EPA's Recent Advance Notice on Greenhouse Gases

2008 DEER Conference

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How it all began - The ICTA Petition & Supreme Court Decision

- October 1999-- International Center for Technology Assessment and 18 other groups file petition with EPA
  - Request that EPA regulate 4 GHGs from new motor vehicles under Clean Air Act Section 202(a) as air pollutants
- August 2003-- EPA denies petitioners' request
- April 2007 – Supreme Ct. rules EPA improperly denied ICTA's petition
  - GHGs are air pollutants under CAA and EPA must decide whether to regulate using permissible criteria

The Administration Response to the Supreme Court, and the Passage of EISA

- May 2007-- President issues Executive Order 13432
  - Directs EPA, DOE, DOT and USDA to take first steps toward regulations that cut GHG emissions from motor vehicles and their fuels
- December 2007-- Passage of Energy Independence and Security Act
  - Requires EPA promulgate new Renewable Fuels Standards (RFSII)
  - Amends DOT's authority to set CAFE standards for vehicles
    - Requires a fleet-wide average FE of at least 35mpg by 2020 for light-duty vehicles
  - Requires DOT to address fuel efficiency from highway HD vehicles

EPA Receives Additional GHG Petitions for Mobile Sources

- October 2007 to January 2008
  - EPA receives 7 additional petitions requesting EPA propose and adopt GHG standards for:
    - Aircraft
    - Ocean-going marine vessels
    - Nonroad engines and equipment

GHG ANPR

- March 27, 2008 - EPA Administrator's letter to Congress announces EPA's first step in responding to Supreme Court Ruling – will issue ANPR
  - Goes beyond Supreme Court's mandate
  - Allows for broader perspective
  - Explores many relevant sections of the CAA and implications of possible regulations of stationary and mobile sources
  - Will solicit public input and relevant information regarding interconnections and
    - Best available science relevant to making an endangerment finding
    - EPA's first responses to mobile source petitions and various stationary source rulemakings
- July 11, 2008 – ANPR Signed by Administrator
  - Published in the Federal Register on July 29

