



Office of Transportation & Air Quality

The Changing U.S. Landscape for Climate Change Policy

**Christopher Gründler
DuPont Automotive Power Lunch
April 23, 2009**



What a Difference 3 Years can make.....



2006

Al Gore Releases the
Documentary:

“An Inconvenient Truth”

Wins Academy Award





2007

Fourth Assessment Report of the U.N.'s Intergovernmental Panel on Climate Change is released

Key Findings:

- “Warming of the climate system is unequivocal”
- “Most of the observed increase in temperatures is very likely due to the increase in anthropogenic GHG concentrations”

Panel Members share Nobel Peace Prize with Al Gore



2007 (cont.)

U.S. Supreme Court Decision (Massachusetts v. EPA):

- Clarified EPA Regulatory Authority under Clean Air Act
- If EPA finds that Greenhouse gas emissions pose a danger, must regulate
- Decision covers all Highway Vehicles
 - Passenger vehicles
 - Heavy Trucks



2008

Barack Obama Elected President:

“Now is the time to confront this challenge once and for all. Delay is no longer an option. Denial is no longer an acceptable response. The stakes are too high. The consequences, too serious. Stopping climate change won’t be easy. It won’t happen overnight. But I promise you this: When I am President, any governor who’s willing to promote clean energy will have a partner in the White House. Any company that’s willing to invest in clean energy will have an ally in Washington. And any nation that’s willing to join the cause of combating climate change will have an ally in the United States of America.”

-President-elect Barack Obama to Governors Global Climate Summit, Los Angeles, CA Nov 18, 2009



2009

Since January 21:

- President directs EPA to Re-consider Denial of California CO2 Standards for Vehicles
- President directs DOT to Re-consider Proposed Fuel Economy Standards
- President asks Congress for Legislation establishing Cap and Trade System for greenhouse gas emissions
- President signs Economic Stimulus
 - Significant investments and incentives for low CO2 measures and technologies



2009

President submits 2010 Budget:

“ The Administration will work expeditiously to develop an economy-wide emissions reduction program to reduce greenhouse gas emissions approximately 14 percent below 2005 levels by 2020, and approximately **83 percent below 2005 levels by 2050**. This program will be implemented through a cap-and-trade system...”



Recent EPA Actions on Climate

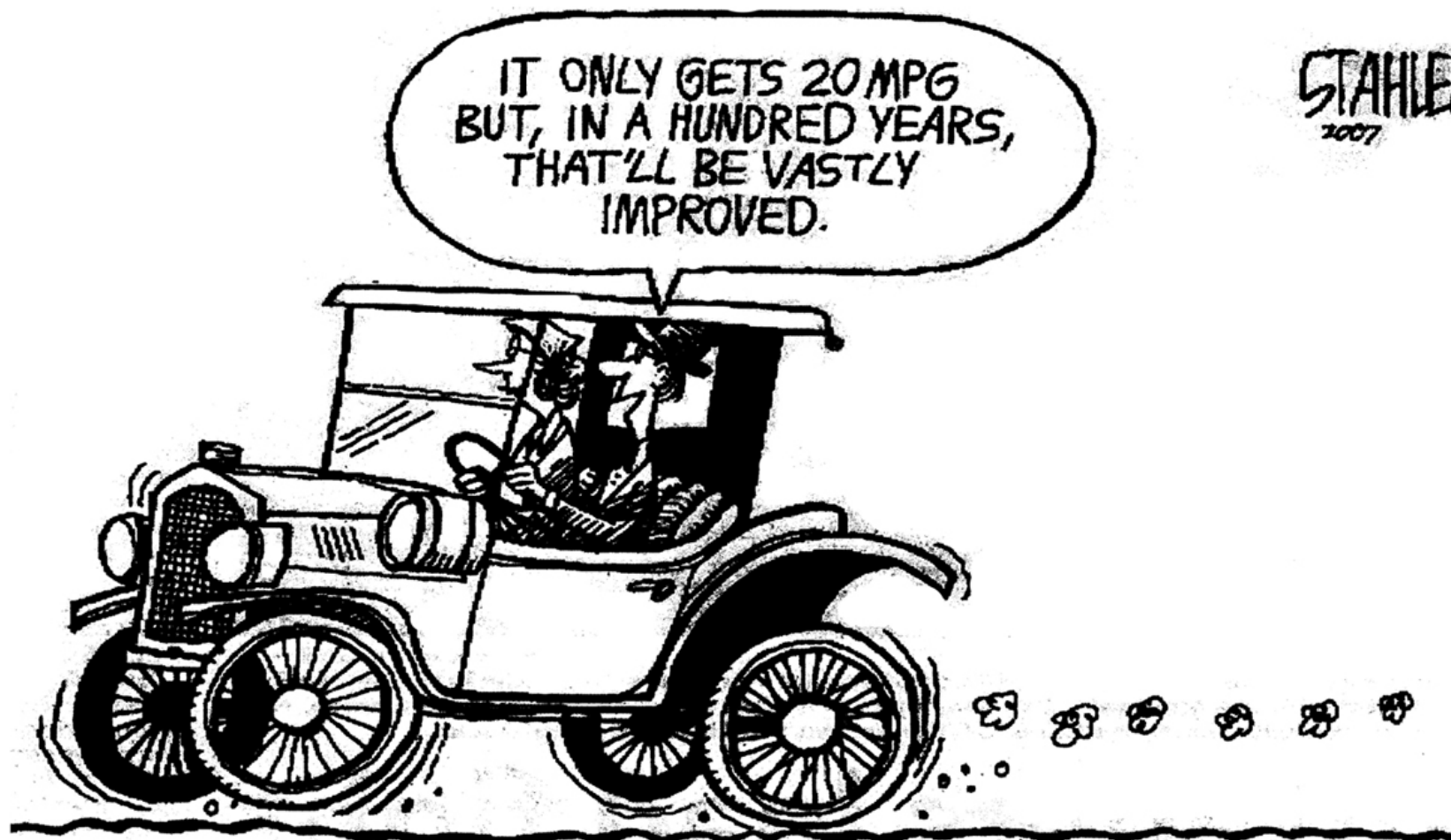
- Held Public Hearing March 5 on California CO2 standards for automobiles
- Proposed Mandatory Reporting Rule for greenhouse gas emissions
 - Covers all sectors of the economy
- Proposed finding that greenhouse gas emissions endanger public health and welfare



