13414	\$ 3.15	\$ 0.063	\$ 844.07	0.2161	0.054	724.69135
1	13159	\$ 3.18	\$ 0.063	\$ 834.77	0.2164	0.054	711.9019
2	12884	\$ 3.24	\$ 0.065	\$ 834.14	0.2192	0.055	706.0432
3	12590	\$ 3.26	\$ 0.065	\$ 820.85	0.2203	0.055	693.39425
4	12280	\$ 3.34	\$ 0.067	\$ 820.19	0.2321	0.058	712.547
5	11955	\$ 3.36	\$ 0.067	\$ 801.80	0.2436	0.061	728.0595
6	11617	\$ 3.39	\$ 0.068	\$ 787.49	0.2456	0.061	713.2838
7	11269	\$ 3.42	\$ 0.068	\$ 770.25	0.2513	0.063	707.974925
8	10913	\$ 3.44	\$ 0.069	\$ 748.91	0.2624	0.066	715.8928
9	10550	\$ 3.46	\$ 0.069	\$ 729.19	0.2727	0.068	719.24625
10	10183	\$ 3.48	\$ 0.070	\$ 708.25	0.2709	0.068	689.643675
11	9815	\$ 3.51	\$ 0.070	\$ 688.22	0.2682	0.067	658.09575
<b>Total</b>				\$ 9,388.11			8480.7744
<b>Difference</b>							\$ 907.34

*Table 2. Using EPA's MOVES assumptions, the Energy Information Administration's Annual Energy Outlook's 2019 Reference case for gasoline prices, and American Experiment's analysis of future electric rates, we conclude the likely lifetime EV fuel savings will be around \$910.*

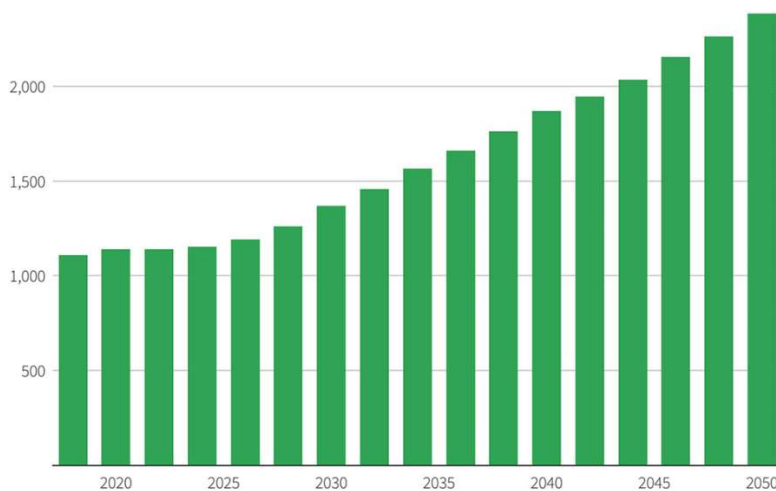
Using our electricity price forecast, the average EV driver would save almost \$910 over the course of the lifetime of the vehicle. We did not attempt to quantify savings from lower lifetime maintenance costs for EVs compared to ICEVs.

We have reason to believe our electricity price forecast is conservative. Xcel's proposed capacity additions may not be enough to meet rising electricity demand due to increasing numbers of electric vehicles, as the National Renewable Energy Laboratory estimates an installed electric generation capacity would need to be double by 2050, primarily to meet the demand for electricity if 66 percent of the vehicle fleet were operated on electricity. (See Figure 10).<sup>33</sup>



## Estimated U.S. capacity if 66% of all cars are EVs by 2050

Gigawatt electric capacity needs to double to power 186 million light-duty EVs in 2050



Note: Capacity in GW is rounded; 2018 is the base case, all other years estimated; data assumes the share of electricity also increases for space and water heating, industrial curing needs by 2050, but vehicle electrification dominates incremental demand growth  
Source: The National Renewable Energy Laboratory's Electrification Futures Study, Jan 2021

*Figure 10. Installed electric generating capacity would need to double by 2050 to accommodate a vehicle fleet that is 66 percent powered by EVs.*

Utilities will also be investing billions of dollars to accommodate electric vehicles. According to AutoBlog: "Investments in both the grid and charging infrastructure that are recovered from ratepayers could add between \$3 billion and \$10 billion in cumulative cash flow to the average utility through 2030, according to Boston Consulting Group."<sup>34</sup>

These capital expenditures will put significant upward pressure on electricity rates, further diminishing any operating cost advantages electric vehicles may currently enjoy. They may even make electricity more expensive than gasoline.

Rising electricity prices call into question the reasonableness of mandating the sale of EVs in Minnesota. There is also, as an aside, real concern about the future reliability of the electric grid as Minnesota's reliable, baseload electricity generators are retired in the next decade.

### **Electric Grid Reliability Concerns**

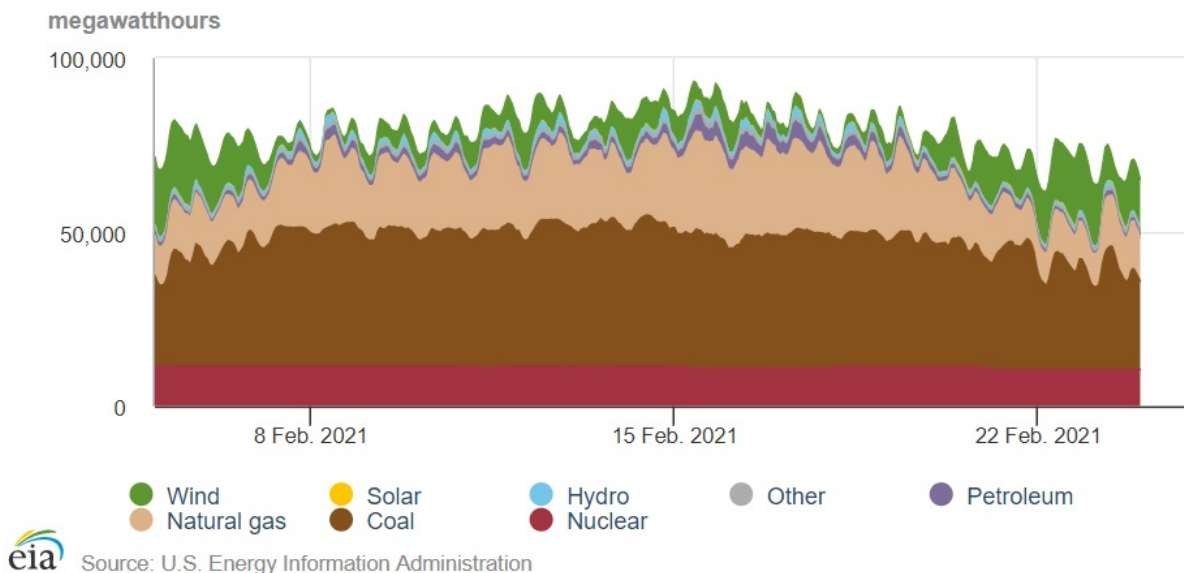
An increasing reliance on intermittent power sources like wind and solar power have resulted in rolling blackouts in California, Texas, and the 14 states of the Southwest Power Pool since August of 2020. NREL estimates the electricity generated to power increasing quantities of

electric vehicles will primarily come from wind, solar, and natural gas. The increasing reliance on these fuels puts Minnesota's energy system at risk.

