

EPA's GHG Rule



NACAA Fall Membership Meeting
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Presentation Overview



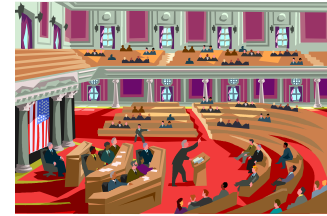
- **EPA Fuel Program Responsibilities**
- **Impetus for Controlling GHG's From the Transport Sector**
- **GHG Rulemaking Process and Timeline**
- **Inputs, Drivers, Considerations**
- **Overall Approach**
 - **Endangerment**
 - **Vehicles**
 - **Fuels**
- **Related Interests and Initiatives**
- **What's on the Horizon: Greenhouse Gas Rulemaking**
- **Conclusion and Questions**

Overview: EPA Fuel Program Responsibilities



- **Systems / Integrated Approach to controlling mobile source emissions through vehicles and fuels**
- **Focus on Fuels and Fuel Additives – Program Development and Oversight**
 - Conventional Fuels (Gasoline, Diesel)
 - Reformulated Fuels (Gasoline)
 - National Renewable Fuels Standard Program
 - New/Future Fuels/Programs (GHG, Other)
- **State Fuels**
 - State Air Quality Fuels (SIP Fuels – Boutique Fuels)

State of the Union



- In his 2007 State of the Union Address, the President called for a reduction in petroleum-based gasoline consumption by 20% in 10 years (Twenty-in-Ten plan)
 - 15% through renewable plus alternative fuels; equivalent of ~35B gallons
 - 5% through vehicle efficiency improvements; equivalent of ~4% per year

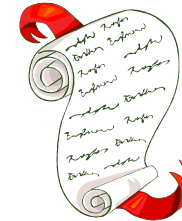
Supreme Court Decision



- On April 2, 2007, the Supreme Court ruled that the EPA must take action under the Clean Air Act regarding greenhouse gas emissions from motor vehicles.

- The decision had three elements:
 - States had standing to bring suit
 - Greenhouse gases are a pollutant under the CAA
 - EPA must use different criteria to base decision on whether or not to regulate

Executive Order



- On May 14, the President signed an Executive Order directing EPA:
 - To develop regulations to respond to the Supreme Court's decision
 - To use our existing authority under the CAA
 - To utilize the Twenty-in-Ten proposal as a framework
 - To work together with other Agencies (DOE, USDA, NHTSA) in doing so