Implications of New Landscape for U.S. Automotive Marketplace



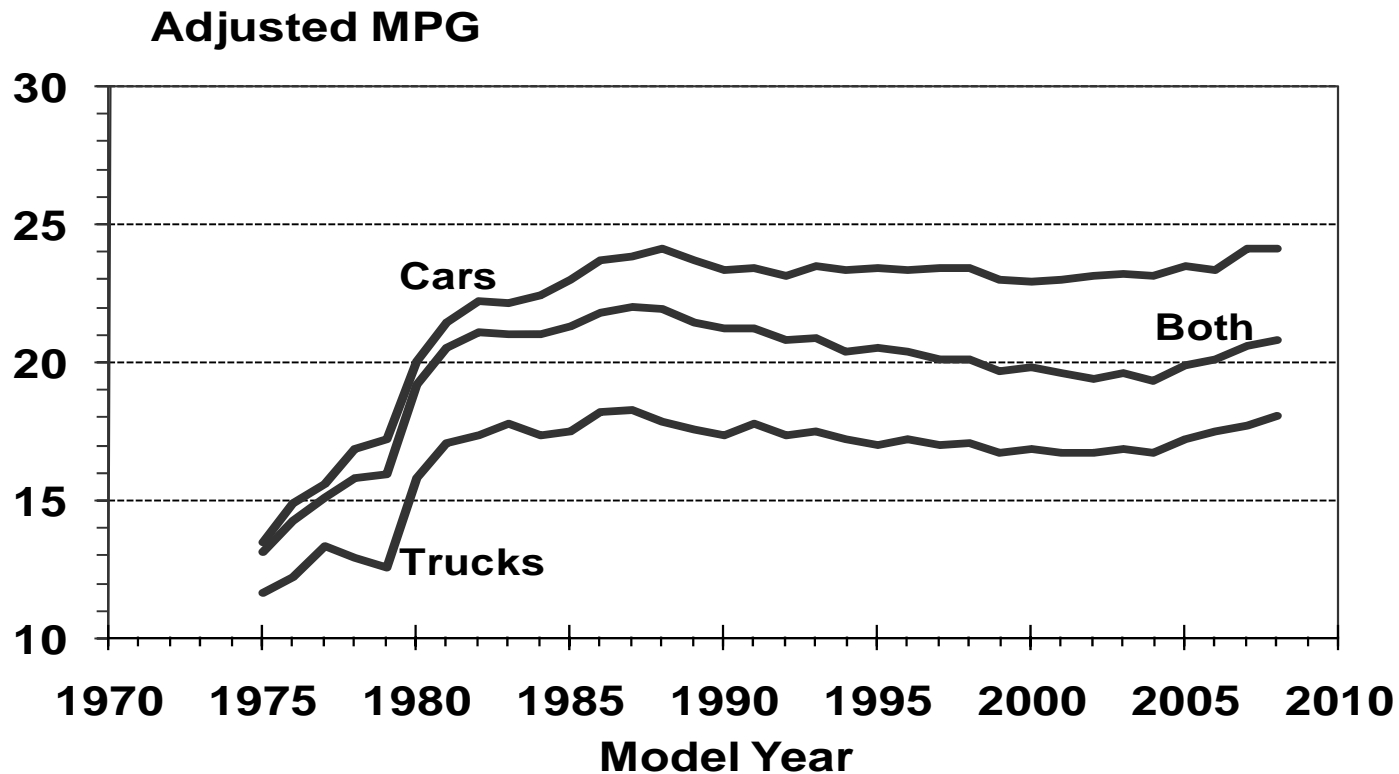
Historical Context: U.S. Car Culture





