



Renewable Fuel Standard



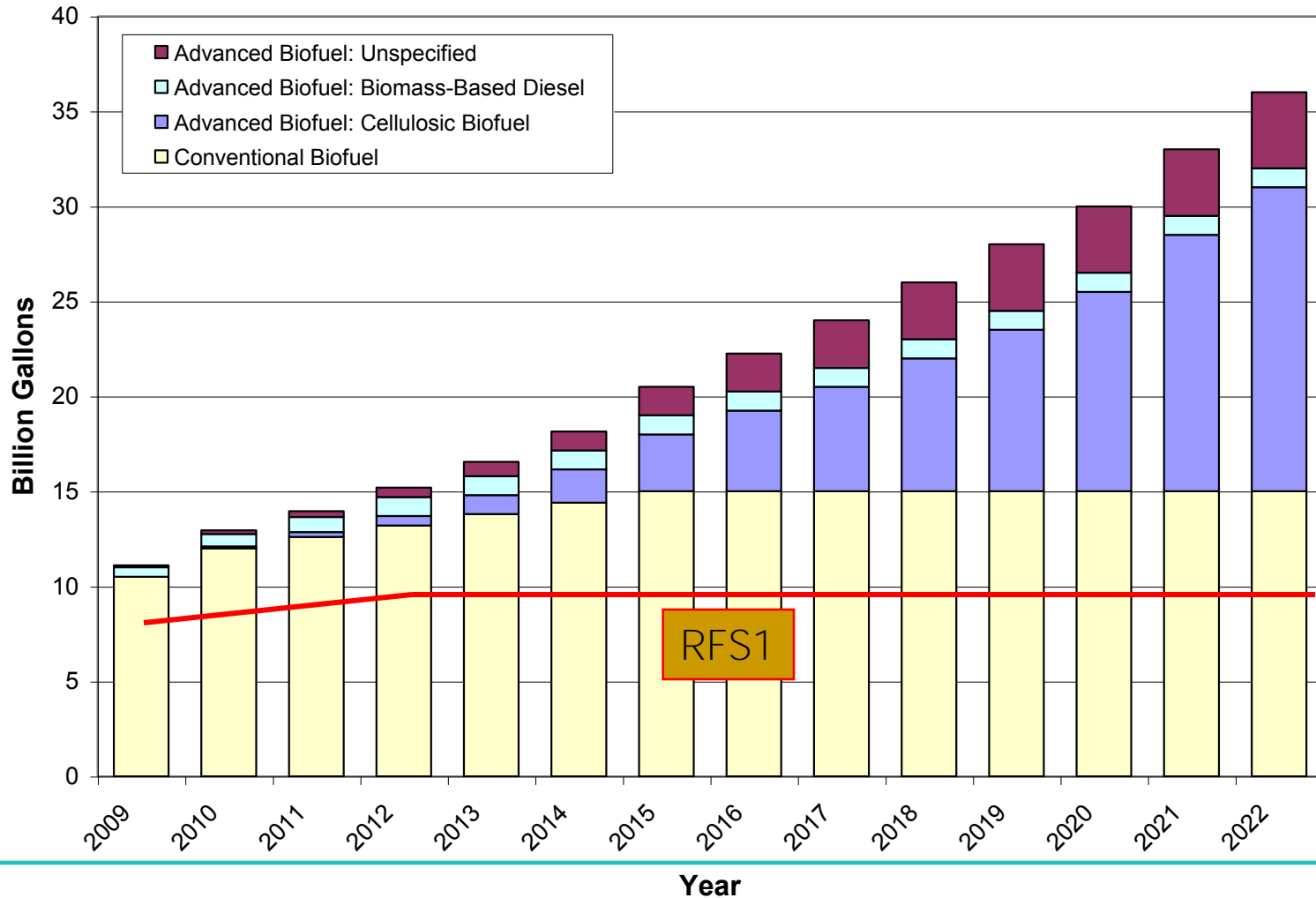
Agenda

- Background and statutory requirements
- Lifecycle impacts and GHG thresholds
- Other important provisions
- Impacts
- Next Steps