Process and Timeline for GHG Rule

- **PREFACE: Everything Remains Under Consideration – No Final Decisions**

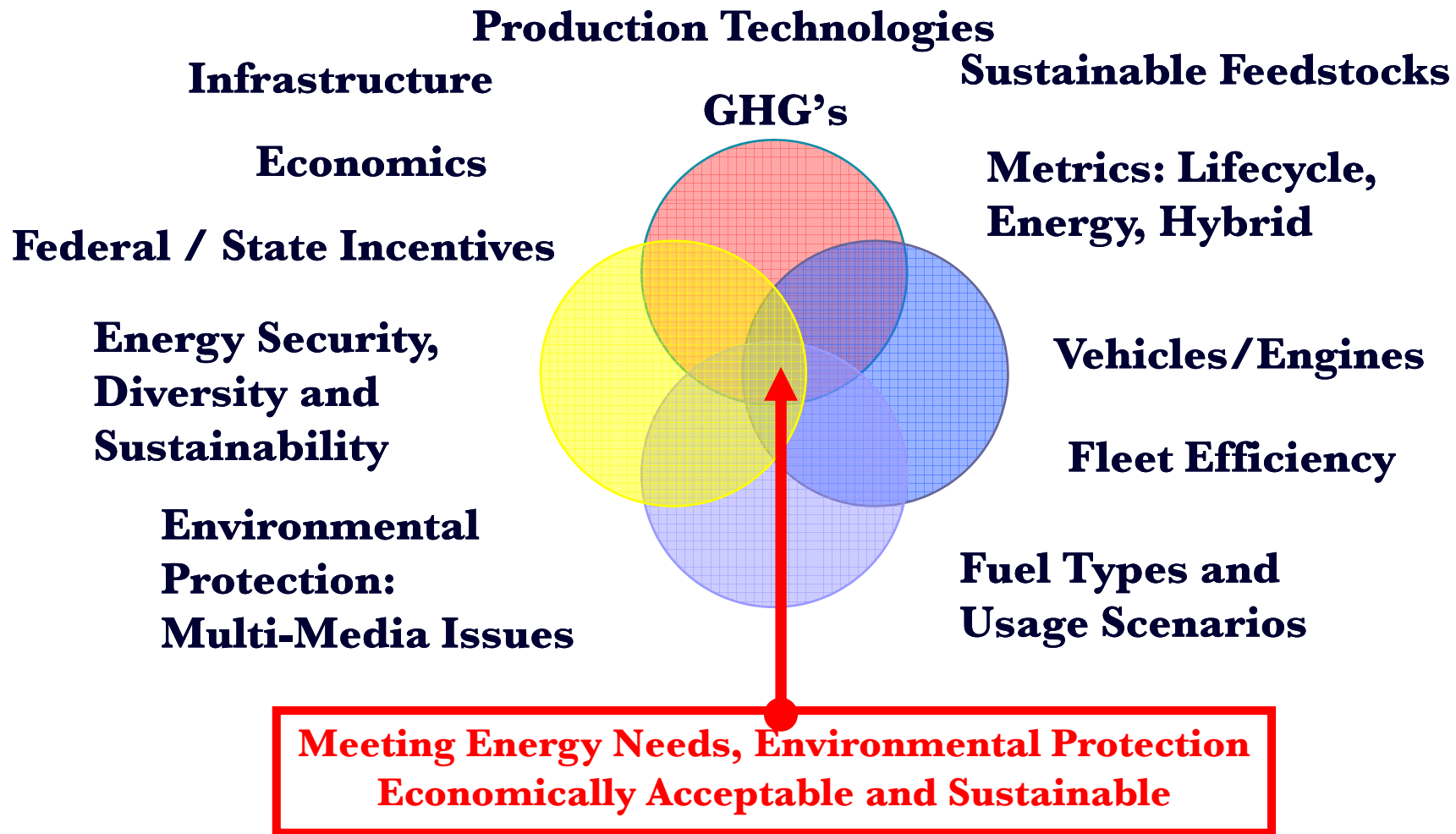
- **Currently, within this process, we are looking at three major areas of work:**
 - **Endangerment finding**
 - **Vehicle regulations**
 - **Fuel regulations**

- **General Process/Consideration**
 - **Substantial dialogue & coordination with other Agencies (DOE, USDA, DOT, NHTSA, OMB)**
 - **Address both vehicle and fuels -- use a “systems approach”**
 - **When setting standards consider**
 - **technology, cost, and lead time**
 - **safety, energy, benefits/impacts**
 - **flexible implementation mechanisms**

- **Schedule**
 - **NPRM by end of 2007**
 - **Final Rule by end of 2008**



GHG's Rulemaking: Multiple Inputs -- Multiple Parties -- Multiple Perspectives -- Varying Interests



Endangerment



Endangerment Finding



- Endangerment finding is prerequisite to standard setting under these statutory authorities
- Under Section 202:
 - The Administrator shall by regulation prescribe standards applicable to the emission of any air pollutant(s) from motor vehicles, “which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare.”
- EPA will not be creating a new scientific assessment
- EPA will rely most heavily on recently published, consensus-based, peer-reviewed assessments and reports
 - IPCC Fourth Assessment Report, 2007
 - CCSP Synthesis and Assessment Products (as available)
 - National Academy of Sciences
- Timeframe will be consistent with effects of GHGs on climate (i.e., over next few decades and beyond to ~2100)

Vehicles





CAA Authority for Vehicles

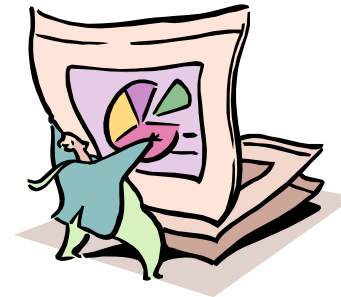
- Primary authority to regulate motor vehicle emissions falls under Section 202(a)(1):
 - “The Administrator shall by regulation prescribe ...standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or motor vehicle engines which in his judgment cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare.”