Historical Context: Still at 20 mpg

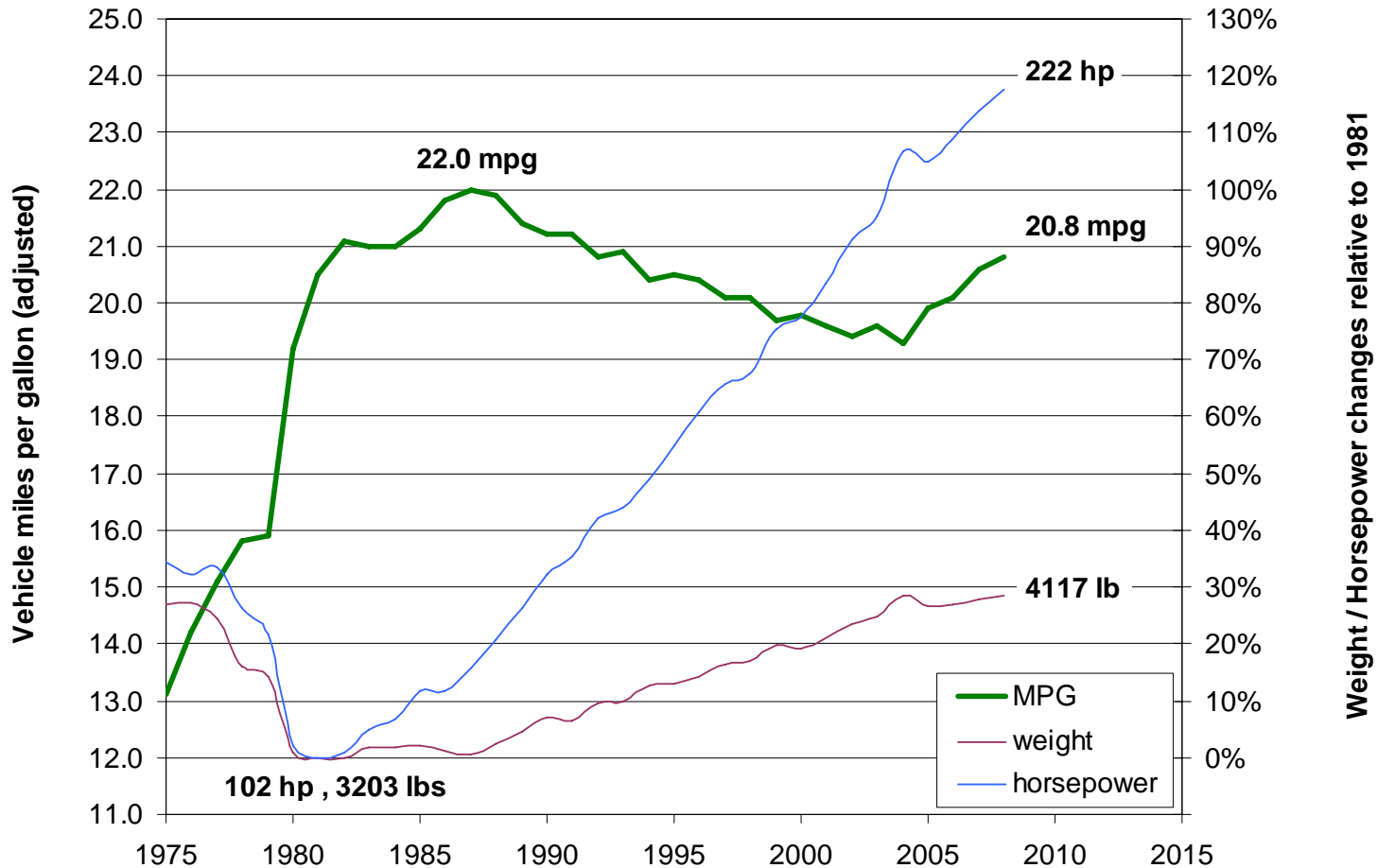
Adjusted Fuel Economy by Model Year (Annual Data)