A Short History

- **On May 5, Administrator Jackson signed the Renewable Fuel Standard (RFS2) proposal**
 - Proposal interprets revisions to the original EPCRA RFS program, as included in the Energy Independence and Security Act (passed in December 2007)
 - Lays out these proposed changes, including alternative options, for public comment
- **Some of the revisions that are interpreted and discussed in the proposal include:**
 - Significantly increased volumes of renewable fuel
 - Separation of the volume requirements into four separate categories of renewable fuel: cellulosic biofuel, biomass-based diesel, advanced biofuel, total renewable fuel
 - Changes to the definition of renewable fuels to include minimum lifecycle GHG reduction thresholds
 - Restrictions on the types of feedstocks that can be used to make renewable fuel, and the types of land that can be used to grow feedstocks
 - Inclusion of specific types of waivers and EPA-generated credits for cellulosic biofuel

Increase Mainly From Cellulosic/Advanced Biofuel



New Standards

Four Separate Standards

- **Cellulosic Biofuel: 16 billion gallons by 2022**
 - Renewable fuel produced from cellulose, hemicellulose, or lignin
 - E.g., cellulosic ethanol, BTL diesel, green gasoline, etc.
 - Must meet a 60% lifecycle GHG threshold

- **Biomass-Based Diesel: 1 billion gallons by 2012 and beyond**
 - E.g., Biodiesel, “renewable diesel” if fats and oils not co-processed with petroleum
 - Must meet a 50% lifecycle GHG threshold

- **Advanced Biofuel: Minimum of 4 billion additional gallons by 2022**
 - Essentially anything but corn starch ethanol
 - Includes cellulosic biofuels and biomass-based diesel
 - Must meet a 50% lifecycle GHG threshold

- **Conventional Biofuel: Up to 15 billion gallons**
 - Ethanol derived from corn starch – or any other qualifying renewable fuel
 - Must meet 20% lifecycle GHG threshold
 - Only applies to fuel produced in new facilities

Existing biofuel facilities not required to meet conventional biofuel GHG threshold

EISA language permits EPA to adjust the lifecycle GHG thresholds by as much as 10% (60% to 50%; 50% to 40%; 20% to 10%)

- Based on the market availability of fuels that could count as advanced biofuel, we have proposed that the GHG threshold for advanced biofuel be adjusted to as low as 40%

Lifecycle Methodology and Results

Lifecycle GHG Emissions

- **Lifecycle GHG analysis is integral to the new RFS2 Standards**
 - Without a determination of whether a fuel does or does not comply with the thresholds, the program cannot be implemented

„The term „lifecyde 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.”

Lifecycle GHG Thresholds

- **GHG thresholds are defined as the % reduction in lifecycle GHGs for a renewable fuel in comparison to the 2005 baseline gasoline or diesel that it displaces**
 - Lifecycle GHG estimates are only used to categorize renewable fuels into the four standards, not to value them
- **We have conducted lifecycle analysis for a variety of renewable fuel pathways**
 - Additional analysis for final rule is expected to expand the list of pathways and revise input assumptions based on new information
 - Also proposing a "default" mechanism that would allow some renewable fuels to temporarily generate RINs even if we did not explicitly analyze their lifecycle GHG impacts
- **While each renewable fuel pathway has a unique lifecycle GHG emissions impact in grams/mmBtu, for RFS2 regulatory purposes these lifecycle emissions are used only to compare each pathway to the applicable threshold and assign it to one of the four renewable fuel categories**