- First EPA rule to regulate GHG emissions from cars and trucks

- EPA and NHTSA technical teams jointly evaluating potential vehicle technologies to reduce GHGs and improve fuel economy
 - Carefully assessing feasibility, lead time and costs

Vehicle - Key Analyses

- Scope
 - While CAAA section 202 allows us regulate other mobile sources such as heavy-duty or nonroad, current focus is on light-duty cars & trucks (incl. MDPVs)
- Program structure
 - Basis/form of standard
 - Credit trading & implementation mechanisms
- Technological feasibility assessment
 - Stringency
 - Safety
 - Lead-time
- Cost analysis
- Benefits analysis
- GHGs & air quality analysis
- Economic impact assessment



Possible CO2 Improvement Technologies

- Vehicle and Accessories
 - Improved alternators, electrical & A/C systems and other accessories
 - Electric power steering
 - Improved low rolling resistance tires
 - Weight reducing material substitutions
 - Reduced Aerodynamic Vehicle Drag, through design
- Engines
 - Reduced Engine Friction & Improved Lubricants
 - Variable valve timing and lift
 - Cylinder deactivation
 - Gasoline direct injection
 - Turbocharging with engine downsizing
 - Clean Diesels
- Transmissions
 - 6-speed automatic
 - Automated manual “Dual Clutch” transmissions
- Hybrids (“micro”, “mild” and “full”)

Fuels



CAA Authority for Fuels

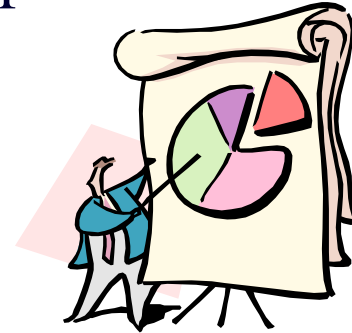


- 211(c) allows EPA to set controls on fuels as a means for reducing emissions of an air pollutant that endangers public health or welfare

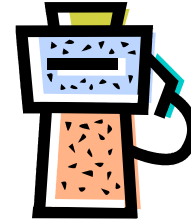
- CAA 211(o) added by EPA Act (2005) would allow us to require greater volumes of renewable fuels, but by itself is limited in scope
 - Alternative fuels cannot be included
 - Higher volumes could not be specified prior to 2013
 - Several restrictions (e.g., 48 state, gasoline only)

Key Analyses

- Basis/form of standard
- Trading & implementation mechanisms
- Lifecycle GHG and energy analysis
- Emissions inventories for criteria pollutants & GHGs
- Air quality analysis
- Benefits analysis
- Economic impacts
- Feasibility & costs
- Energy impacts, energy security
- Agricultural impacts
- Impacts on water quality, soil, pesticides, etc



Fuels Rulemaking



- Rigorous analyses is warranted given Volume Goals
- 35 billion gallon feasibility
 - What are the potential fuel pathways for achieving 35 billion gallons?
 - What are the relative costs of these fuels?
 - What vehicle-fuel combinations may be needed?
 - How can these increased volumes be distributed? Will there be enough truck and rail capacity? How many E85 stations will be needed?
- Addressing issues identified in RFS, e.g.
 - Lifecycle GHG model and assumptions
 - International impacts
 - Energy security assessment
- Air & water quality, and other factors relating to sustainability