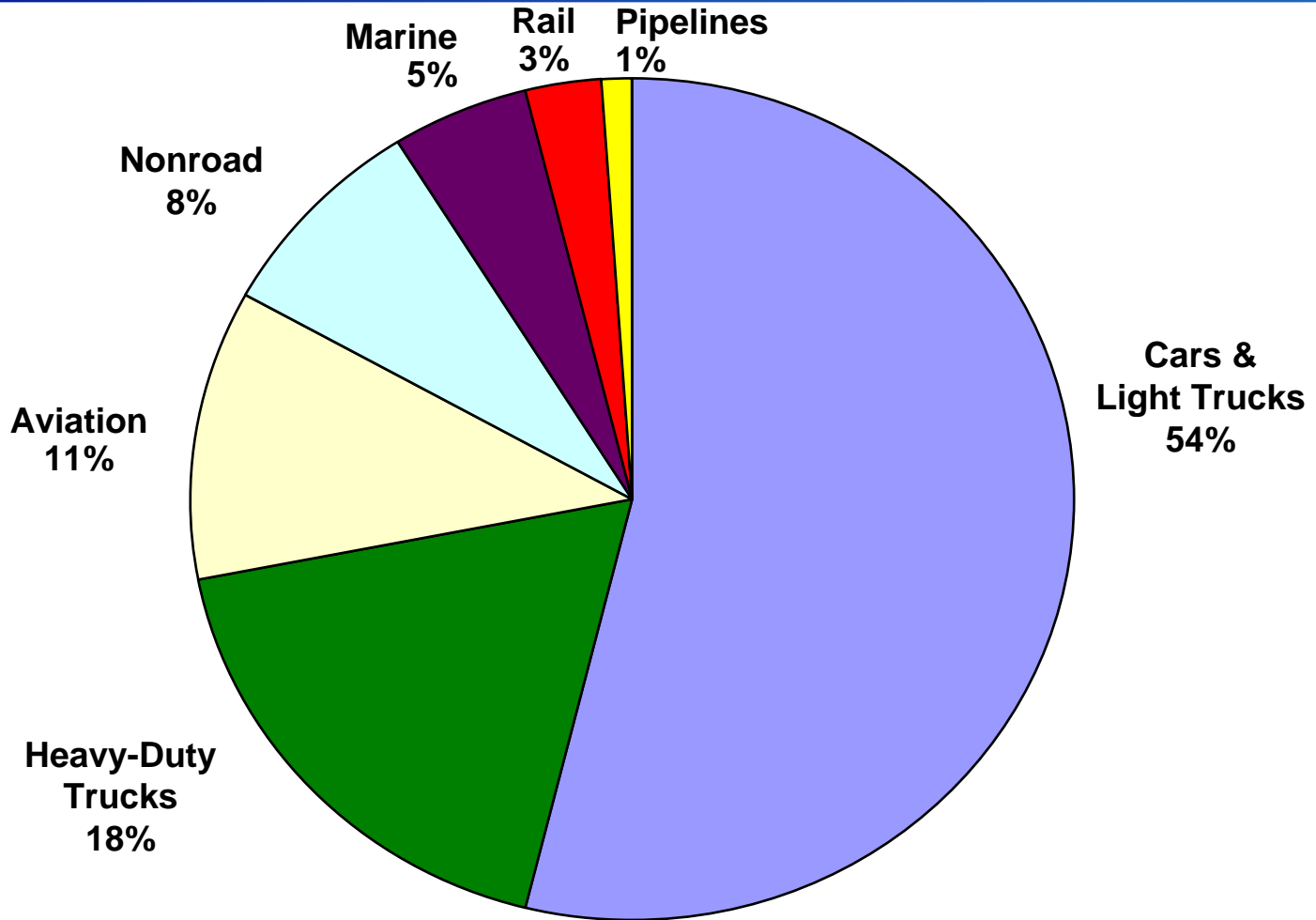
How Have We Used Technology?

(car + truck fuel economy = real world projections)





U.S. Transportation GHG Emissions (2006)





Cap & Trade and the Transportation Sector



Under a Cap, Transport Provides Relatively Small Proportion of CO₂ Reductions

- Most proposals place cap “Upstream”
- Most include Transportation Fuels

However:

- Upstream Cap provides weak price signal to auto manufacturers and consumers
- Will not cause large changes in demand, technology, or behavior

