Subject: Public Hearing Comments
Date: Tuesday, April 25, 2023 at 4:16:56 PM Eastern Daylight Time
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To: HearingComments, DNREC (MailBox Resources), tjwaeghe@comcast.net
Attachments: 42523 Electirc Vehicle Mandate Comments Thomas J Waeghe.pdf

Comments on 2022-R-A-0011: Low Emission Vehicle Program

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Comments:
Please see my uploaded file. I am against ANY MANDATE for purchase or sale of electric vehicles. Let capitalism, competition and incentives for business creativity and ingenuity find alternatives so that we can be energy-independent, and save petroleum products for other purposes such as chemical manufacture, usage for situations where we still can only use petroleum products (roads, diesel fuel, heating oil, jet fuel, etc.).

Say NO to an Electric Vehicle Mandate in the State of Delaware

Reasons Why an Electric Vehicle Mandate is Not Needed or Wanted

1. Fundamentally, it would mean a loss of freedom and is NOT CONSISTENT with free-market principles and capitalism
2. Reducing air pollution is not necessary
   A. Air quality has improved steadily from the 1980s, to the 1990s, to the 2000s, to the 2010s and to the present.
      I. Biological volatile organic hydrocarbons from trees and plants contribute significantly to ground-based ozone in addition to VOCs from vehicle exhaust (unburned hydrocarbons from fuel).
3. Reducing levels of carbon dioxide (CO2) is NOT NECESSARY, and it's NOT DESIRABLE.

Mandate is NOT CONSISTENT with freedom and free market capitalism

- Our Founding Fathers believed in individual freedom and believed that government (aka guvmint) existed primarily to protect individual's rights of life, liberty, and property (later changed to the pursuit of happiness in the Declaration of Independence)
- A mandate to force auto manufacturers, and indirectly, auto buyers to buy first 35% and later 100% electric vehicles is FORCING individuals to sell and buy something.
  - **This is completely un-American and a loss of freedom of choice, which is a God-given right like all of our rights.**
  - **Our individual rights must be protected up to the point where they might infringe on the rights of others.**

Reducing Air Pollution Drastically is Not So Necessary That it Requires Electric-Only Vehicles

1. **Air quality has improved steadily from the 1980s, to the 1990s, to the 2000s, to the 2010s and to the present.**
   - **Carbon Monoxide (CO): 75% LOWER v. 1980**
   - **Nitrogen Oxides (NO_x) 72% LOWER v. 1980**
   - **Volatile Organic Compounds (VOCs): 61% LOWER v. 1980**
   - **Sulfur Dioxide (SO_2): 93% LOWER v. 1980**
   - **Particulates, sub-10-micron: LOWER BY 33% to 40% since 1990**
   - **Lead: 99% LOWER v. 1980**
2. **Air pollution will continue to improve as more cars with catalytic converters and computer controlled engines become more common**
   - **Biological volatile organic hydrocarbons from trees and plants contribute significantly to ground-based ozone in addition to VOCs from vehicle exhaust (unburned hydrocarbons from fuel).**

Percent Change in Emissions

	1980 vs 2021	1990 vs 2021	2000 vs 2021	2010 vs 2021
Carbon Monoxide	-75	-70	-57	-29
Lead*	-99	-87	-76	-30
Nitrogen Oxides (NO_x)	-72	-70	-66	-48
Volatile Organic Compounds (VOC)	-61	-49	-30	-21
Direct PM_{10}	-65	-33	-30	-22
Direct $PM_{2.5}$	---	-40	-46	-25
Sulfur Dioxide	-93	-92	-89	-76