Volume Feasibility & Costs



- Used available information from credible and public sources
- Evaluated values to estimate potential in 2017
- Added information based on additional discussions with experts
 - Held several meetings with DOE/USDA, agricultural sector consultations (Iowa State, etc), and industry
- Analysis primarily focused on:
 - Ethanol from US corn and cellulose, and ethanol imports
 - Biodiesel/Renewable Diesel
 - CTL / CBTLwCCS
- Evaluated on basis of:
 - Feedstock supply
 - Production capacity
 - Distribution and use capacity (incl. E85 infrastructure)
 - Costs (capital, fuel costs, corn ethanol, cellulosic, etc.)
 - Lead-time; Refining modeling
- Best estimate for each of the primary fuel options
 - Input from DOE, USDA, industry before picking primary volume scenario for NPRM analysis

Fuel Volumes: A Key Issue for Energy and Environmental Goals

□ **When, Where, How**

- **E10 blends – full saturation of gasoline market at E10 level in 2017 will use ~ 15 billion gallons of ethanol**

- **Increased use of E85 will play a role**

- Volume use limited by number of FFV's in 2017 and possibly by number of fueling stations

□ **Investigating mid-level ethanol blends such as E15 and E20 for opportunity for additional market penetration of ethanol**

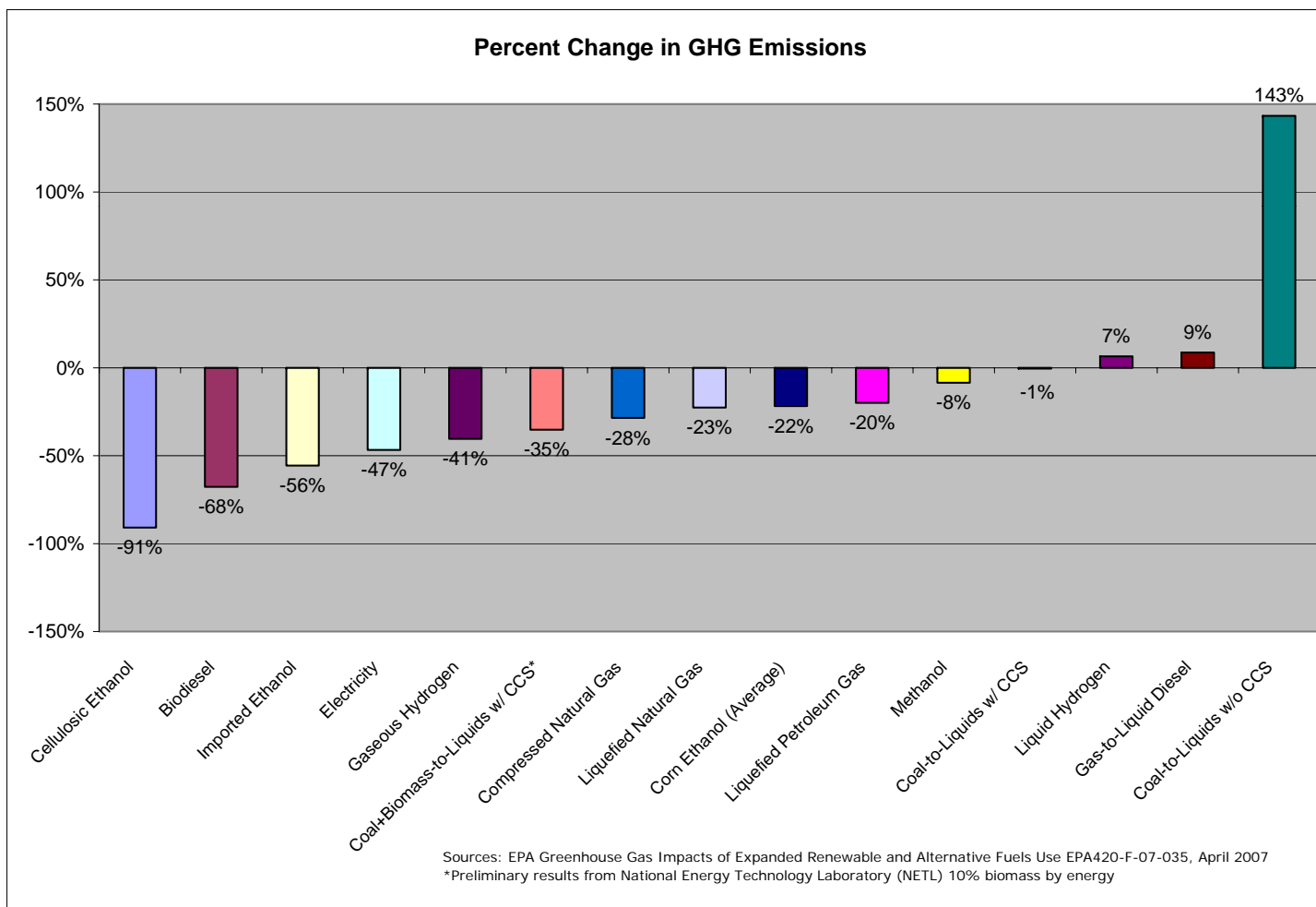
- **Requires Approval**



Differentiating Between Fuels on a GHG Basis

For Demonstration Purposes Only

Most values derived from RFS rule. Does not account for all inputs in LC Modeling





Co-Pollutant Emission Inventories

- Downstream: We are quantifying emission impacts on gasoline on-road and off-road sources
 - PM_{2.5}, VOC, NO_x, CO, Toxics

- Upstream: We are quantifying emission impacts of fuel changes on upstream processes
 - Reductions in gasoline fuel cycle emissions due to reduced demand
 - Emission impact of increased renewable/biofuels on agriculture, production, feedstock and fuel transportation



Co-Pollutant Air Quality Modeling

- Qualitative discussion of ambient air quality impacts for proposal
- Full-scale air quality modeling for the final rule
 - Using CMAQ
- Health impacts and monetized benefits/ disbenefits for final rule
 - Ambient ozone and PM_{2.5}

Agricultural Sector Impacts



- Domestic Impacts:
 - Evaluating key indicators used in the RFS
 - E.g. Commodity prices, land use changes, food prices, exports