GHG ANPR - Scope

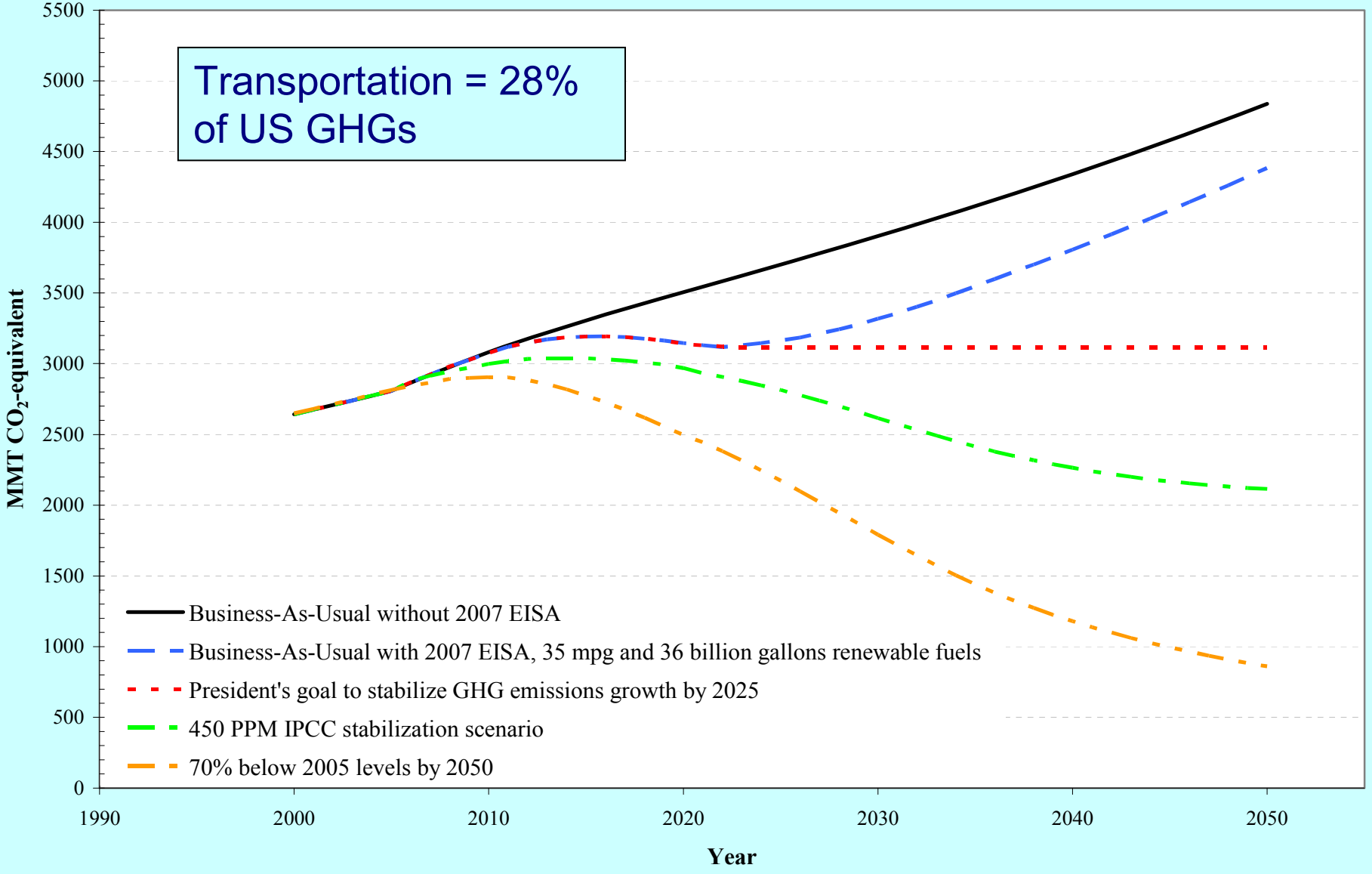
- GHG contributions from all US Sectors
- Public health & welfare impacts from climate change
- Detailed discussion of Clean Air Act authorities
- Implications and approaches for CAA GHG regulation for stationary sources and **mobile sources & mobile source fuels**
- Does NOT propose any actual standards or recommend specific approaches, and does not make a formal GHG endangerment finding
- Request public input on comment through out Notice on every topic discussed