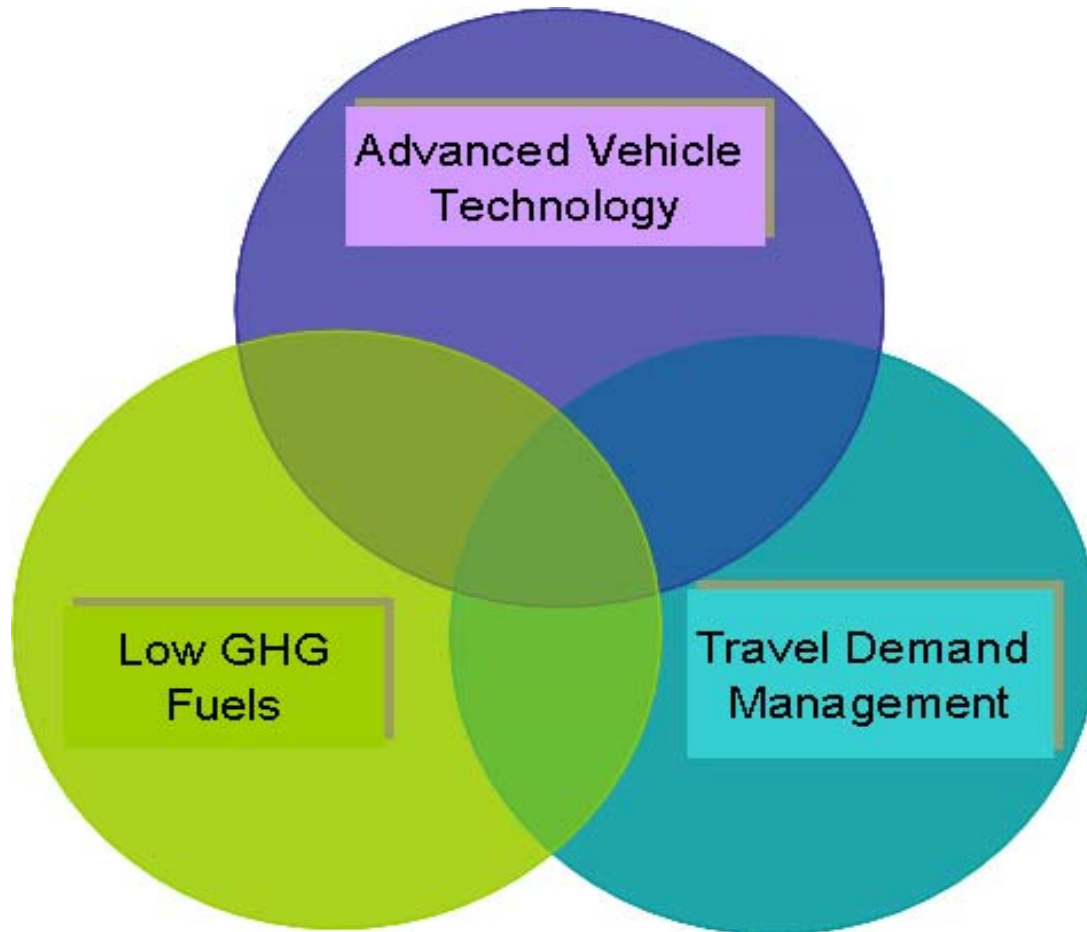


Need Complementary Measures to Achieve Transport Emissions Reductions

- U.S. Climate Action Partnership
 - 30 Major corporations and NGOs, inc. auto and oil
- Blueprint for Legislative Action
 - Consensus Recommendations
- Complementary Measures for Transport
 - Vehicle-Related Ghg Performance Standards
 - Fuel-Related Ghg Performance Standards
 - Reduce Carbon-Intensive Travel
 - Improve Transportation System Efficiency
 - Educate Consumers



System Approach to LD Vehicle GHG Reductions





Vehicle-Related Measures

- Light Duty Passenger Vehicles
 - California Emissions Standards
 - EPA Emissions Standards
 - CAFÉ Fuel Economy Standards
- Heavy Duty Trucks



