



Department of Environmental Quality

Low Carbon Fuel Advisory Committee
December 3, 2009

**Low Carbon Fuel Standard
Economic Analysis**

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Department of Environmental Quality

**Low Carbon Fuel Standard: Economic
Analysis**

Purpose:

- **Evaluate the costs and savings associated with a low carbon fuel standard**
- **Evaluate the impact of a low carbon fuel standard to:**
 - Cost of transportation fuel
 - General public
 - Businesses
 - Governments

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Advisory Committee Questions

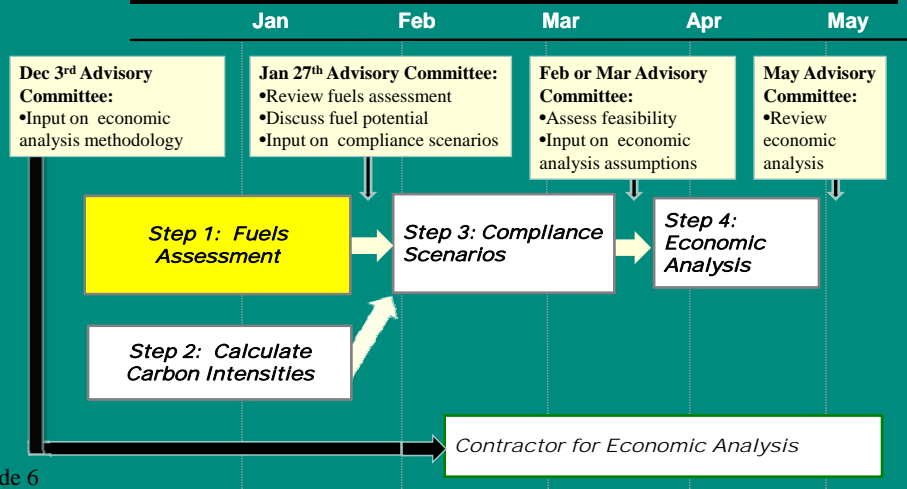
1. Is there additional input you would like to have?
2. Is the economic analysis trying to answer the right questions?
3. Do you recommend any changes in the proposed:
 - Steps 1-3 leading up to an economic analysis
 - Economic analysis methodology?

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Step 1: Fuels Assessment

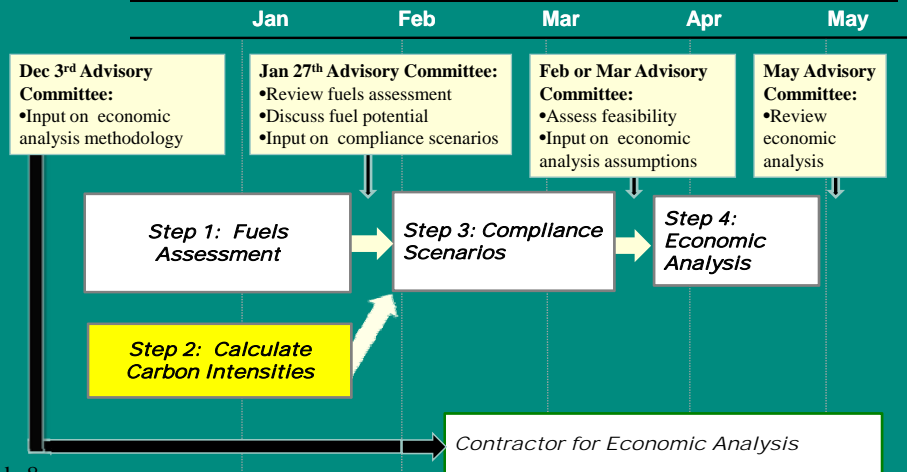
- Current and potential OR fuel production
- Out of state production
- Technology description and commercialization status
- Regulatory context:
 - Federal Renewable Fuel Standard
 - Oregon Renewable Fuel Standard
 - Portland Renewable Fuel Standard

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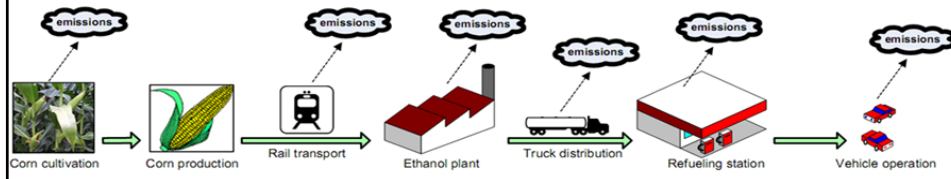