Mobile Source Overview

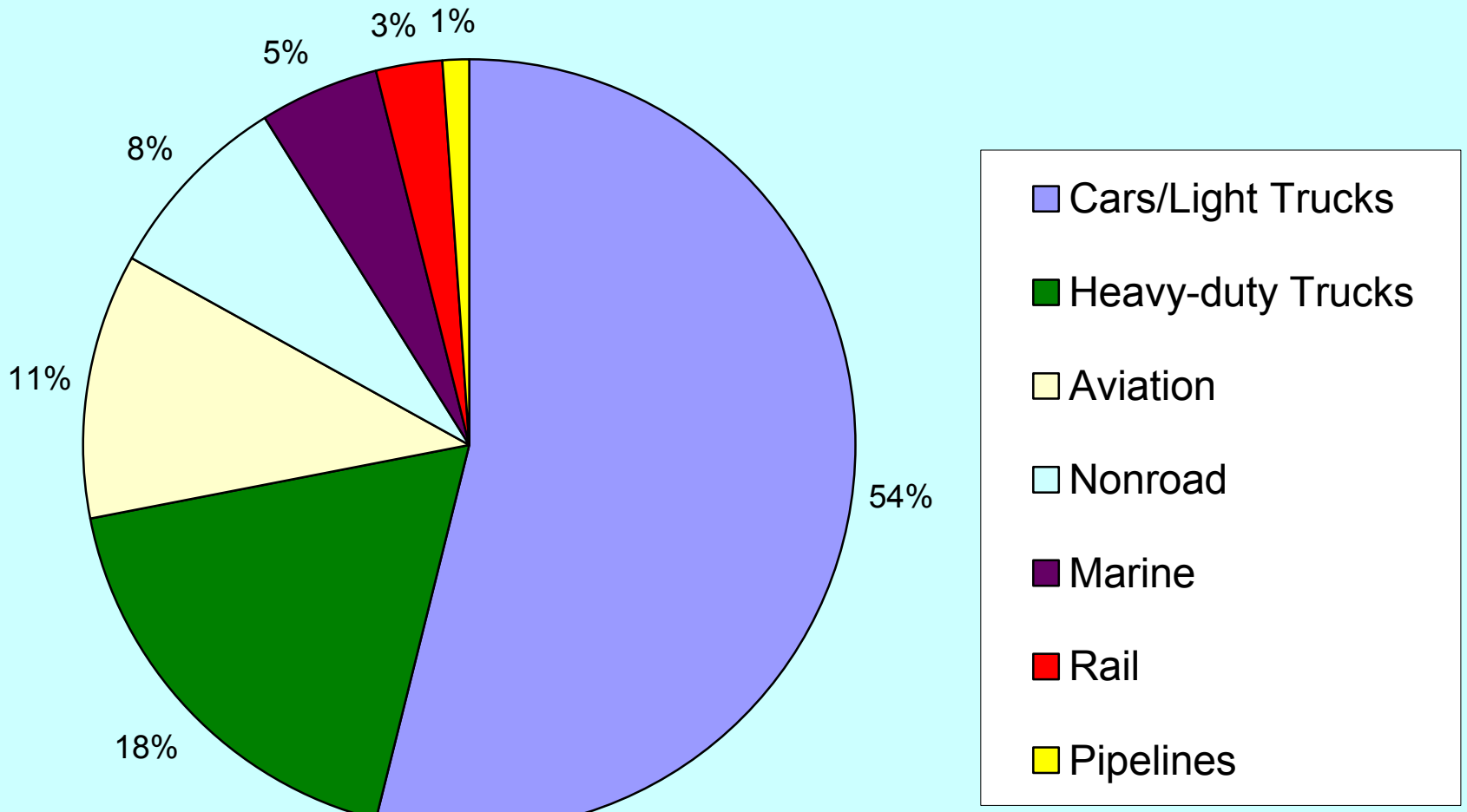
Title II of the Clean Air Act

- Provides statutory authority for EPA to address air pollution from mobile sources and mobile source fuels
- Title II provides significant discretion in how EPA can reduce air pollution from mobile sources
- Has been used successfully over past 30+ years on criteria pollutants (e.g., NOx, VOC, CO, PM)
- ANPR request input on how Title II could be used to address the significant, long-term challenges of GHGs from mobile sources

U.S. Transportation GHG Emissions Projections and Illustrative Targets Based on Proportional Reductions



U.S. Mobile Source GHG Emissions by Sub-sector (2006)



Light-Duty Vehicles

US Light-duty Vehicles

- 54% of mobile source GHGs
- ANPR discusses and request input on;
  - Appropriate approaches under CAA Title II
    - Time frames for standard setting (5yr, 10-15yrs, or longer)
    - Standard metrics (e.g., grams/mile)
    - Which GHGs should be addressed, and how (CO_2, N_2O, HFC, CH_4)
    - Test procedures
    - Compliance and enforcement programs
  - How to coordinate with NHTSA CAFE program
- Several hundred pages of technical support material
- Includes detailed analysis of specific standards

Analyzed LDVs GHG Stds.

New Vehicle Fleet Standard in 2020	232 g/mile CO2 [38.3 mpg]
GHG reduced in 2040	635 MMT CO2 equivalent
NPV of Net Social Benefits through 2040 (w/o CO2 valuation)	$830 Billion
NPV of CO2 valuation through 2040	$10 to $680 Billion
Per-vehicle cost	$1,920
Per-vehicle Lifetime Monetary Impact	$1,630

Key Notes:

- Several adv. technologies not considered (e.g., wide-spread weight reduction)
- Utilized AEO2007 Fuel Price Projections (~$2.10/gallon gasoline)
- Net Present Values (NPV) and Lifetime Monetary Impact calculated using a 3% discount rate