Renewable Fuel and Transportation



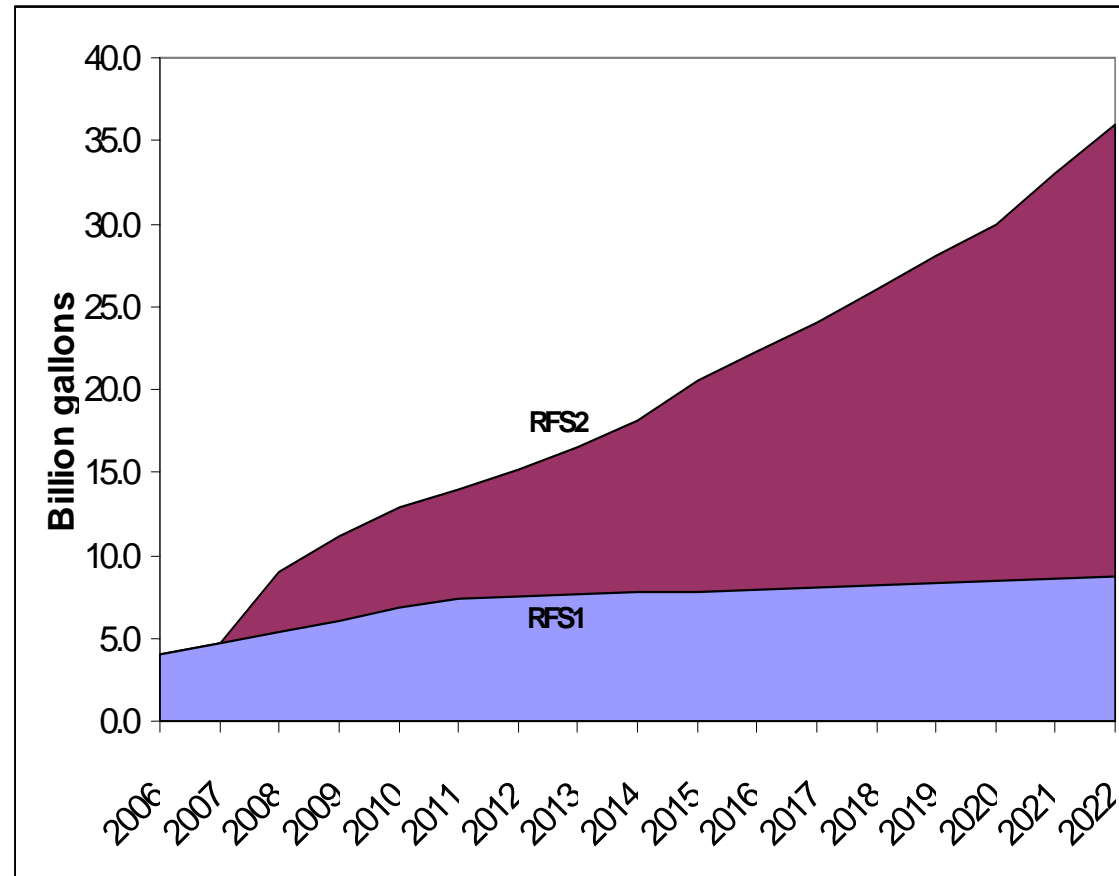
Energy Independence & Security Act of 2007

- EISA passed by Congress and signed by President in December 2007
- Modifies current RFS program (“RFS2”)

Volumes increase to 36 billion gallons/yr by 2022

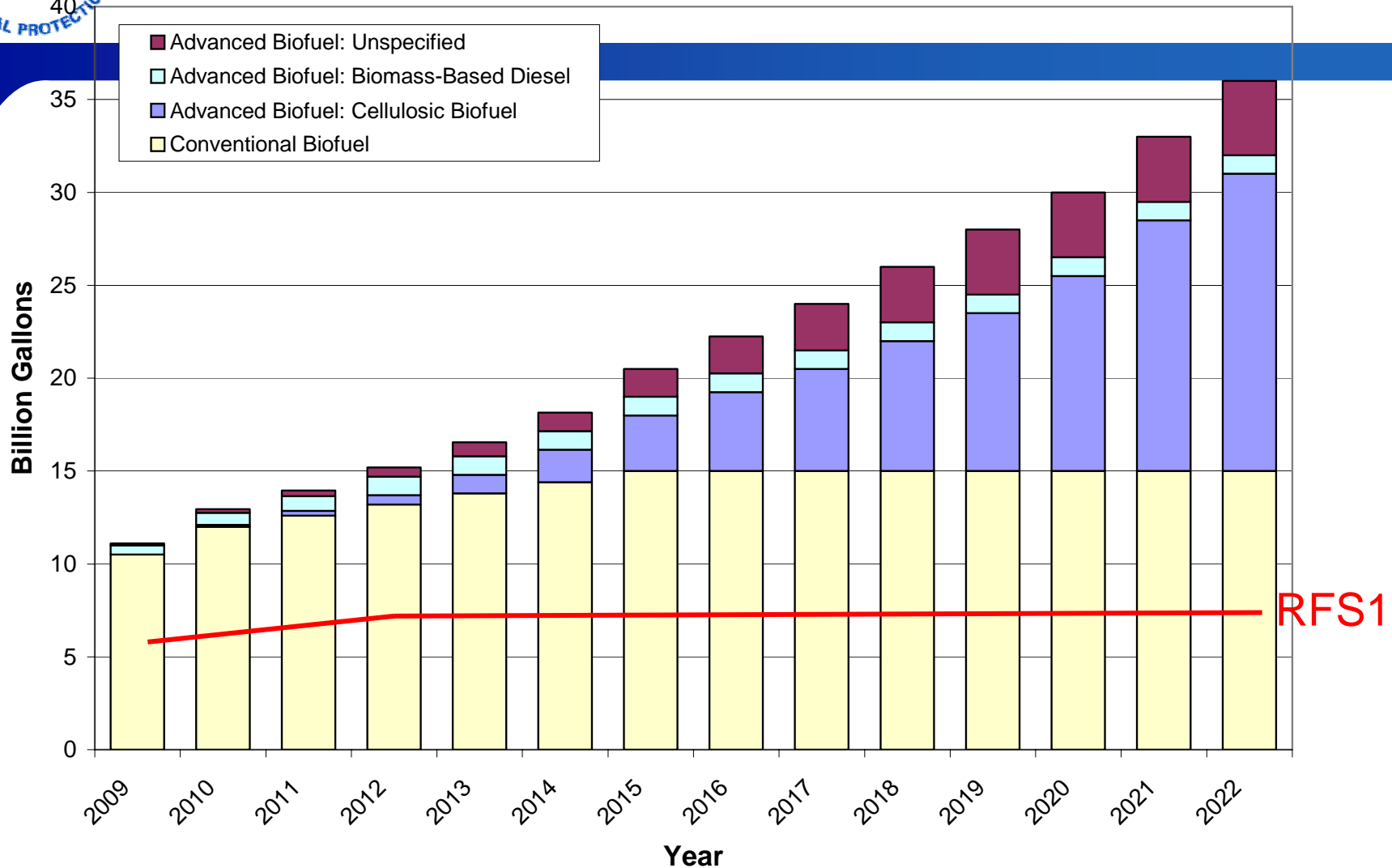
- 5-fold increase from current RFS levels