The risk is growing because as Jesse Jenkins, a Dr. Jesse Jenkins, a professor at Princeton University and a rising star in the world of renewable energy, stated on Twitter, "Wind is reliably unreliable, and the system operators and everyone else knows that. So we plan around it. The real failure is to plan around the likelihood of simultaneous thermal plant outages. That's my point."<sup>35</sup>

Wind generation often plummets when severe cold weather fronts move through Minnesota. Data from the U.S. Energy Information Administration show the regional grid to which Minnesota belongs, the Midcontinent Independent Systems Operator (MISO), saw a dramatic drop off in wind generation during the Polar Vortex that occurred in mid-February (See Figure 11).<sup>36</sup>

#### Midcontinent Independent System Operator, Inc. (MISO) electricity generation by energy source 2/5/2021 – 2/24/2021, Central Time



*Figure 11. During the polar vortex of 2021, wind generation fell precipitously. Coal served the majority of electricity load during this time, with natural gas and nuclear also supply significant quantities of power.*

MISO was able to avert blackouts largely due to the performance of the coal fleet, which shouldered more than 50 percent of electricity load during the cold snap. Without the coal fleet,

falling generation from wind turbines would necessitate an enormous increase in generation from natural gas-fired power plants.

Figure 12 demonstrates what a hypothetical day would look like for Minnesota's electric grid during an extreme winter weather event with low wind speeds in 2035, after the state's final coal plants have been retired. Electricity generation responsibilities would fall on the state's nuclear and natural gas generators.

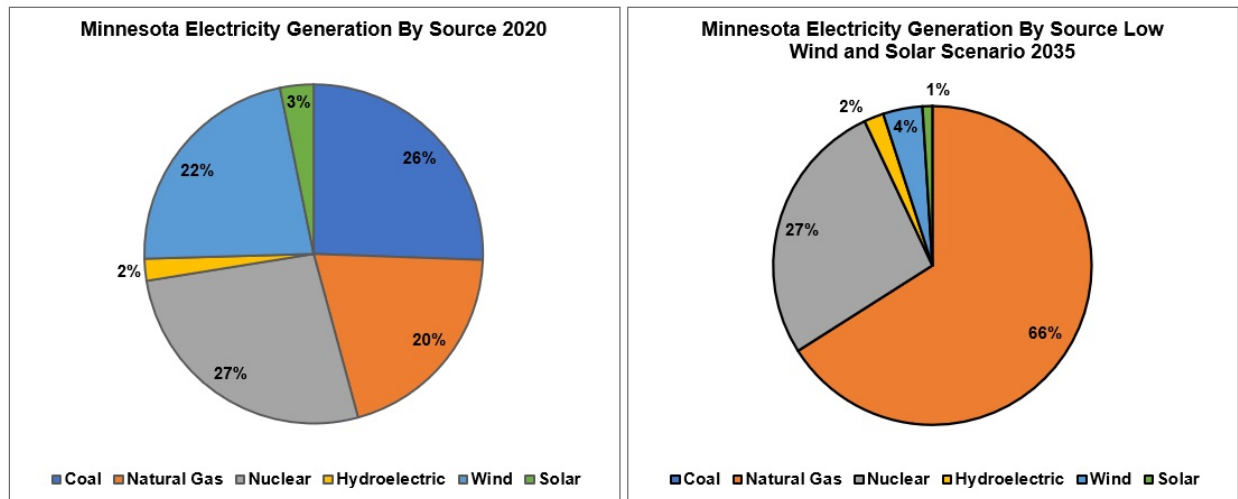


Figure 12. Minnesota currently has a diverse fuel supply, but the grid will become increasingly dependent upon natural gas when the wind isn't blowing or the sun isn't shining.

The overreliance on natural gas is problematic because 66 percent of Minnesotans heat their homes with natural gas, and these customers often have first priority for the fuel.

Electric generators would be competing for supplies with heating fuel, and we would be placing additional strain on the grid to charge electric vehicles and keep the lights on. This situation could easily result in the types of rolling blackouts experienced in Texas, where the state's reliance on wind and gas led to several days of electricity shortages.

Some groups will argue EVs could help prevent blackouts by feeding power back to the grid when it is needed, but we find these arguments to be unpersuasive. If there is competition for natural gas for home heating, normal electricity generation needs, and transportation during a week-long Polar Vortex, EV batterie will be unable to meet demand.

This presents an obvious safety hazard, as people may be unable to leave their homes to seek warmth or shelter because the electricity in their car batteries has been used to prop up the grid. The ZEV mandates will increase stress on an electric grid that is increasingly fragile.

## **7. Environmental Impacts of the Proposed LEV and ZEV Standards**

Center of the American Experiment believes MPCA may be overestimating the greenhouse gas emissions reductions from the rules. Furthermore, American Experiment believes the agency should be required to give the public estimate of how much future global warming may be averted by promulgating these regulations. Our own estimates suggest that adopting these rules will have no measurable impact on future global temperatures.

The estimated benefits these rules would deliver by reducing traditional air pollutants is also likely exaggerated because Minnesota already meets all federal air quality standards; backyard fires and home heating contribute a larger share of pollutants than transportation; and the Air Quality Index in Hennepin County during the COVID-19 shutdown in the spring of 2020 was worse than the previous five-year average despite a 40 percent reduction in traffic.

### **Overestimating Greenhouse Gas Emissions Reductions**

MPCA estimates these regulations will decrease greenhouse gas emissions from the transportation sector by 1.4 million tons through 2034. This estimate does not consider the emissions that occur from manufacturing battery electric vehicles or ICE vehicles.

We believe the rulemaking would benefit by incorporating this information because studies suggest it can take two to three years of operation for an EV to pay back its "carbon debt," and this will take longer on grids where the marginal fuel for electricity generation is coal, as it is in the Midcontinent Independent System Operator (MISO).

