Presentation to the Wisconsin Department of Natural Resources
Air Management Study Group
May 4, 2022

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https://hollowaygroup.org/project/health-benefits-of-clean-energy
What is the influence of 2030 light duty EVs on Wisconsin emissions?

Examined two EV penetration scenarios

- 13% of miles travelled - based on EPA’s analysis for Light-Duty Vehicle GHG Emissions Standards
- 40% of miles travelled - 3X EPA’s projection for Light-Duty Vehicle GHG Emissions Standards

Note that the Biden-Harris Electric Vehicle Charging Action Plan target is for 50% of EV sales (as opposed to miles travelled) in the U.S. by 2030.
Analysis was conducted with consideration of transportation and electricity sectors.

- **Heavy Duty Vehicles**
- **Light Duty Vehicles**
- **EV Scenarios**
- **EGU Retirements & Carbon Commitments**
- **WI Power Plants**

**Transportation sector**
- Emission rates from USEPA MOVES model.

**Electricity sector**
- Based on historic WI emissions minus pending retirements and utility commitments.
MOVES model forecasts heavy-duty vehicle emissions decline due to improved emission controls and efficiency.

Annual heavy-duty miles travelled increase 18% from 2016 to 2032.

NOx and VOC emissions decline by over 60% over the same period.

Fuel mix remains constant at 91% diesel, 9% gasoline, and 0.2% CNG.

CO₂ emissions decline 8.9% (2016 to 2032) due to fuel efficiency improvements.
Annual heavy-duty miles travelled increase 16% from 2016 to 2032.

NOx and VOC emissions decline by 84% and 50%, respectively, over the same period.

Fuel mix changes from 97.5% gasoline in 2016 to 96.2% gasoline in 2032. EVs represent 0.24% of 2032 VMT.

CO₂ emissions decline 18.7% (2016 to 2032) due to fuel efficiency improvements.

Even without EVs, light-duty vehicle emissions decline due to improved emission controls and fuel efficiency.

Light Duty Vehicles
How do electricity sector emissions change based on planned retirements and stated commitments?

**BASELINE 2021** - Planned retirements and commitments through 2021 are removed from the 2019 EPA-reported baseline.

**REFERENCE CASE 2030** - Planned retirements through 2030 are removed from the emissions inventory. Emission reductions from retirements exceed commitments.

*2030 emissions are based on an adjustment of historic emissions and not a forecast generated with a power sector model.*
EV13 Scenario: 13% Penetration based on EPA Light- Duty Vehicle GHG Emissions Standards

**Assumptions**

- 2.5 % per year light duty car fleet penetration
- 3.1% light duty car fleet penetration
- %75/%25 BEV/PHEV split for cars and trucks
13% and 40% EV scenarios (million vehicle miles)
Any future EV impacts will occur alongside major emission changes for internal combustion engines, as well as a shift toward renewable electricity supply.
For light duty vehicles, on-road emission reductions are proportional to the increase in EV-miles travelled.

Electricity provides a cleaner transportation fuel than gasoline, assuming it is supplied from Wisconsin generators, except for SO$_2$. Electricity demand partially diminishes the vehicle’s emissions savings, depending on how the incremental electricity supply is sourced.
Emission Impacts From Wisconsin Electric Vehicle Adoption Scenarios

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