Establishes new categories and eligibility requirements





Domestic Market and Impact on Exports



- Majority of fuels produced in the U.S. will be consumed in the U.S.



EISA Requires Lifecycle Assessment

- Each fuel category required to meet mandated GHG performance thresholds (reduction compared to baseline petroleum fuel replaced)
 - **Conventional Biofuel** (ethanol derived from corn starch)
 - Must meet 20% lifecycle GHG reduction
 - Only applies to fuel produced in new facilities
 - **Advanced Biofuel**
 - Essentially anything but corn starch ethanol
 - Includes cellulosic ethanol and biomass-based diesel
 - Must meet a 50% lifecycle GHG reduction
 - **Biomass-Based Diesel**
 - E.g., Biodiesel, “renewable diesel” if fats and oils not co-processed with petroleum
 - Must meet a 50% lifecycle GHG reduction
- -- **Cellulosic Biofuel**
 - Renewable fuel produced from cellulose, hemicellulose, or lignin
 - E.g., cellulosic ethanol, BTL diesel
 - Must meet a 60% lifecycle GHG reduction



Definition of Lifecycle GHG Emissions

“(H) LIFECYCLE GREENHOUSE GAS EMISSIONS.—The term ‘lifecycle greenhouse gas emissions’ means the aggregate quantity of greenhouse gas emissions (including direct emissions and significant indirect emissions such as significant emissions from land use changes), as determined by the Administrator, related to the full fuel lifecycle, including all stages of fuel and feedstock production and distribution, from feedstock generation or extraction through the distribution and delivery and use of the finished fuel to the ultimate consumer, where the mass values for all greenhouse gases are adjusted to account for their relative global warming potential.



Life Cycle Boundaries- Components Included

- **Direct Impacts:**
 - Agricultural inputs (e.g., fuel used in tractor, energy used to produce and transporting fertilizer to the field) used to grow crops **directly used in biofuel production**
 - Fertilizer N₂O emissions associated with crops directly used in biofuel production
 - Land use change associated with converting land to grow crops directly used in biofuel production
 - Energy use and GHG emissions at production facility
 - Energy used to transporting feedstock to plant
 - Energy used to transporting fuel to end use
 - Vehicle tailpipe GHG emissions



Life Cycle Boundaries- Components Included

- **Indirect Impacts:**
 - Agricultural inputs and fertilizer N₂O emissions from **growing crops indirectly impacted** by use of feedstock for biofuel production (domestically and internationally)
 - Land use change associated with converting land to grow crops indirectly impacted by using feedstocks for biofuel production
 - Emissions from changes in livestock numbers that are indirectly impacted by feed prices & availability due to the use of feedstocks to produce biofuels
 - Rice methane emissions indirectly impacted by shifts in acres to produce feedstocks for biofuel production



Life Cycle Boundaries- Components Excluded

- Elements excluded were determined based on ISO life cycle assessment standards, using environmental significance as the cut-off criteria

For Example:

- Infrastructure-related activities are not included (e.g., emissions associated with the production of tractor or farm equipment)
- Construction-related emissions are also not included (e.g., steel or concrete needed to construct a refinery)



Methodology

- Including direct and indirect impacts such as land use change requires analysis of markets
 - Typical life cycle analysis tools are based on production process modeling
 - To capture market impacts need to use economic models
 - For areas of uncertainty, tested our primary approach and key assumptions with sensitivity analyses and different methods



International Agriculture and Land Use Change

- Questions we need to address in this analysis:
 - How much land is converted internationally?
 - What are the emissions trends from international crop production?
 - Where does land use change occur?
 - What types of land are converted?
 - What are the GHG factors from that land conversion?
 - How do we account for the time dimension of GHG releases?