According to Carbon Brief, recent studies have shown wide variations in estimates for emissions for manufacturing lithium-ion batteries. These estimates can be as low as 40 kilograms of CO<sub>2</sub> equivalent per kilowatt-hour (kg/KWh) of battery capacity to 334 kg/KWh.<sup>37</sup> We believe MPCA should conduct an emission analysis using both low-end and high-end estimates for their emissions calculations.

Center of the American Experiment believes that EVs reduce GHG emissions relative to ICE engines in the long run, but because greenhouse gas emissions have a global effect, any emissions involved with manufacturing these vehicles should be quantified by MPCA even if the batteries and EVs are not manufactured in the state. This ensures the agency is properly accounting for greenhouse gas "leakage."

## **MPCA Should Publish Estimated Temperature Impacts of All Greenhouse Gas Regulations**

The Walz administration clearly indicated the primary reason for initiating the LEV and ZEV rulemaking was to reduce transportation-related carbon dioxide emissions, thus reducing the impact of the transportation sector on climate change.

However, MPCA has not clearly stated how much future global warming adopting these rules would avert.

American Experiment believes all future greenhouse gas regulations promulgated by MPCA should clearly and publicly describe the degree to which greenhouse gas emissions would be reduced (in tons) and the impact such regulations would have on global temperatures (in degrees C by 2100) before enacting new rules.

To conduct this analysis, American Experiment recommends MPCA use the Model for the Integration of Greenhouse Gas Induced Climate Change (MAGICC), which is the same model used by the Obama Administration when it modeled the impacts of the Clean Power Plan. We believe a variety of inputs for equilibrium climate sensitivity should be used, ranging from 1 to 4.5 degrees C for each doubling of CO<sub>2</sub> in the atmosphere.

We also believe the agency should be required to account for the likely growth in greenhouse gas emissions in developing countries would be most appropriate for distinguishing the impact these regulations will have on global temperatures and isolating these impacts from other emissions sources.

## **California Car Regulations Will Have No Measurable Impact on Global Temperatures**

MPCA has state these rules will avert 1.4 million tons of greenhouse gasses by 2034. Using the same logic used by the Obama administration in developing the Clean Power Plan, which was widely considered to be the previous administration's most sweeping climate change initiative, American Experiment has estimated the temperature impact of the LEV and ZEV mandates on future global temperatures.

Had it not been stayed by the Supreme Court, the Clean Power Plan would have averted 730 million tons of carbon dioxide emissions from the electric power sector annually, which would have averted 0.019 degrees C by 2100, according to the Obama administration's own climate models. This is an amount too small to accurately measure with even the most sophisticated scientific equipment.

The regulations proposed by Governor Walz would avert 1.4 million tons of carbon dioxide annually or 1.27 million metric tons. This means the LEV and ZEV mandates would avert approximately 0.17 percent of the anticipated reductions from the Clean Power Plan.

We can then estimate the temperature impact of the regulation by multiplying 0.019 degrees C by 0.17 percent, which gives us a temperature reduction of 0.000033 degrees C by 2100, an amount far too small to measure.

When announcing the LEV and ZEV regulations, Governor Walz stated the regulations would help "make sure there was still ice on the lake in January," but the administration has offered no credible proof that these regulations would have any measurable impact on Minnesota's climate or ice cover on Minnesota lakes.

### **Questions MPCA should answer before issuing rules:**

MPCA claims "In monetary terms, the total GHG reductions achieved by the proposed rule would lead to about \$500 million (in 2018 dollars) in avoided climate damages." What is the timescale the agency is assuming the for the avoided damages? By 2100? Which year, specifically?

What impact will carbon dioxide emissions reductions have on global temperatures?

### **No Impact on Traditional Pollutants**

California car mandates are unlikely to produce any measurable environmental or health benefits because emissions of criteria pollutants from American cars have fallen dramatically in the last four decades.

According to the U.S. Environmental Protection Agency, new passenger vehicles are 98-99 percent cleaner for most tailpipe pollutants compared to the 1960s.<sup>38</sup> Technologies have created more efficient engines, and catalytic converters have greatly reduced tailpipe emissions from cars. Furthermore, fuels are much cleaner—lead has been eliminated, and sulfur levels are more than 90 percent lower than they were prior to regulation.

Falling tailpipe emissions are one reason Minnesota has some of the cleanest air in the world. Our air quality easily meets all federal health-based National Ambient Air Quality standards. MPCA data show that neighborhood sources, such as backyard fires, home heating, and dry cleaners, contribute a larger portion of traditional pollutants than on-road vehicles.

MPCA's own analysis shows the California LEV and ZEV mandates will have virtually no impact on the levels of traditional pollutants in Minnesota. In fact, MPCA's addendum to the statement of need and reasonableness (SONAR) document show the agency originally overestimated the impact the rules would have on traditional air pollutants by a factor of ten.

Furthermore, and U.S. Environmental Protection Agency (EPA) air quality data show the Air Quality Index (AQI) was worse during the shutdown of the economy to stem the spread of COVID-19 in March of 2020 than the previous five-year average even though traffic volumes were down 40 percent. Lastly, a growing body of research indicates that indoor air quality is worse than outdoor air quality.

## Minnesota's Air Is Already Clean

We believe the marginal utility of these regulations will be low because, according to the MPCA graph below, our air already meets the most stringent state and federal standards for air quality.

The National Ambient Air Quality Standards are required by law to be set with an adequate margin of safety which is designed to protect even vulnerable populations like children and the elderly.<sup>39,40</sup>

Pollution from sulfur dioxide, carbon monoxide, and nitrogen dioxide are especially low compared to established benchmarks (See Figure 13).