*As a result of the permanent phase-out of leaded gasoline, controls on emissions of lead compounds through EPA's air toxics program, and other national and state regulations, airborne lead concentrations in the U.S. decreased 98 percent between 1980 and 2005. After 2005, the EPA methodology for lead changed and is not comparable to the 2005 and earlier numbers. Since 2008, emissions have continued to decrease by 30 percent from 2008 to 2017. In the 2017 NEI, the highest amounts of Pb emissions are from Piston Engine Aircrafts, and Ferrous and Non-ferrous Metals industrial sources. The 2008 and 2017 estimates were used to approximate the 2010 to 2021 percent change.

https://www.epa.gov/air-trends/air-quality-national-summary

Precursors to Ground Level Ozone all are down; Bio VOCs most prevalent

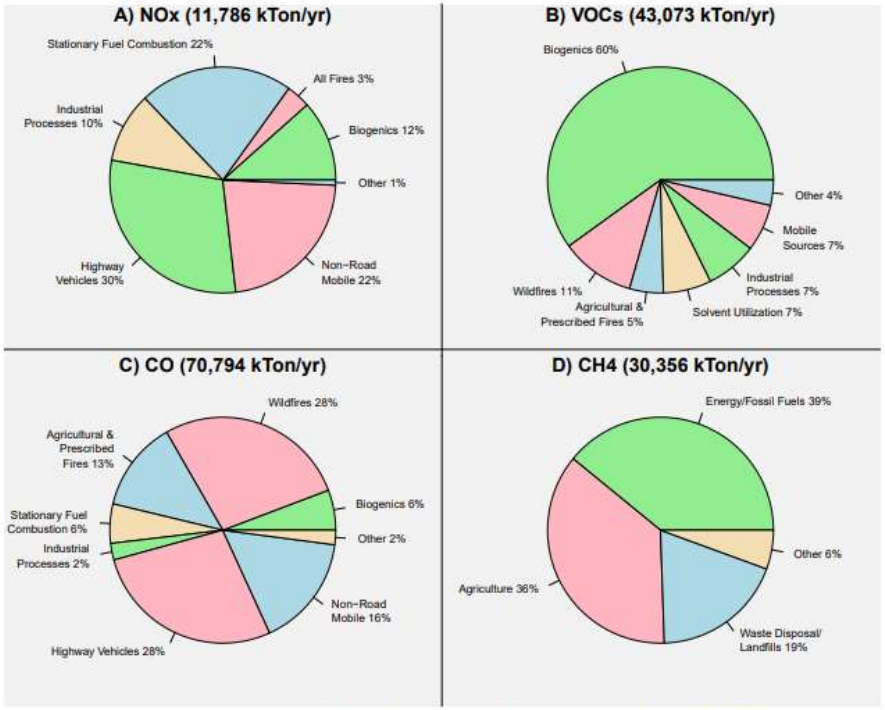


Figure 1. U.S. O_3 precursor emissions by sector: A) NO_X; B) CO; C) VOCs; D) CH_4. **Source:** 2017 NEI for panels A)-C), Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2020 for panel D).

Figure 2 below shows the national trend in U.S. anthropogenic NO_X, VOC, CO, and CH_4 emissions from 2002 to 2021.[4] Anthropogenic emissions of NO_X from mobile and stationary sources have declined appreciably since 2002, largely as a result of multiple regulatory programs implemented over the past two decades, including the NO_X SIP Call, the Cross-State Air Pollution Rule (CSAPR), and the Tier 3 Light-duty Vehicle Emissions and Fuel Standards. Similarly, EPA regulatory programs have contributed to a substantial reduction in mobile source CO emissions over the past two decades. The EPA's regulatory programs have also led to reductions in VOC emissions from mobile sources, however, industrial sources, which are the largest anthropogenic source of VOCs, have stayed relatively constant during this time period. Anthropogenic CH_4 emissions have decreased only slightly since 2002, as reductions in the energy sector have largely been offset by increasing emissions in the agricultural sector.