Next Steps on Lifecycle

- Issue Proposal and seek comment on proposed approaches and alternative approaches
 - Planning to hold workshops on lifecycle analysis following proposal
- Engage experts between proposal and final rule
- Anticipate 3-5 year cycles for updating the analysis

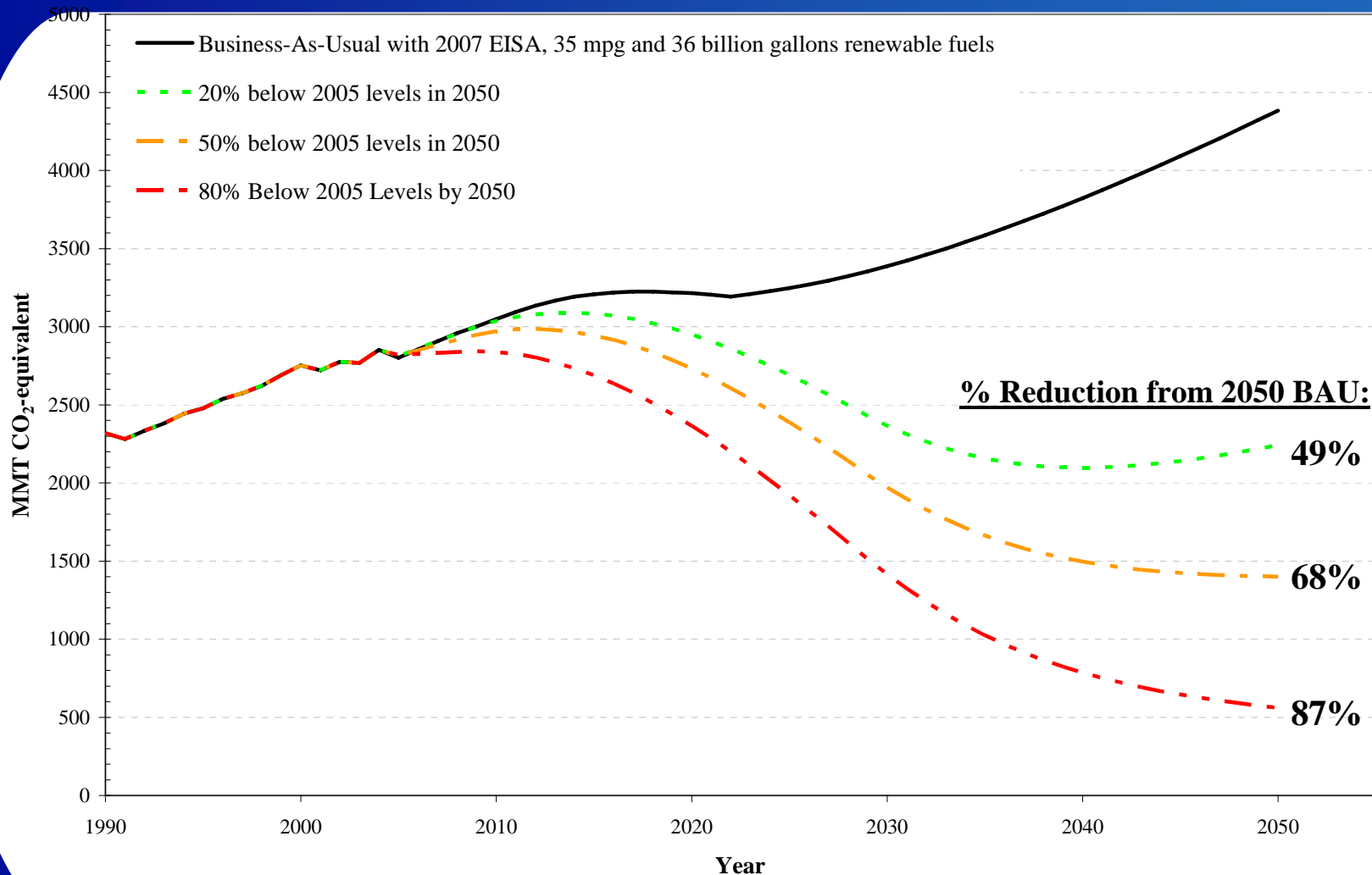


Other Renewable Fuels Issues to Consider

- Air Quality and other Sustainability Considerations
- Infrastructure and Distribution
- Definition of Crop Land
- Ethanol “Blend Wall” and Higher Level Blends



U.S. Transportation Sector GHG Emissions



(Includes all IPCC categories + nonroad + upstream fuel GHG emissions)



Integrating Climate Considerations into Business Planning

- U.S. consumer preferences changing
 - This will accelerate with greater concerns about climate and oil
- Essential to compete in global export markets
- Long-term GHG emissions targets require sustained, long-term innovation and game-changing technology
- Clearly part of the President’s “re-tooled, re-imagined” auto industry



“There is no better prize in life than working hard at work worth doing”

President Theodore Roosevelt