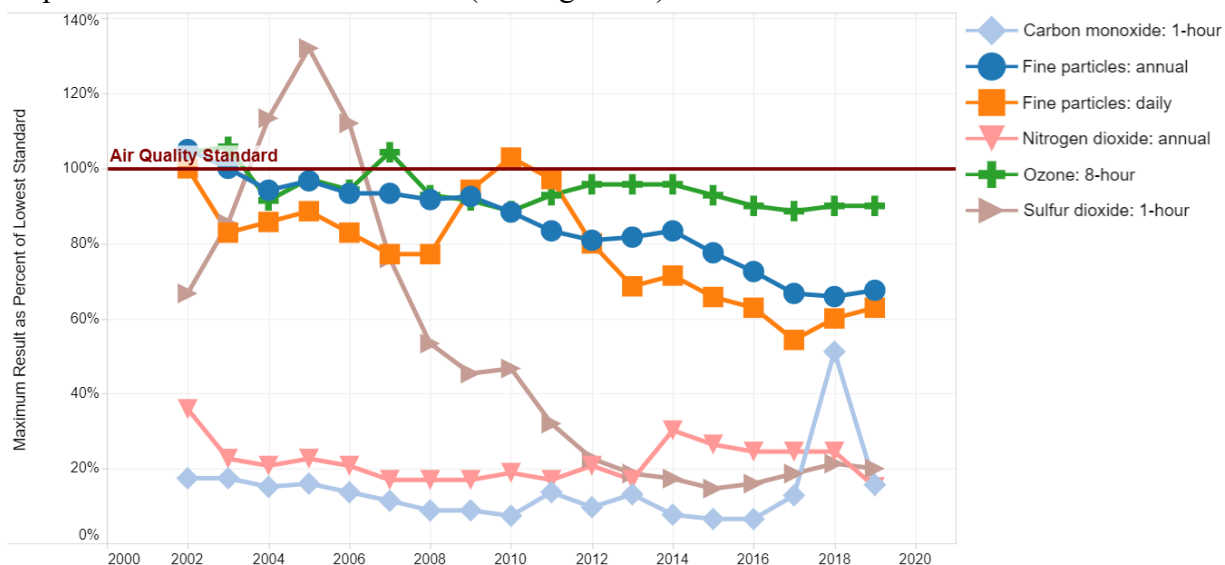
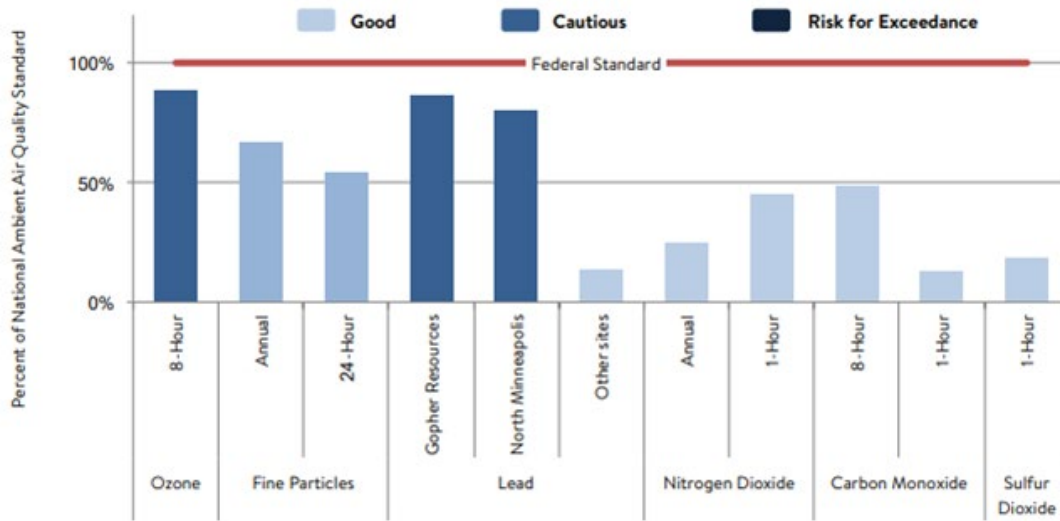


Figure 13. MPCA data show pollutants are below the most stringent air quality standards established by state and federal agencies.

Annual air quality reports from MPCA corroborate this data. The 2019 edition of "The Air We Breathe" concluded that Minnesota's air quality meets all federal standards and pollution levels are decreasing statewide (See Figure 14).<sup>41</sup>

## Minnesota's air quality compared to the National Ambient Air Quality Standards (2017)



This chart compares state air monitoring results to the federal standards (each represented by a column). Some pollutants have federal standards for both long-term and short-term averaging times (annual, 1-hour, etc.) to protect against both long-term and short-term health effects. The percentage shown describes Minnesota's maximum pollutant concentration as a percentage of the national standard. Values less than or equal to 100% meet the applicable standard. Note that in the case of lead, two facility-specific monitors are included. Both of these sites experience localized lead levels significantly higher than the rest of the state (see "facility-specific lead emissions" on next page).

Figure 14. MPCA data show air quality for Minnesota is below federal standards. Even areas with elevated concentrations of some pollutants are below these guidelines.

Particularly noteworthy was MPCA's finding that there were zero "bad air" days in 2017, and in 2018, seven of the nine "bad air" days were caused by smoke from distant wildfires that was transported into Minnesota.

Among emissions sources in Minnesota, MPCA data show neighborhood sources, such as dry cleaners, home heating, backyard fires, etc., are the largest contributors of criteria air pollutants in the state, whereas emissions from vehicles are much lower in comparison (See Figure 15).





Figure 15. Minnesota's air quality is far below federal limits for most measured emissions. Of these emissions, on-road vehicles constitute 24 percent of the total, which is 31 percent less than those emitted by neighborhood sources.

Center of the American Experiment believes Minnesota has made tremendous progress on improving its outdoor air quality, and this progress should be widely celebrated. Furthermore, MPCAs own SONAR data show the regulations would have no impact on air quality in the state.

### MPCA Data Shows Virtually No Change

MPCA's addendum to the SONAR show the original estimates for particulate matter reduction were an order of magnitude too high. The agency now states the rules will avert approximately 0.0125 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) of particulate matter measuring 2.5 micrometers in diameter, referred to as PM2.5, on a statewide average, and 0.03  $\mu\text{g}/\text{m}^3$  in BIPOC areas (See Figure 16).

