Automobile Efficiency
Challenges and Opportunities for Addressing a Major Part of CO₂ Emissions
Teach-In • March 9, 2020

Today's panel and format

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1. Presentations by panel (about 10 minutes each)
2. Open discussion
3. Program ends at 1:30
4. We have room until 2:00
   Some of us can linger for continuing conversations
Automobiles (cars and light trucks including pickups, SUVs and minivans) are the "largest part of the largest part" of U.S. CO₂ emissions

New fleet average CO₂ emission rate and contributions by vehicle class

- Overall fleet average CO₂ emission rate declined by 23% from 2004 to 2017.
- Efficiency gains and CO₂ reduction progress now appear to have stalled, statistically speaking.
- Market has been trending back to larger and faster vehicles, mainly SUVs but also pickups for sport and play (some "off the books").
- Excess CO₂ emissions from shift back to light trucks is 3 times greater than the CO₂ savings from electric vehicle sales to date.

Electric vehicles are perhaps the ultimate in efficiency.

<table>
<thead>
<tr>
<th>Electric Vehicle</th>
<th>CO₂ Emissions per Year</th>
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<tbody>
<tr>
<td>Blue electric vehicle</td>
<td>1.7</td>
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<tr>
<td>Red gas-powered vehicle</td>
<td>7.6</td>
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Stronger fuel economy and GHG emissions regulations are crucial.

But we can't neglect the need to raise efficiency across the entire fleet.

Regulatory policies

- Standards are a crucial tool for controlling emissions
  - Corporate Average Fuel Economy (CAFE) Standards
  - Greenhouse Gas (GHG) Emissions Standards
    - Authorized by the Clean Air Act (CAA) Amendments of 1970 and based on the EPA finding that CO₂ and other GHGs endanger public health and welfare
    - California can set emission standards through a waiver of Federal preemption under the CAA, and other states can opt into the California standards
  - Single National Program negotiated by Obama Administration
    - Coordinated implementation of CAFE standards with Federal and California GHG standards
    - At behest of automakers, Trump Administration proposes weaker standards and has withdrawn California's waiver for maintaining the state's own strong standards
Can we expand environmentally conscious car buying?

- Weak consumer interest in higher efficiency makes the regulatory task more difficult
- Nevertheless, significant numbers of consumers are concerned about global warming
  - Many also believe that consumers themselves have some responsibility for addressing the problem; a foundation exists for cultivating consumer interest at a meaningful scale
  - Do not need to motivate all of consumers; a significant market segment could be helpful
- Message: "Buy the most efficient vehicle that meets your needs and fits your budget"
- Question: is it an "all or nothing" situation?
  - Can enough consumers become motivated to buy more efficient gasoline vehicles, as opposed to only equating "green" with EVs or other alternative (non-petroleum fuel) options.
  - Perhaps we can approach the issue with "The Power of AND" - Parallel efforts to both promote electrification and broad-based green car buying
Overview

- Transportation climate challenges and CO\textsubscript{2} reduction goals
- Current GHG/fuel economy standards for light-duty vehicles
- Mid-Term Evaluations and SAFE rule
- Related developments and conclusions
Climate Challenges and Goals

• Recent IPCC reports (2014 and 2018) conclude:
  ▪ Risks of climate change are considerable at 1 or 2°C above pre-industrial levels
  ▪ We are already seeing the consequences of 1°C of global warming and limiting warming to 1.5°C would require CO₂ emissions to reach ‘net zero’ by 2050

• California and many other governments have adopted an economy-wide goal of 80% reduction by 2050 along with plans to phase out internal combustion engines

• Widely accepted that the only way to achieve these goals for passenger cars is through the deployment of zero-emission vehicles (ZEVs)
GHG/FE Standards for Light-Duty Vehicles

- EPA and NHTSA finalized joint rules in April 2010 and in August 2012 that created "one national program – supported by auto companies, labor, suppliers, NGOs, and states/local governments
- By 2025, average fleet-wide CO₂ emission levels projected to be 163 g/mile which is equivalent to 54.5 mpg – rules allow autos to respond to changing market demand and provides numerous compliance flexibilities
- Average price increase for 2025 vehicle projected to be about $1800; the net lifetime savings is estimated to be $5000 per vehicle
- Combined program reduces CO₂ emissions by 6 billion metric tons
- August 2012 rule included a commitment by EPA and NHTSA to conduct a "mid-term evaluation" (MTE) of the MY2022-2025 standards

A Win-Win-Win for the Environment, Industry, and Consumers

- Leads to significant CO₂ reductions
- Established national CO₂/FE standards
- Provided autos with regulatory stability and certainty
- Delivers substantial net lifetime savings for consumers
Midterm Evaluations of the MY2022-2025 Standards

- In January 2017, EPA made a Final Determination (FD) that the MY2022-2025 standards remain appropriate.
- California’s midterm evaluation (MTE) completed on March 2017 also concluded that the MY2022-2025 standards remain appropriate.
- On March 22, 2017, EPA published its intention to reconsider the FD, and on August 23, 2017, EPA issued a notice requesting comment on its reconsideration of the FD along with the MY2021 standards.
- In April 2018, EPA withdrew the previous FD and concluded that the standards should be revised.

Projected CO2 Benefits of Light-Duty GHG Rules (million metric tons)

- No Rule
- Phase 1 Rule
- Phase 2 Rule

Derived from EPA's ICBT Model normalized to AEO 2020
The Safer Affordable Fuel-Efficient (SAFE) Rule

- Proposal was issued on August 24, 2018
- Proposed to rollback the existing MY2021-2026 GHG standards to current MY2020 levels
- Proposed to withdraw the previously approved CAA waiver provided to CA for the State’s GHG and ZEV programs
- Proposed that NHTSA’s CAFE statutory authority preempts CA and other states from setting their own GHG standards
- On September 27, 2019, EPA announced withdrawal of CA’s waiver and NHTSA finalized rules that preempt state from adopting their own GHG rules
- Final action on the standards is still pending, but expected in the April/May timeframe

SAFE NRPM Drastically Overestimates Costs and Understates Savings

- NHTSA fundamentally changed its modeling approach in SAFE - nearly all changes increased costs, reduced fuel savings, and understated GHG and emission benefits
- Wide spectrum of stakeholders have thoroughly documented errors, flaws, and biases in comments
- EPA career staff completely excluded from participating in analysis and its own modeling and data were ignored
- EPA’s Science Advisory Board Review recently concluded that the regulatory analysis had “significant weaknesses that should be addressed,” that “the weaknesses lead to implausible results,” and that the current standards “might provide a better outcome for society than the proposed revision”
- SAFE estimates are unusable because of these widespread technical flaws and deficiencies
Comparison of Net Benefit Projections Over Time ($ Billions)

Comparison of MY 2025 Vehicle Technology Cost Projections Over Time
Related Developments

• In July 2019, 4 autos agreed with CA on an alternative national framework
• In September 2019, DOJ launched anti-trust investigation of the 4 auto companies
• Numerous parties have filed lawsuits over revocation of the CA waiver and preemption
• GM, Toyota, and other autos have intervened in the litigation on behalf of the Administration
• Electric vehicles are now recognized as one of the leading strategies for significantly reducing transportation GHG emissions

Conclusions

• This win/lose conflict has created substantial uncertainty and instability for the auto industry
• The upcoming Presidential election is creating additional uncertainty
• The urgent need for setting post-2025 standards is stalled
• US leadership in developing clean technologies and fighting climate change is threatened