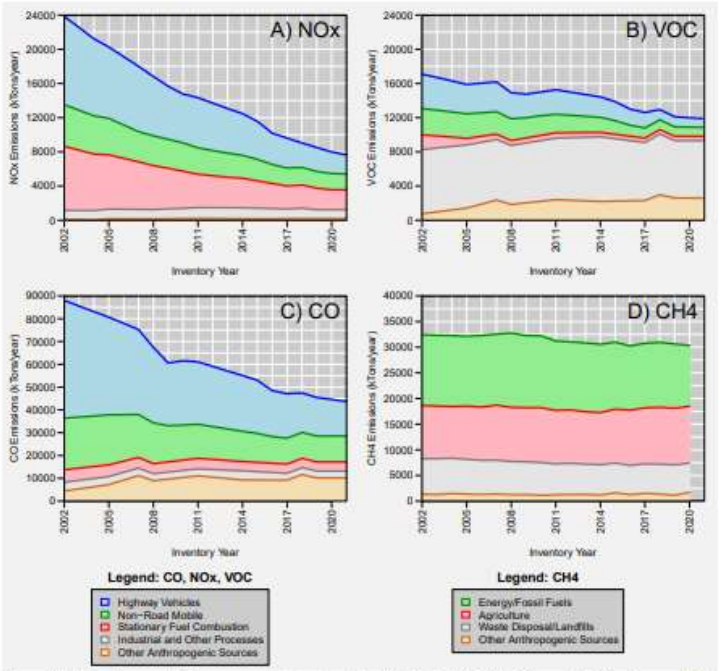


Figure 2. U.S. anthropogenic O_3 precursor emissions trends for: A) NO_X; B) CO; C) VOCs; and D) CH_4. **Source:** EPA's Air Pollutant Emissions Trends Data for panels A)-C), Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2020 for panel D).

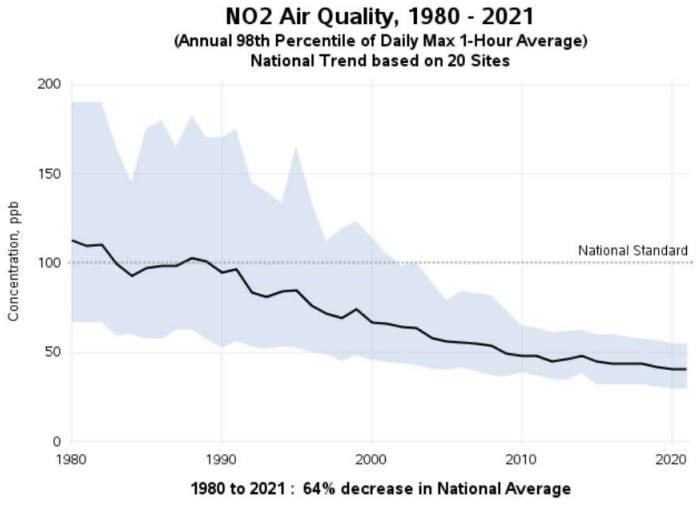
[4] NO_X, VOC, and CO data for Figure 2 come from the EPA's Air Pollutant Emissions Trends Data. Note that emissions for some sectors are interpolated between inventory years, and the emissions for some sectors are held constant beyond the most recent inventory year (for details, see the "Development of Data" table in the national emissions trends data file. For the purposes of this document, wildfires are considered to be natural emissions and thus are not included in Figure 2.