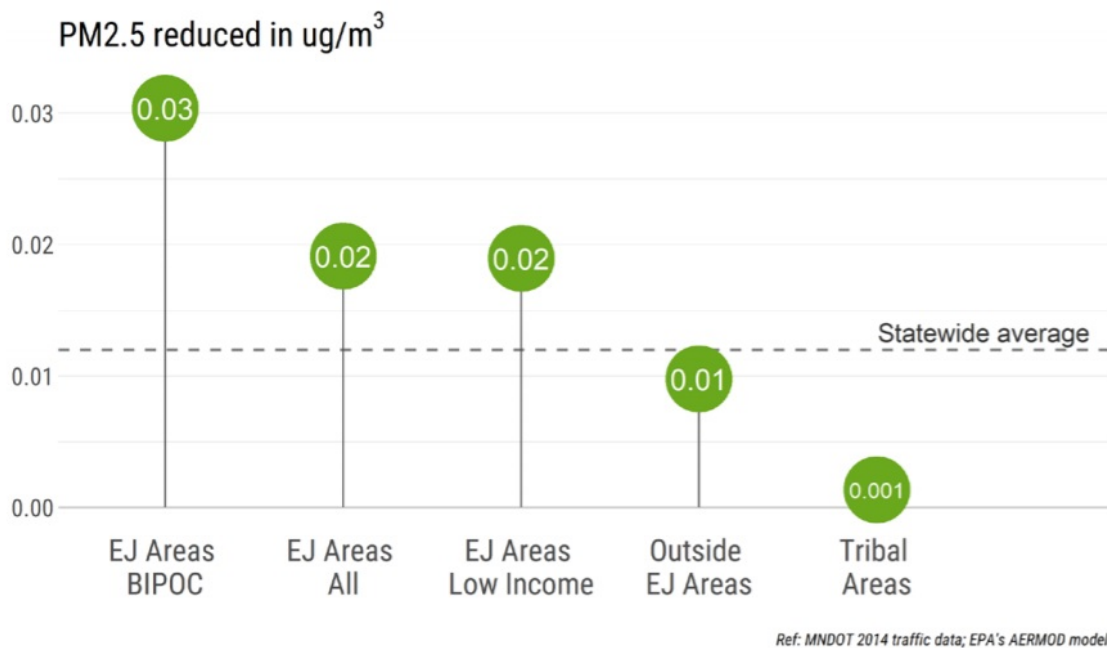


Figure 16. Reductions in PM2.5 will be a small fraction of the health-based standards established by the US EPA to protect vulnerable populations.

These values represent 0.1 percent, and 0.25 percent of the federal health-based standard of 12  $\mu\text{g}/\text{m}^3$ , respectively. The difference between the air quality in several Minnesota counties before the regulations would be implemented and after their implementation are shown in Figure 17.

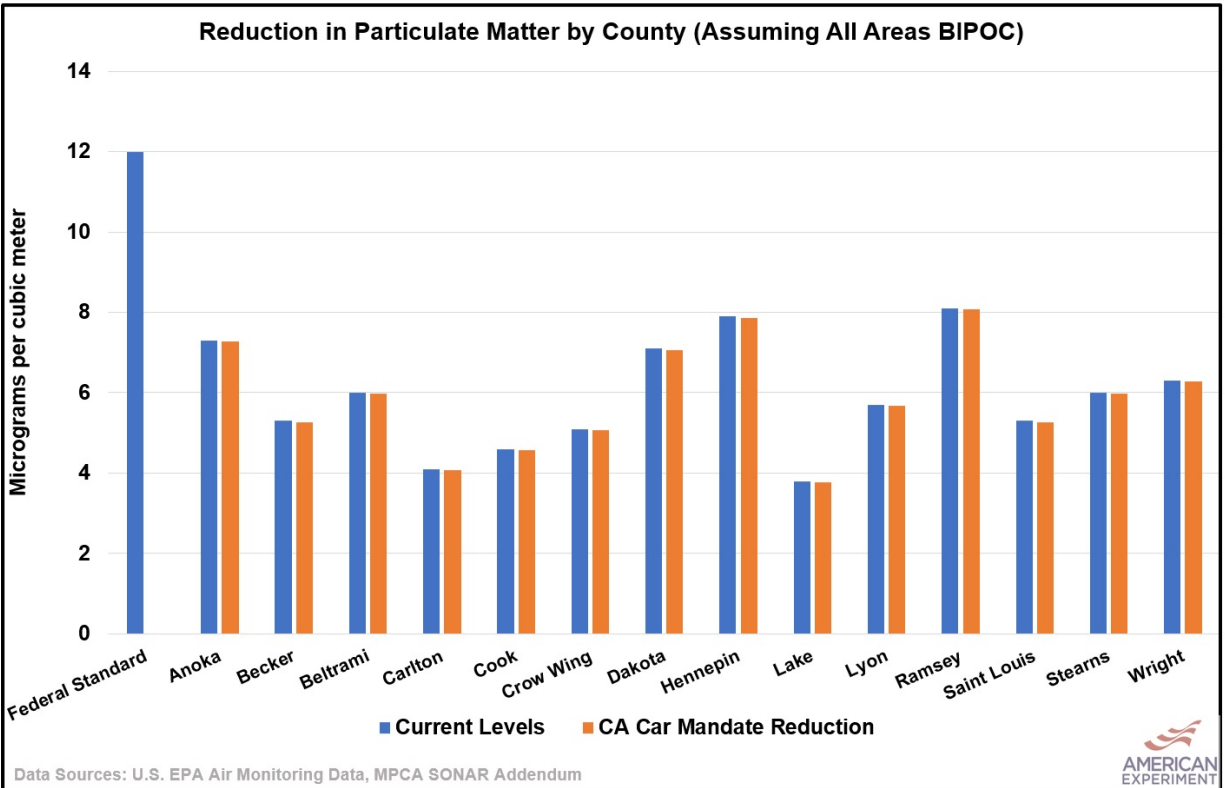


Figure 17. EPA air monitoring data show all of the Minnesota counties listed above have air quality that is at least 4 µg/m<sup>3</sup> lower than the health-based standard. This figure assumes all counties will see an improvement of 0.03 µg/m<sup>3</sup>, the largest reduction estimated by MPCA.

The ALJ should note that each of the Minnesota counties listed in the chart have PM<sub>2.5</sub> concentrations that are at least 4 µg/m<sup>3</sup> lower than EPA's health-based standards. This means the average statewide reductions in PM<sub>2.5</sub> concentrations would be 320 times smaller than the current "buffer" between PM<sub>2.5</sub> concentrations and the health-based standards.

### Health Benefits of Reducing 0.01 µg/m<sup>3</sup>

Exhibit O, Table 48 of MPCA's SONAR Addendum asserts that the marginal value of these reductions is worth \$161 million - **\$289 billion** in health benefits over the first ten years of implementation (based on a 7 percent discount rate).

We believe MPCA has incorrectly written "billion" instead of "million" because the agency's new estimate for health benefits is 229 times larger than the previous estimate, which was based on PM<sub>2.5</sub> concentrations being an order of magnitude larger than the updated SONAR values.

Even if we assume the savings will range from \$161 million to \$289 million, the health savings estimated by MPCA are likely overstated because MPCA is incorrectly (non-scientifically) assuming a linear threshold impact from PM exposure.

Using this logic, could we reasonably assume the benefits of being 4  $\mu\text{g}/\text{m}^3$  below the current health-based standard is worth \$51 billion to \$92.5 billion in health benefits? Could we assume that eliminating the remaining  $\sim 8 \text{ ug}/\text{m}^3$  would generate (up to) an additional \$185 billion in benefits to Minnesota, on top of the \$92 billion they have already received, for a total of \$277 billion?