 - For FRM, hope to evaluate impacts on water quality, water usage, soil erosion, and other environmental indicators
 - Using Texas A&M's U.S. Forest and Agricultural Sector Optimization Model (FASOM) to analyze domestic impacts
- International Impacts:
 - Evaluating implications in the international agriculture & fuels market
 - E.g. international livestock, grains, oilseeds, and sugar trade, prices, and physical flows.
 - Hope to have preliminary results available for the NPRM.
 - Plan to use Center for Agricultural & Rural Development (CARD) suite of econometric models to analyze international production, consumption, ending stocks and net trade.

Energy Security



- **U.S. energy security is broadly defined as protecting the U.S. economy against circumstances that threaten significant short- and long-term increases in energy costs**
 - Most discussion revolves around the economic costs of U.S. dependence on oil imports

- **Objective: To develop quantified estimates of the benefits of energy security due to reduced dependency upon foreign oil**
 - Through diversification of transportation fuels, and higher fuel economy, the U.S. expects to import less oil

- **EPA is using the Oak Ridge National Laboratory report, “Estimating the Energy Security Benefits of Reduced U.S. Oil Imports” (ORNL/TM-2007/028, March 2007)**
 - Same report used to support analysis for the RFS
 - Report is currently undergoing EPA’s Peer Review Process (with other Federal Agencies observing the process)
 - Process is expected to end mid-September, and ORNL will update its Report based on Peer Review comments
 - Estimates and Report to be provided for the NPRM

Data Gathering

- Gathering input on key elements:
 - Form of standard
 - Trading & implementation mechanisms
 - Feasibility
 - Costs
 - Flexibilities
 - Timing; phase-ins
 - Safety

- Key stakeholders:
 - Oil companies
 - Renewable & alternative fuels industries, including coal and electricity
 - Fuel distributors
 - NGOs
 - States
 - Small refiners, small volume mfrs



Other Activities of Interest in the Biofuels Area

- **Investigation, Research, Reports, Guidance**
 - Biomass Research and Development Board (Intermediate Blends)
 - National Biofuels Action Plan
 - DOE Intermediate Blends Investigation
 - National Advisory Council for Energy Policy and Technology
 - MORE, MORE, MORE



Questions



Thank you

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