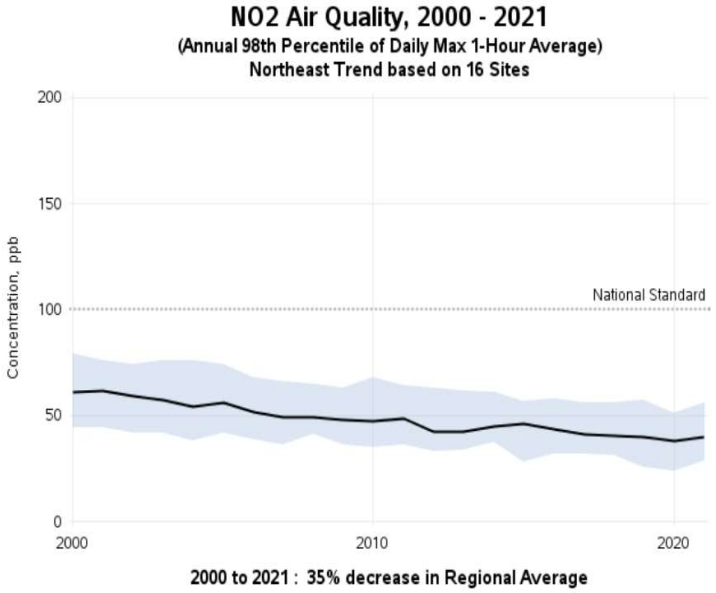
https://www.epa.gov/system/files/documents/2022-08/O3_2021_0.pdf

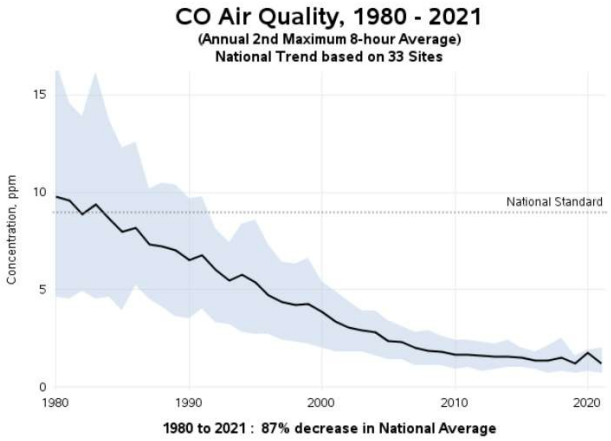
NO_2 and CO concentrations down bigly over 1980 to 2021 and 2000-2021