We argue such a calculation would be absurd, especially when we consider the gross state product for Minnesota was \$383 billion in 2019.<sup>42</sup>

The justification for these rules is further diminished by the fact that air quality data from the U.S. EPA shows the Air Quality Index in Minnesota was worse during the COVID-19 shutdowns of 2020, even though state data show there were far fewer vehicles were on our roads.

### **Worse Air Quality During the COVID-19 Shutdown Despite Less Traffic**

In some heavily polluted parts of the world like China and India, the economic shutdowns that resulted from attempts to slow the spread of the COVID-19 virus resulted in cleaner air. However, in Minnesota, the air was actually less clean during Gov. Walz's shutdown than the previous five-year average.

According to data from the U.S. Environmental Protection Agency (EPA) and the Minnesota Department of Transportation (MNDOT) air quality was worse in Hennepin County during the COVID-19 shutdown even though traffic volumes were down around 40 percent.<sup>43,44</sup>

The first graph shows air quality data from EPA's Air Quality Index in Hennepin County from March 16, 2020 through June 10, 2020. The data show air quality was worse during Governor Walz's shutdown than it was during the previous five-year average. Despite the AQI being higher than the previous five-year average, air quality in Hennepin County was still far below levels that are considered hazardous (See Figure 18).<sup>45</sup>

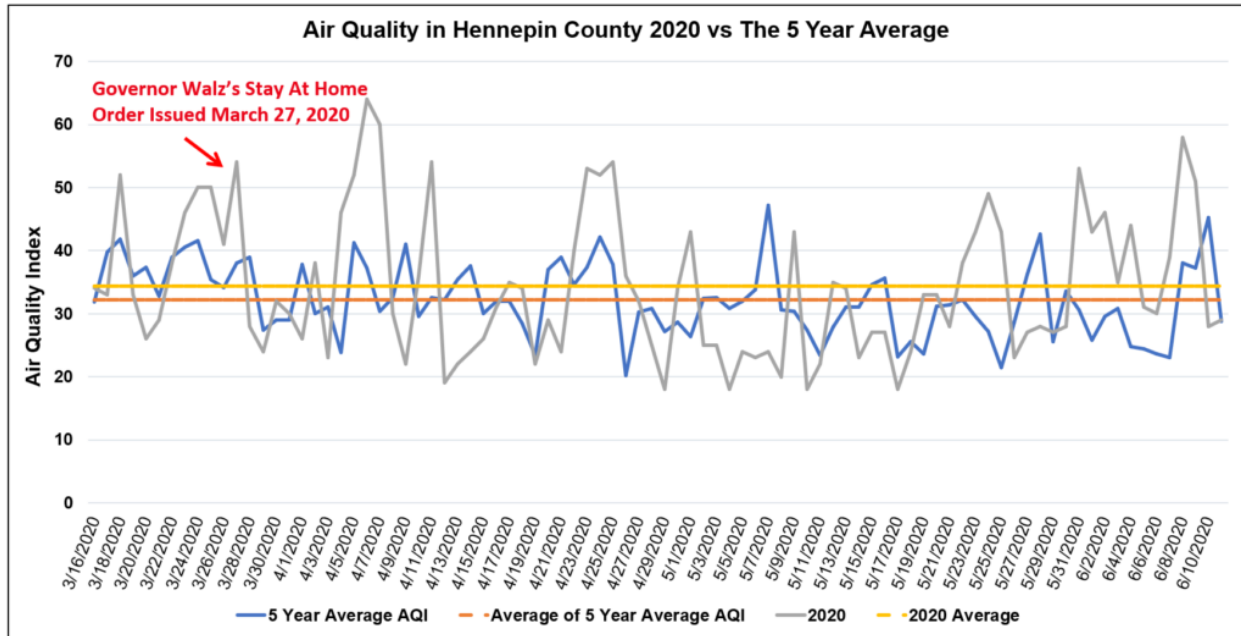


Figure 18. Air quality was slightly worse in April-June of 2020 even though far fewer vehicles were on Minnesota roads.

The AQI for 2020, as shown in the gray line, shows upticks in pollution even though traffic was down by about 40 percent during this time, as shown in Figure 19.

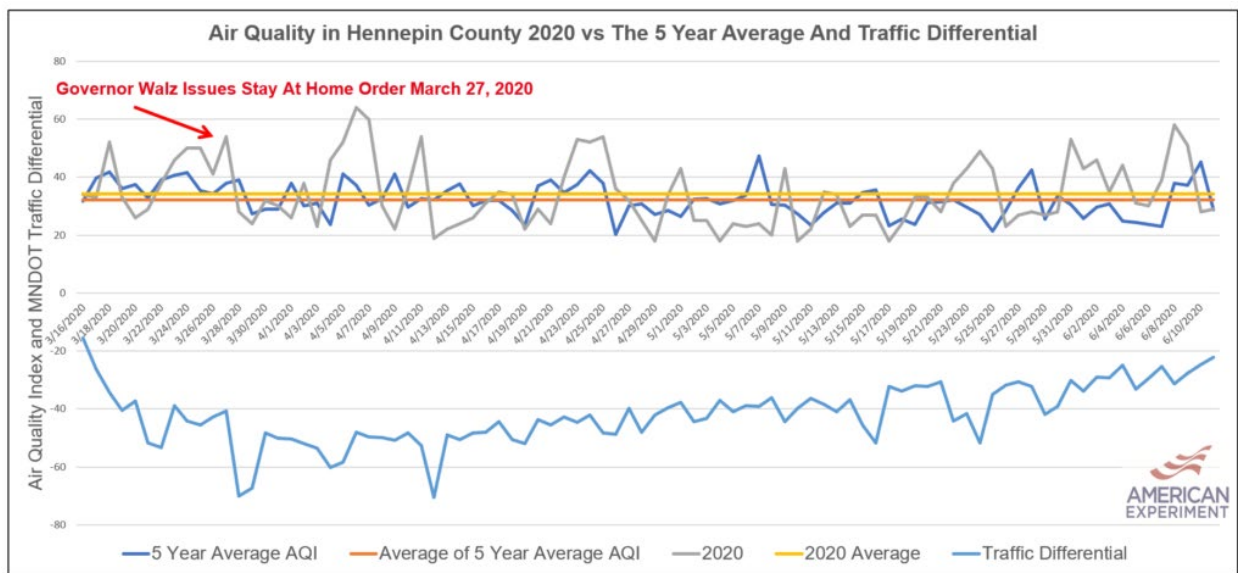


Figure 19. The AQI registered higher pollution levels even though traffic was down 40 percent.