Beyond Light-Duty Vehicles: Heavy-Duty and Nonroad Engines

Approaches Discussed in ANPR for Building an Effective GHG Program

Operations-based measures—

- used in voluntary EPA programs (such as Smartway)
- may provide good opportunity to gain credits
- greater human element-- reductions must be verifiable
- provides many more options—
  speed reduction, idling reduction, system efficiency improvements, …

Vehicle-based measures—

- (or "equipment"-based, or "vessel"-based)
- has been EPA approach for LD highway – "g/mile"
- greatly expands the technology options --
  - transmissions, hybrids, …

Engine-based measures--

- traditional EPA standards-setting for HD highway and nonroad sectors – "g/hp-hr"
- rewards only engine design improvements --
  - electronic fuel controls, 2-stage turbos …

Each New Approach Brings Added Challenge … and Added Potential

The challenge:

Increasing complexity

The potential:

Increasing flexibility and effectiveness

Heavy-Duty Highway

- Trucks have been regulated under Clean Air Act §202 since 1974—
  - Diesels are now 98% cleaner
  - Same Clean Air Act provisions may be applied to GHG control
- ANPR requests comment on providing for vehicle-based controls through setting of "g/ton-mile" standards


Nonroad Engines and Equipment


A major Clean Air Act success story for criteria pollutants

- covers wide diversity in applications and engine sizes
- flexibility provisions and gradual phase-in have been key
- Tier 4 phase-in started this year → advanced Clean Diesel technology

ANPR requests comment on applying same provisions (§213) to nonroad GHGs

- Large potential to apply current and future highway engine technology
  - especially where fuel economy has not been a high priority in the past--
    - farm, construction, industrial, …
- And even where it has (railroads), much more can be done --
  - Some examples in ANPR: GPS-based automated throttling, track lubrication, hybrid, targeted electrification, cross-RR dispatching/tracking of railcars and locomotives

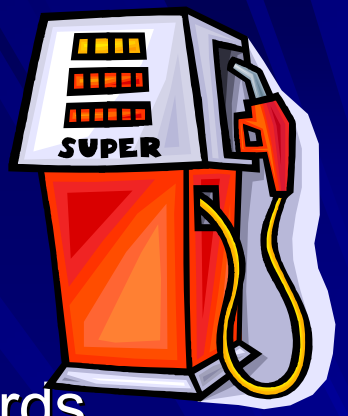
Marine Vessels

- EPA has been working with IMO to explore ways to reduce GHGs from ocean-going vessels
  - Important due to global nature and rapid growth of shipping business
- Past EPA standard-setting under same Clean Air Act provisions as for nonroad engines (§213)
- ANPR asks for comment on applying these to GHG control
- ANPR requests comment on a number of methods to reduce GHGs:
  - Engine-based – higher efficiency engines, waste heat recovery, …
  - Vessel-based – hull shapes and coatings, propeller designs, …
  - Operations-based -- reduced speeds, shoreside power, …

Aircraft

- FAA and ICAO play important roles in EPA standard-setting programs
  - Safety is always an important issue
  - International nature of air traffic raises need for coordinated programs
    - ANPR requests comment on proposed EC program:
      - A CO2 cap covering all flights in and out of EU
- ANPR also requests comment on ways to reduce aircraft GHGs:
  - More efficient engines
  - Airframe changes to reduce drag and weight
  - Operations changes
    - such as route and speed optimization, single-engine taxiing, …
- Comment requested on airline fleet-based approach (declining average GHG)

Fuels



- EPA is developing new Renewable Fuels Standards ("RFS2") under EISA
  - While the program will consider implications for GHG emissions, RFS is primarily focused on energy security
- The ANPR requests comment on whether the Clean Air Act provides EPA authority to directly regulate GHGs from all fuels
- ANPR requests comment on whether the CAA would allow EPA to establish a low carbon fuel standard
  - An effective GHG fuels program must thoroughly explore total life-cycle emissions of CO2, methane, and other GHGs

Conclusions

- Climate Change is a significant long-term challenge
  - Transportation sector will play a major role in any meaningful GHG reduction program
  - The Clean Air Act provides many tools for reducing mobile source GHGs
- EPA must respond to Supreme Court Decision, and recent 7 off-highway GHG petitions
- EPA would like input from all stakeholders on the important issues discussed in the recent ANPR