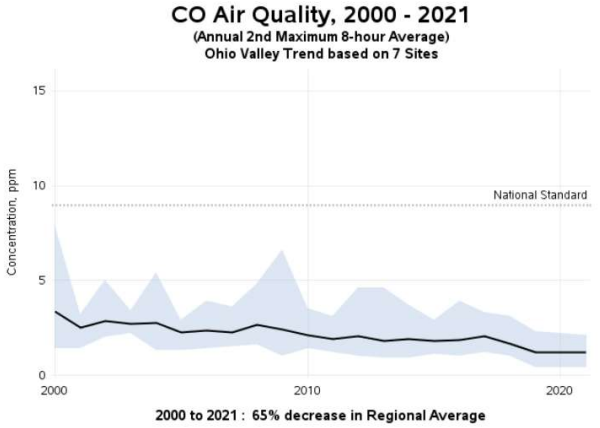
National Trends

Starting in 1980 | 1990 | 2000 | 2010









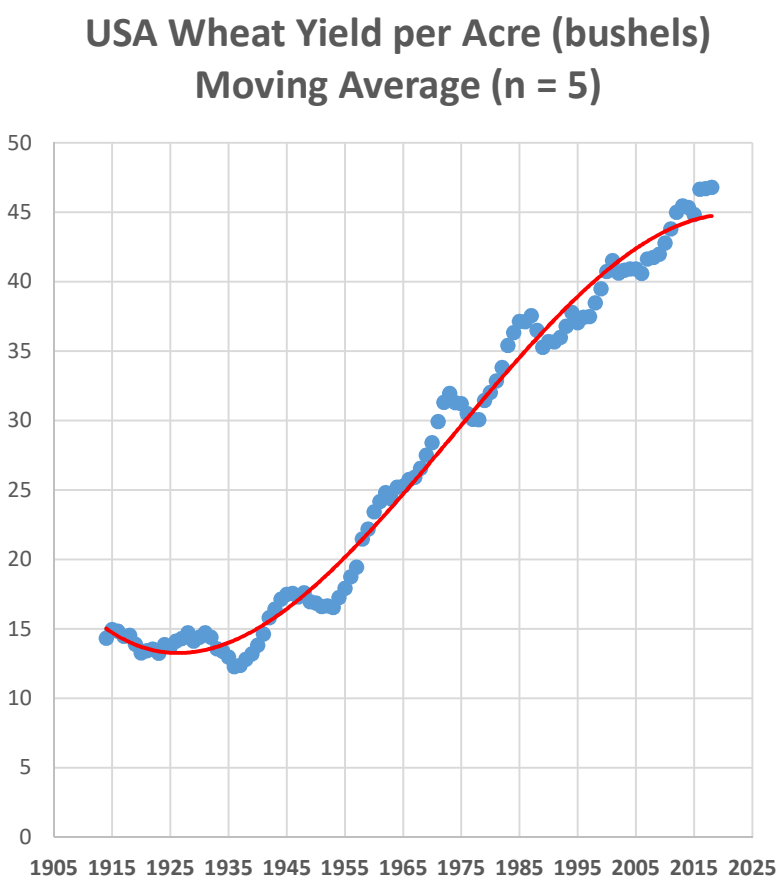
Reducing levels of carbon dioxide (CO_2) is NOT NECESSARY, and it's NOT DESIRABLE.

- Carbon dioxide (CO_2) has **NOT been PROVEN to DRIVE global temperatures and to accelerate global warming**
- Ice Core studies have shown that **CO_2 concentrations rise AFTER global temperatures rise,** and there have been periods in the earth's past where CO_2 levels have been much higher than present.
- **Higher CO_2 concentrations have increased crop yields dramatically in the last 5-6 decades**, and more famine would have resulted without these yield increases globally.

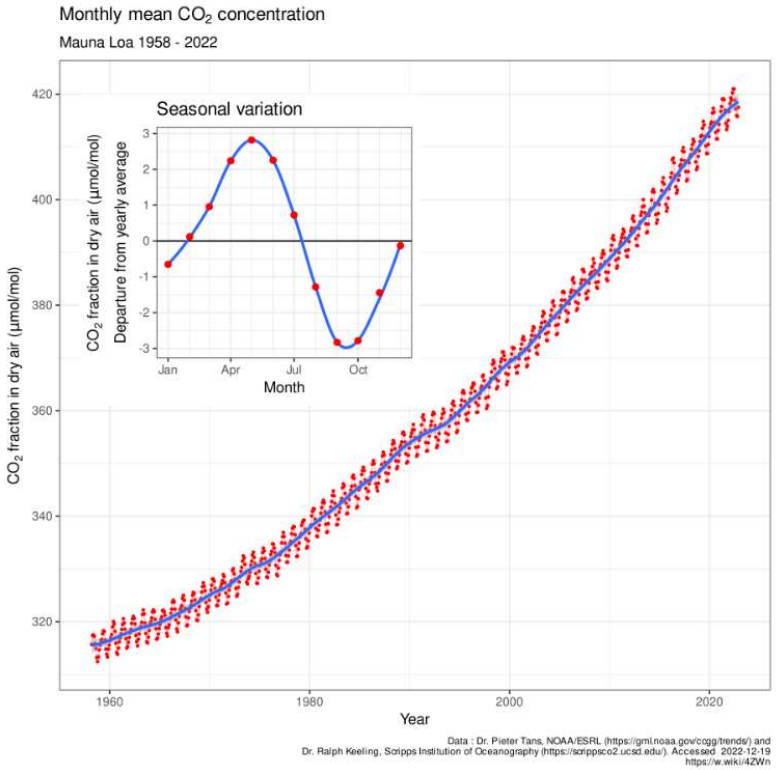
- Increased plant growth leads to higher emissions of isoprene, a highly reactive non-methane hydrocarbon that is responsible for the production of tropospheric ozone, which in turn is harmful to plant and animal life. Between 1901 and 2002, climate change at the global scale was responsible for a 7 percent increase in isoprene emissions. However, rising atmospheric CO_2 caused a more-than-offsetting 21 percent *reduction* in those emissions. Combined with anthropogenic cropland expansion, global isoprene emissions fell 24 percent during the twentieth century (Lathiere et al., 2010).