The COVID shutdowns of 2020 provide an important natural experiment on the impact of human behavior on air quality and the limitations of further environmental regulations to improve it.

If reducing traffic volumes in the Twin Cities area by an average of 40 percent cannot show clear evidence of improvements in air quality, then there is no credible way that MPCA can argue the LEV and ZEV regulations will produce any reductions in future criteria pollution levels, or credibly claim the regulations will prevent hospitalizations, premature death, or lost GDP due to air emissions.

We therefore ask the administrative law judge to disallow MPCA's calculated benefits from reduced NOx, Sox, and PM from their cost-benefit analysis.

### **MPCA Should Measure, Not Model, Impacts for Vulnerable Communities**

MPCA's assertion that the California car mandates will improve air quality most in environmental justice areas where Black, Indigenous, People of Color (BIPOC) live is based on modeling, not measurements. We believe the agency's modeling should be supplemented by air sampling in BIPOC communities to ascertain whether the models are accurately reflecting reality.

Air quality models are wonderful tools that can help scientists see what might happen under a variety of different emissions scenarios and ask interesting questions about how public policy might affect pollution levels, but they are not a substitute for accumulating actual real-world data.

Before imposing expensive regulations on the entire state of Minnesota, MPCA should be required to conduct air quality sampling in accordance with EPA guidelines in vulnerable communities. Such air sampling will provide the agency with the crucial data needed to verify whether its modeling assumptions are correct.

It is important to note that MPCAs rules could unintentionally make air quality worse in BIPOC neighborhoods if its air sampling program does find that these areas to indeed suffer from worse air quality.

The oldest cars on the road emit the most pollutants. By increasing the price of new vehicles, MPCA could be dissuading drivers from purchasing new cars. This could restrict the supply of used vehicles or incentivize repairing, rather than replacing, the oldest models on the road, delaying improvements in air quality.

### **Indoor Air Quality is Worse than Outdoor Air Quality**

The U.S. Environmental Protection Agency states that in the last several years, a growing body of scientific evidence has indicated that the air within homes and other buildings can be more seriously polluted than the outdoor air in even the largest and most industrialized cities.<sup>46</sup>

According to EPA, levels of indoor air pollutants are often two to five times higher than outdoor levels, and in some cases, these levels can exceed 100 times that of outdoor levels of the same pollutants.<sup>47</sup>

Other research indicates that people spend approximately 90 percent of their time indoors. Thus, for many people, the risks to health may be greater due to exposure to air pollution indoors than outdoors.<sup>48</sup>

In addition, people who may be exposed to indoor air pollutants for the longest periods of time are often those most susceptible to the effects of indoor air pollution. Such groups include the young, the elderly, and the chronically ill, especially those suffering from respiratory or cardiovascular disease.<sup>49</sup> Conversely, these groups are also the least likely to be affected by outdoor air quality conditions due to spending the majority of their time indoors.

Interestingly, EPA states "If too little outdoor air enters a home, pollutants can accumulate to levels that can pose health and comfort problems. Unless they are built with special mechanical means of ventilation, homes that are designed and constructed to minimize the amount of outdoor air that can "leak" into and out of the home may have higher pollutant levels than other homes."

Imposing additional LEV and ZEV regulations on the automotive industry will increase costs for consumers but will do little to address the most pressing air quality challenges facing demographics MPCA considers to be among the most vulnerable in the state.

## **Air Quality Modeling**

The U.S. EPA has provided considerable evidence suggesting that indoor air quality is now worse than outdoor air quality. This new pollution paradigm requires that MPCA reconsider its MNRISKS air modeling practices and how it assesses the economic impacts of cumulative air pollution.

For example, the agency writes:

"Having good air quality means fewer missed work and school days and less money spent on air pollution-related illness. The MPCA estimates the overall economic impact of health effects related to air pollution in Minnesota exceeds \$30 billion per year."

According to MPCA source documents, the MNRISK model uses risk assessment methods to examine hypothetical individuals that spend their whole life in one community, breathing only that air. Modeled emissions include all air pollution sources in the state of Minnesota, including vehicles, factories, construction equipment, building boilers, residential wood burning, etc.<sup>50</sup>

MNRISKS may be suitable for assessing "worst case scenario" impacts, but because they assume people spend an entire lifetime breathing air in the same neighborhood, the assumptions used in the model do not reflect real-world exposure risks.

Therefore, we believe MPCA should be required to conduct modeling that attempts to more closely reflect the actual exposure Minnesotans have to pollutants in order to better assess what the health impacts of proposed regulations may be. American Experiment also believes MPCA should improve its risk assessment by using non-linear biphasic dose-response models, including adaptive and dynamic non-linear models (beyond classic threshold models) to enhance the quality of regulatory decisions and the protection of ecological health that were supported by Agathokleous et. Al, in the journal *Environmental Pollution*.<sup>51</sup>

In summary, MPCA should make it clear that the premature death and hospitalization figures estimated by MNRISKS likely represent high-end risk scenarios and do not reflect actual values for hospitalizations, premature death, or lost GDP due to air emissions. Furthermore, future regulatory decisions can be improved by using non-linear biphasic dose-response models rather than linear no-threshold modeling.

## **8. Disparate Impacts on Minority and Low-Income Communities**

There is great merit in investigating the impact the proposed regulations will have on communities of color and low-income communities, including rural communities in Greater Minnesota.

As such, it is vitally important that MPCA understands that a group of nationally renowned civil rights activists are currently suing CARB because their regulations on greenhouse gas emissions are having disparate negative impacts on low-income and minority neighborhoods.<sup>52</sup>

The group, known as The Two Hundred, alleges CARB's greenhouse gas emissions regulations are "staggering, unlawful and racist," and contributing to "resegregation," according to an article in *Forbes*.<sup>53</sup>

*"Top civil rights leaders are suing California for climate policies they say disproportionately harm its poorest residents, particularly Latinos and African Americans.*

*"California politicians are using anti-racist and environmentalist words to hide the regressive impact of their climate policies on the poor and people of color," said John Gamboa, the co-founder of The Two Hundred, a coalition of prominent civil rights leaders, which filed a lawsuit against the California Air Resources Board (CARB) in Superior Court.*

*The suit claims CARB is in violation of the Fair Employment and Housing Act, the California Global Warming and Solutions Act, the California Clean Air Act, and other federal and state laws.*

*"California's climate policies guarantee that housing, transportation and electricity prices will continue to rise," the complaint notes, "while 'gateway' jobs to the middle class for those without college degrees, such as manufacturing and logistics, will continue to locate in other states."*

The concerns voiced by the Two Hundred regarding the negative impact of CARB's policies on disadvantaged communities will likely occur in Minnesota because the Walz administration is adopting identical policies.