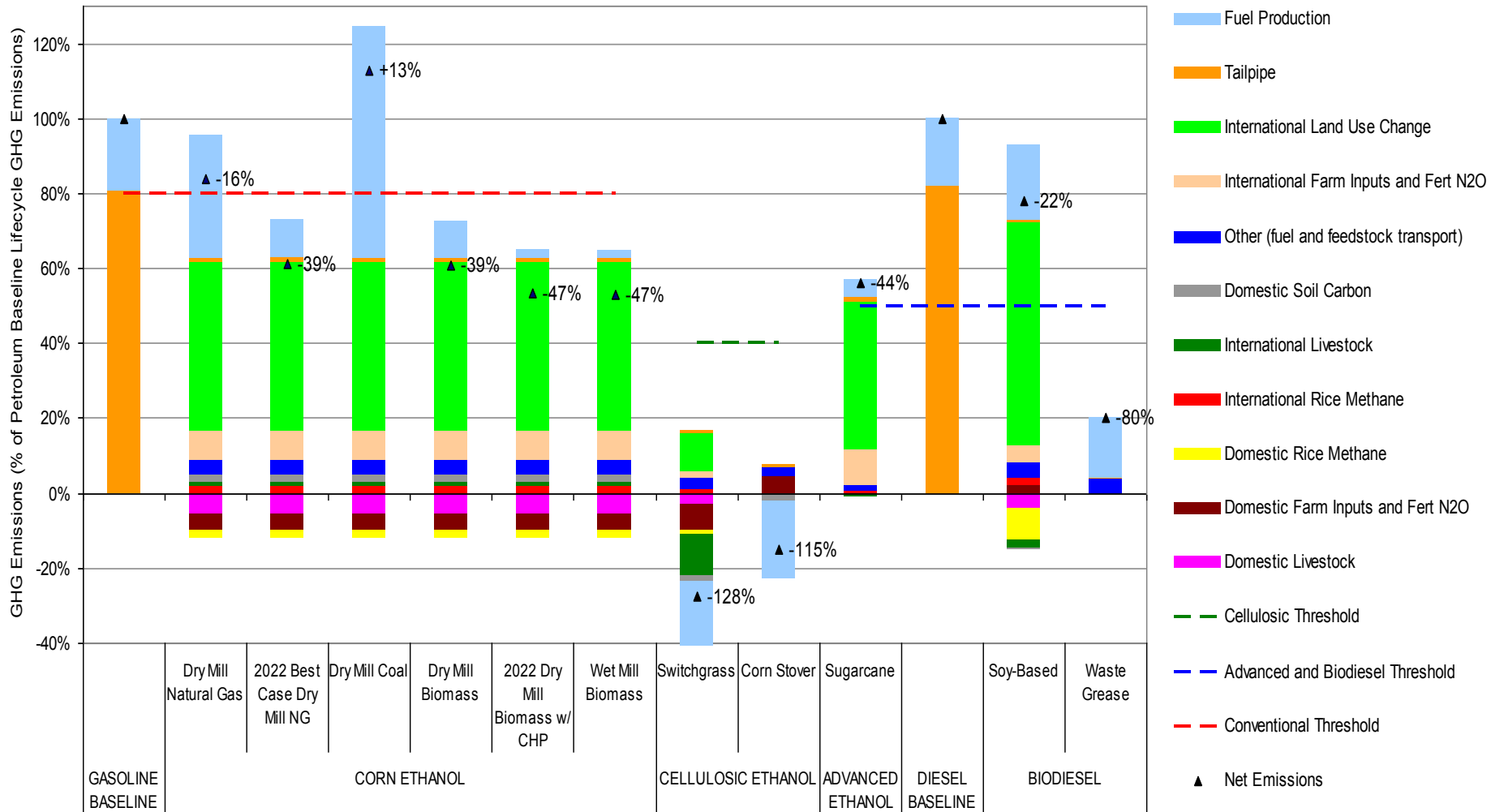
Key Factors in Land Use Assessment

- **Analysis revealed which factors have the most significant impact on the final results including:**
 - **What type of land is converted?**
 - Use of historic satellite data to project type of land converted
 - Alternative approach to use economic models to predict type of land converted
 - **What time period to consider and whether to apply a discount rate to emissions over time?**
- **We conducted additional sensitivity analyses around these and other factors**