- Rising temperatures and atmospheric CO_2 concentrations, by increasing crop yields, will play a major role in averting hunger without the taking of new land and water from nature. For a nominal doubling of the air's CO_2 concentration, for example, the productivity of Earth's herbaceous plants rises by 30 to 50 percent and the productivity of its woody plants rises by 50 to 80 percent or more. In addition, atmospheric CO_2 enrichment typically increases plant nutrient and water use efficiency.

Wheat Yield per Acre in USA vs. CO2 concentrations in the atmosphere



Carbon Dioxide levels (Mauna Loa)



Some Reasons Why One Might Consider Increasing the Number of Electric Vehicles (not a mandate)

Reduce the use of petroleum for powering gasoline-powered vehicles

Positives

1. **Reduce air pollution from burning petroleum-based fuels (gasoline, diesel fuel, jet fuel)**
2. **Reduce consumption of petroleum so that it can be used/saved for other purposes (make it "last longer").**
3. **Reduce need to transport fuels by pipeline or by truck or train to avoid spillage due to leaks, accidents, fires, etc.**
4. **Reduce the soot and exhaust spewed by diesel commercial trucks and other vehicles on our roads.**
5. **Would reduce the amount of petroleum drilled for, pumped and transported will have ramifications on other products we obtain from petroleum including:**
    - **Rubber tires, chemicals, feedstocks for chemical and agricultural products, asphalt roads, paints, fuel for vehicles and motors that cannot be easily switched to electric motors such as heavy equipment, planes, jets, ships, etc.**

Negatives/Consequences

1. **Reducing the amount of petroleum drilled for, pumped and transported will have major negative impacts and ramifications on other products we obtain, produce and use from petroleum including:**
    - **Rubber tires, chemicals, feedstocks for chemical and agricultural products, asphalt roads, paints, fuel for vehicles and motors that cannot be easily switched to electric motors such as heavy equipment, planes, jets, ships, etc.**
2. **Would NOT eliminate the use of natural gas, coal, nuclear and other forms of "fossil fuels" being used to generate electricity.**
    - **The production of carbon dioxide would be moved from the vehicle to the stationary sources of electricity generation**
    - **It's not clear how much less CO2 would be produced if all cars were electric.**
    - **These likely scenarious do NOT CONSIDER the implications of obtaining materials to manufacture batteries, mining of lithium, cobalt, copper and other metals and the increased dependence on China and other producers of these materials and SOLAR PANELS, which market China, our major international threat, dominates**