The proposed regulations affecting Minnesotans would be drafted by CARB, the agency being sued by The Two Hundred. Because the Clean Air Act (CAA) requires states wishing to adopt California's standards to do so exactly, Minnesota has no flexibility within the rules to adopt Minnesota-specific changes that may help mitigate the negative impacts CARB's policies are inflicting on Latino and African American communities in California.

Secondly, as stated in previous sections, auto-dealers in Colorado have estimated these regulations would increase the cost of vehicles by \$2,000 to \$2,500 per vehicle. Such price increases would disproportionately harm low-income families, as George Lefcoe, a professor of law at the University of Southern California stated in *Forbes*:

*"Lefcoe, who is not involved in the case, said the lawsuit's challenge to transportation policies is particularly powerful. "Automobiles are the survival mechanism for low-income people," noted Lefcoe. "If you try to increase the cost of automobiles, you hurt low-income people."*

Regardless of intent, rising automobile prices will harm low-income people the most.

LEV and ZEV rules are problematic because the benefits of these new, lower-emitting vehicles would disproportionately accrue in affluent, majority-Caucasian neighborhoods.

Data from the federal Energy Information Administration show 67 percent of EVs purchased in the United States were bought by households earning more than \$100,000 per year.<sup>54</sup> Only three percent of households earning less than \$25,000 owned an electric vehicle, and fewer than five percent of households earning between \$25,000 and \$50,000 owned an EV (See Figure 20).



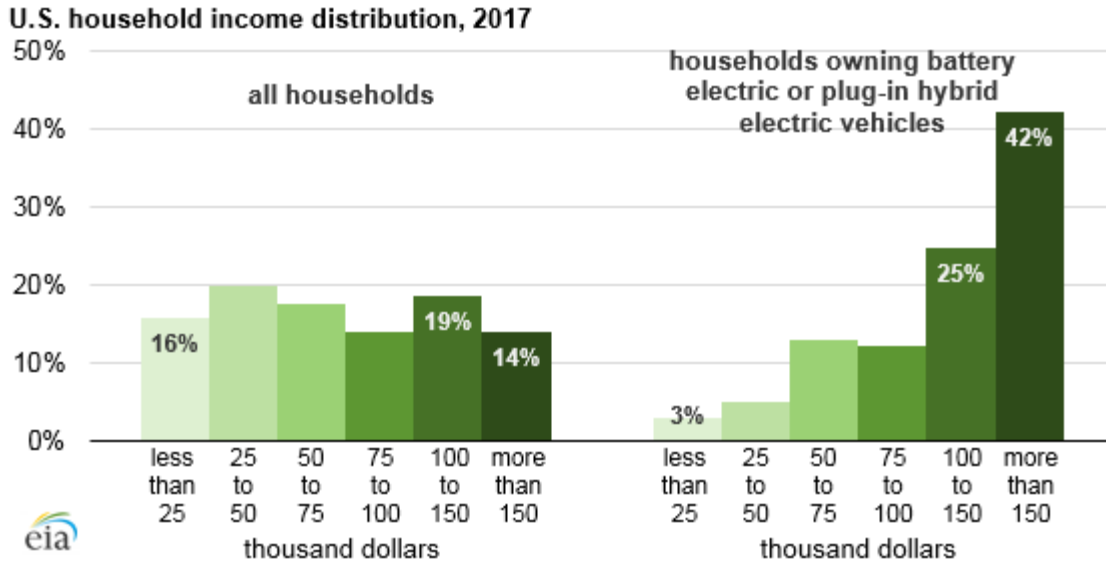


Figure 20<sup>1</sup>. EV ownership is highest among demographics earning more than \$100,000 per year.

Additionally, research conducted by professors at Morgan State University studying the socio-demographic attributes of EV owners concluded that 85 percent of EV owners are white, and that “EV owners are white males who are more educated, affluent, older, and more environmentally focused than are owners of internal combustion engine vehicles.<sup>55</sup> EVs were most popular among Democrats and least among those not interested in politics.”

The proposed LEV and ZEV regulations will make ICEVs more expensive, and the long payback period for these more fuel-efficient cars could incentivize car buyers to keep their cars longer than they normally would if new cars were less expensive. This could have an unintended effect of shrinking the secondary car market and raising prices for low-income households who have fewer resources available to commit to purchasing a new-to-them vehicle.

It is difficult to see how these proposed regulations will have a positive impact on minority or low-income communities. Access to affordable private transportation is a crucial part of empowering these demographics to seize economic opportunities wherever they may arise. Artificially inflating the cost of getting to work or school will have demonstrable, negative impacts for these communities. The vast majority of environmental benefits would accrue in affluent, mostly-white areas.

## **9. There is no legal basis to implement LEV and ZEV rules under Minnesota Law**

Section 177 of the Federal Clean Air Act allows other states to adopt California's more stringent auto emissions standards, but the Legislature has not granted statutory authority to MPCA to enact these rules, which are legally required. In fact, the Legislature specifically decided not to pass such legislation at least twice, in 2007 and 2008. Moreover, the Federal EPA has withdrawn the rule authorizing the adoption of the California standards, effective November 18, 2019.

Gov. Walz and MPCA have cited the Next Generation Energy Act (NGEA), Minnesota statute 216H.02, subd. 1, which establishes a statewide goal "to reduce statewide greenhouse gas emissions across all sectors producing those emissions to a level at least 15 percent below 2005 levels by 2015, to a level at least 30 percent below 2005 levels by 2025, and to a level at least 80 percent below 2005 levels by 2050," as justification for the rules, but these are non-binding goals. They are not requirements and no rulemaking authority is granted in that Act.

For these reasons, and in the reasons provided in CAE's other comments through counsel, it is likely that the proposed rules, if enacted, would not withstand a legal challenge.

## **10. Conclusions**

Adopting LEV and ZEV regulations promulgated by CARB will have measurable, negative economic impacts for the state of Minnesota, and will make driving less accessible for many low-income Minnesotans and reduce passenger safety. While the negative economic and public health impacts are tangible, the environmental and public health benefits of this rule are immeasurably small.

Increasing the cost of vehicles has an outsized negative impact on minority and low-income communities because LEV and ZEV ownership will skew toward predominantly wealthy and white areas. This could lead to the gap in environmental quality growing between neighborhoods, even if overall air quality improves.

For all of the foregoing reasons, Center of the American Experiment respectfully requests that the ALJ find the LEV and ZEV regulations proposed by the Walz administration and MPCA be unneeded and unreasonable.

Respectfully submitted,

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