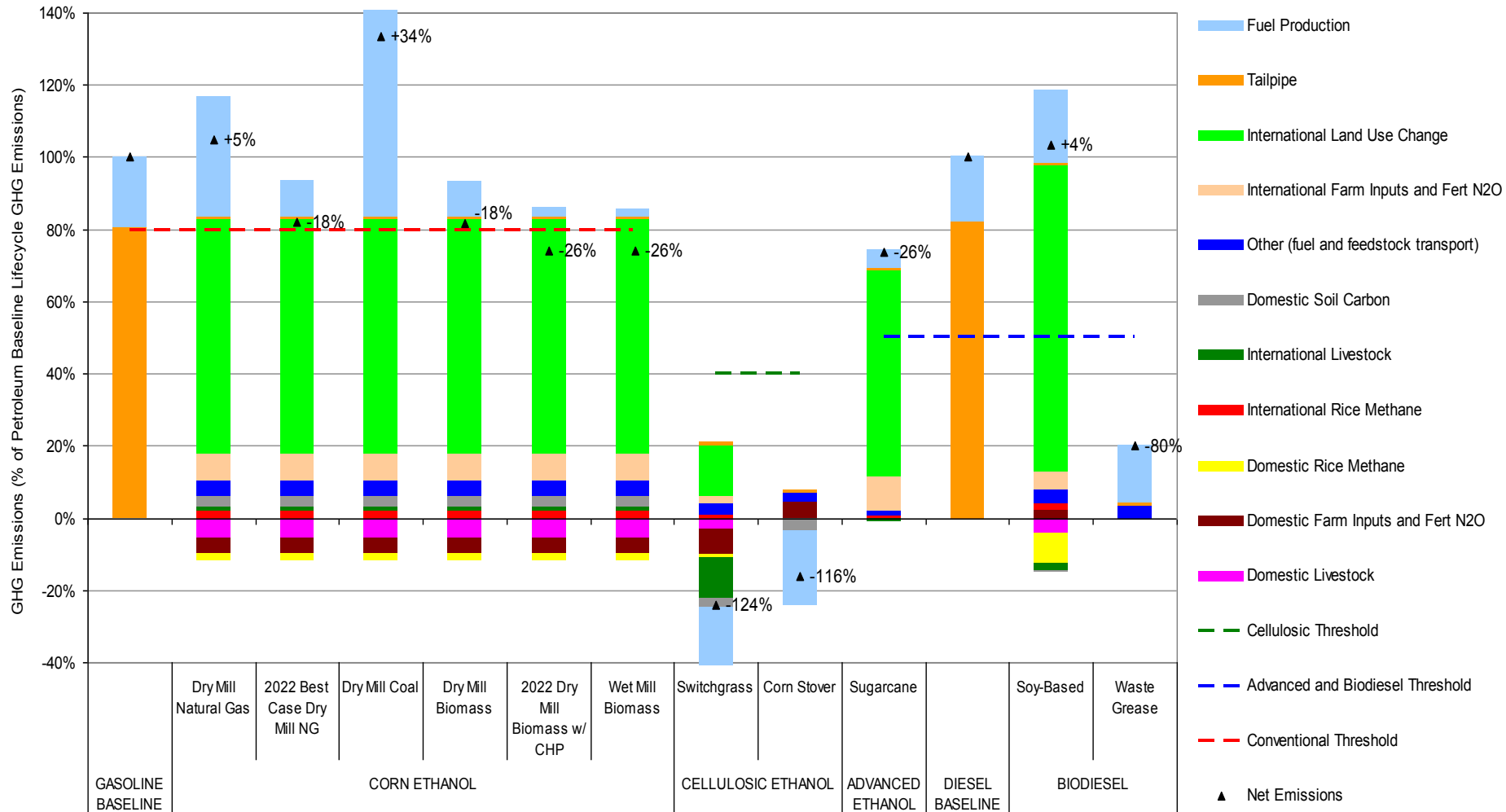
Presentation of LCA Results in the Proposal

- **Thorough description of our new methodology and results**
- **Acknowledges uncertainty, particularly for land-use change impacts**
- **Presents the results, along with various sensitivity runs**
 - Corn ethanol assessments for different volumes, different years
 - Different assumptions for land use impacts
 - Bracketing pasture replacement (zero to 100%)
 - Type of land converted (assume 100% grassland)
 - Impact of foregone sequestration over time
- **Likewise we present several options for valuing the impacts over time**

Biofuel Lifecycle GHG Results: *Different Pathways with 2% Discount Rate – 100 years (2022 Values)*



Biofuel Lifecycle GHG Results: *Different Pathways with 0% Discount Rate – 30 years (2022 Values)*



Other Key Provisions

Grandfathering

- **All biofuel facilities that “commenced construction” prior to EISA are grandfathered**
 - They are not required to meet the minimum 20% GHG threshold
 - Does not apply to other thresholds
- **We seek comment on a range of options based on input from stakeholders**
 - Protective of pre-EISA investments
 - Level playing field for future investments
 - Practical implementation (avoid NSR-like issues)
- **Main proposal is to grandfather a baseline volume for each facility**
 - Baseline volume would be grandfathered forever
 - Expansions would be tracked like new facilities
- **We expect at least 15 bill gal will be grandfathered**
 - All current corn-ethanol production volume
 - All current biodiesel production volume
 - All current sugarcane ethanol production volume

Renewable Biomass Provision

- **EISA restricts the types of renewable fuel feedstocks and land that feedstocks can come from. For example:**
 - Agricultural land must have been cleared or cultivated prior to Dec 19, 2007 and actively managed or fallow, and non-forested
 - Woody biomass from federal land is not allowed, except from wildfire areas
- **EISA language does not prohibit a “shell game” in which food crops are moved to new ag land while existing ag land is used for fuel feedstocks**
- **Requires new tracking of feedstocks from point of production to renewable fuel producers**
 - Applies to both domestic and foreign producers
- **We are proposing that renewable fuel producers would be required to maintain records to support their decision to generate or not to generate RINs for a given batch of renewable fuel**
 - Renewable fuel producers would be expected to work out a system with their feedstock supplier(s) to ensure they generate RINs only for fuel produced from feedstock that meets the definition of “renewable biomass
 - The practical implication is that producers would establish tracking systems up through their supply chain
 - Other options include relying on third-party verification and use of satellite imagery