Small Subset of Items Made from Petroleum

Ammonia
Anesthetics
Antifreeze
Antihistamines
Antiseptics
Artificial limbs
Artificial Turf
Aspirin
Awnings
Balloons
Ballpoint Pens
Bandages
Basketballs
Bearing Grease
Bicycle Tires
Boats
Cameras
Candles
Car Battery Cases
Car Enamel
Cassettes
Caulking
CD Player
CD's & DVD's
Clothes
Clothesline
Cold cream
Combs
Contact lenses
Cortisone
Crayons
Curtains
Dashboards
Denture Adhesive
Dentures
Deodorant
Detergents
Dice
Diesel fuel
Dishes
Dishwasher parts
Dresses
Drinking Cups
Dyes
Electric Blankets
Electrician's Tape
Enamel
Epoxy
Eyeglasses
Fan Belts
Faucet Washers
Fertilizers
Fishing Boots
Fishing lures
Fishing Rods
Floor Wax
Folding Doors
Food Preservatives
Football Cleats
Football Helmets
Footballs
Gasoline
Glycerin
Golf Bags
Golf Balls
Guitar Strings
Hair Coloring
Hair Curlers
Hand Lotion
Heart Valves
House Paint
Ice Chests
Ice Cube Trays
Ink
Insect Repellent
Insecticides
Life Jackets
Linings
Linoleum
Lipstick
Luggage
Model Cars
Mops
Motor Oil
Motorcycle
Helmet
Movie film
Nail Polish
Nylon Rope
Oil Filters
Paint
Paint Brushes
Paint Rollers
Panty Hose
Parachutes
Percolators
Perfumes
Petroleum Jelly
Pillows
Plastic Wood
Purses
Putty
Refrigerant
Refrigerators
Roller Skates
Roofing
Rubber Cement
Rubbing Alcohol
Safety Glasses
Shag Rugs
Shampoo
Shaving Cream
Shoe Polish
Shoelace Aglets
Shoes
Shower Curtains
Skis
Slacks
Soap
Solvents
Speakers
Sports Car Bodies
Sun Glasses
Surf Boards
Sweaters
Synthetic Rubber
Telephones
Tennis Rackets
Tents
Tires
Toilet Seats
Tool Boxes
Tool Racks
Toothbrushes
Toothpaste
Transparent Tape
Trash Bags
TV Cabinets
Umbrellas
Upholstery
Vaporizers
Vitamin Capsules
Water Pipes
Wheels
Yarn

Advantages and Disadvantages of EVs and Mandating EVs

Some Advantages of Electric Vehicles

- **Faster acceleration**
- **Quieter (positives and negatives of this!)**
- **No tailpipe emissions**

Some Disadvantages of Mandating Electric Vehicles

- **Insufficient electricity generation capacity**
  - The United States electrical generating capacity is currently inadequate to provide current electrical needs (heating, cooling, lights, computers/servers environment, etc.,etc.
- **The United States electrical grid is not stable enough or hardened enough to be able to handle the additional load and infrastructure required for widespread EV use and ownership.**
  - Wide use of only electric vehicles will likely require rationing of electric power.
- **Mandating electric vehicles will still require power plants to burn coal and natural gas and may require more nuclear power plant**
- **Will not reduce the production of CO_2 but will just change where the generation occurs from tailpipes to power plants.**
  - Wind power and solar panels are inadequate for providing all of our electricity needs
- **Electric vehicles are much more expensive to purchase than petroleum-powered vehicles**
  - Most people cannot afford to buy a new electric vehicle and used/pre-owned EVs will be problematic in terms of battery lives, cost to replace batteries, warranties, etc.
  - Batteries are very expensive to replace, costing over $10,000 dollars
- **EVs take too long to charge, compared to the time required to refill gasoline vehicles (and their mileage ranges are inadequate for long one-way or round-trip travel)**
  - Require 220V fast chargers to recharge in a reasonable amount of time.
- **Heavier electric vehicles will cause more damage and wear-and-tear to existing roads and highways.**
- **Tires don't last as long on electric vehicles compared to gasoline-powered vehicles**
- **Encouraging and/or mandating electric vehicles will cause gasoline and diesel to be less available and more expensive for existing gasoline and diesel vehicles.**
- **It will become more expensive and difficult to purchase and acquire gasoline- and diesel-powered vehicles, and may require going out of state to buy them**

Alternative Approaches to Explore for Vehicles

- Try a Pilot Program First for 3 to 5 years
  - Why not pilot a program first in a different blue state (or in one or more counties in a far left blue state) like Khalifornistan to see if such an all-electric vehicle program would work at all and what the pros and cons would be in practice and practicality.
- Allow an all-of-the above approach for electricity generation and for types of vehicles available for purchase.
- Allow American ingenuity and entrepreneurship to be incentivized to invent and optimize fuel cells for vehicles, hydrogen powered vehicles, etc.