Waivers for Cellulosic Biofuel

- **Irrespective of the volumes of cellulosic biofuel required in EISA, EPA is required to determine the standard for the following year based on projections of production**
 - We "may" reduce the advanced biofuel and total renewable fuel standards accordingly
- **We are proposing annual Production Outlook Reports for all renewable fuels through which renewable fuel producers will give us their expansion and new construction plans**
 - We expect to conduct a notice-and-comment rulemaking each year for setting the standards using information from the Production Outlook Reports
 - For 2010 we are proposing that the full 0.1 bill gal requirement from EISA be used as the basis for the standard
- **If the projected volume is less than the EISA volume, we must make cellulosic biofuel credits available up to the level of the standard set for that year**
 - Price is set by EISA as greater of 25¢ or \$3 - wholesale price of gasoline, adjusted for inflation
 - We are proposing that credits ("allowances") only be made available to obligated parties at the time of their compliance demonstration

Impacts

RFS2 Impacts Summary

■ GHG Emissions from Transportation

- Reductions of 6.8 billion tons of CO2 equivalent (or approximately 160 million tons per year)
- Reductions equivalent to taking about 24 million vehicles off the road.

■ Impacts on Overall Petroleum Consumption in 2022

- 36 billion gallons of renewable fuel will increase renewable fuel usage by approximately 22 billion gallons over 2022 base volume scenario
- This will displace about 15 billion gallons of petroleum-based gasoline and diesel fuel.
- This represents about 11% of annual gasoline and diesel consumption with most reductions coming from reduced imports of petroleum.

■ Fuel Cost Impacts (Nationwide Average based on low and high crude costs)

- Gasoline costs would increase by about 2.7 and 10.9 cents per gallon by 2022.
- Diesel fuel costs could experience a small cost reduction of 0.1 cents per gallon, or increase by about 1.2 cent per gallon
- Increases in gasoline and diesel fuel costs are equivalent to \$4 billion to \$18 billion in 2022

■ Energy Security

- Estimate, the total energy security benefits associated with a reduction of U.S. imported oil is \$12.38/barrel.
- Based upon the \$12.38/barrel figure, total energy security benefits associated with this proposal were calculated at \$3.7 billion

■ Consumer Food Costs

- Estimate U.S. food costs would increase by \$10 per person per year by 2022
- Net U.S. farm income would increase by \$7.1 billion dollars (10.6%).

Next Steps

Comment Period/ Workshop

- **60-day public comment period will commence following publication of proposal in the Federal Register**
- **Public hearing on proposal planned for June 9 in Washington, DC**
- **Two-day lifecycle workshop (June 10-11 in Washington, DC)**
 - The intent of this workshop is to help ensure a full understanding of our lifecycle analysis, the major issues identified, and the options discussed
- **Planned peer reviews of lifecycle methodology**

Formal Peer Review

- **Conducting a formal peer review (between proposal and final rule) of key elements of our lifecycle analysis:**
 1. Land use modeling (use of satellite data/ land conversion GHG emission factors)
 2. Our estimates of GHG emissions from foreign crop production
 3. Methods to account for the variable timing of GHG emissions
 4. How the models we've relied upon are used together to provide overall lifecycle estimates
- **We are following EPA peer review guidelines (developed by an internal advisory group in order to ensure consistent Agency-wide implementation of peer review).**
 - EPA's guidelines also incorporate OMB's government-wide peer review bulletin
- **In accordance with this guidance, we are using an independent, third-party contractor to conduct an external peer review**
 - Contractor identifies list of expert reviewers, checking for possible conflict of interest
 - Also conducts meetings, teleconferences, etc, in order to clarify technical components of the product and develops the peer review record
- **The peer review record will be available to the public, including:**
 - Materials provided to the peer reviewers
 - List of names and affiliations of the peer reviewers
 - Summary of comments, as well as comments attributable to individual reviewers
- **Timeframe**
 - The plan is for the peer reviews to be completed by the end of June; experts have at least one month to complete their review