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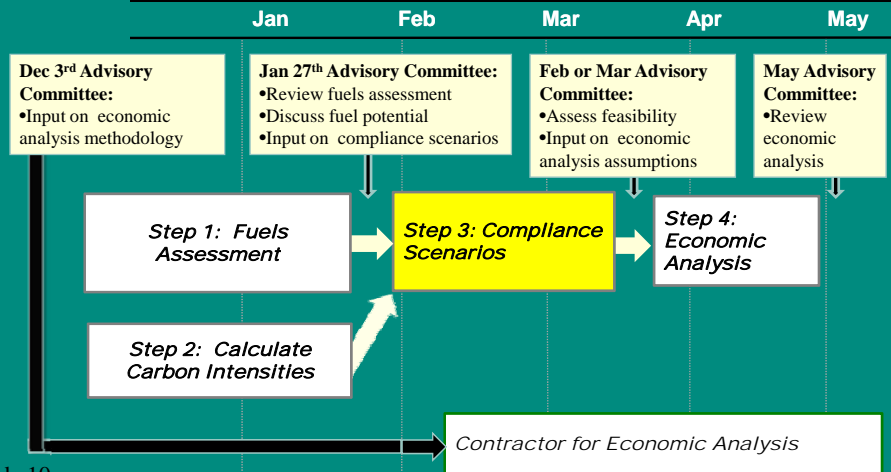
Step 2: Calculate Carbon Intensities (Lifecycle Analysis)

- Analyze the lifecycle CO2 equivalent emissions
- Includes:
 - Obtaining feedstock
 - Storage
 - Transport
 - Distribution
 - Production
 - Use



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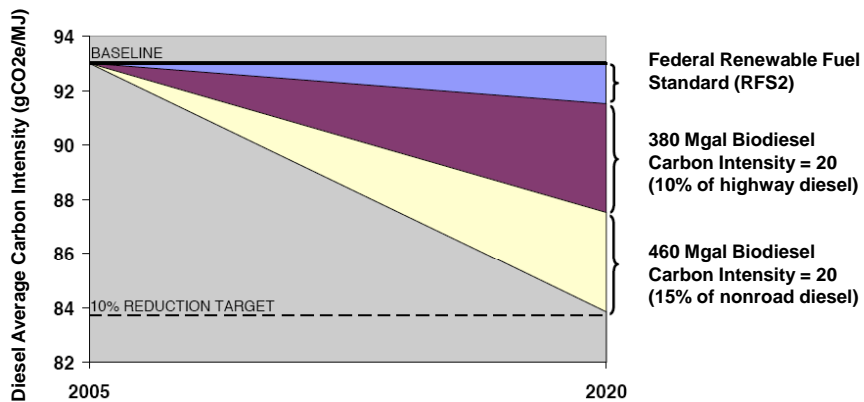
Step 3: Compliance Scenarios

- LCFS compliance can be achieved with a number of different fuels
- Increase the use of different types of low carbon fuels in the overall fuel mix
- Several different compliance scenarios – a tool for assessing volumes of LCF and feasibility

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Compliance Scenarios - Example

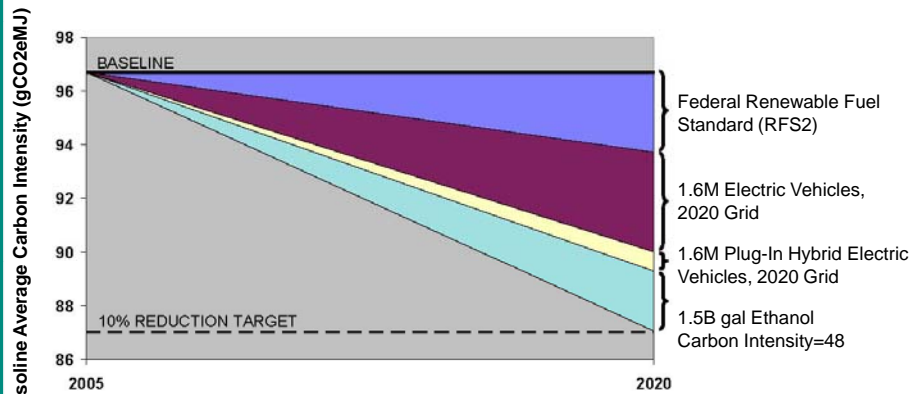


Example Diesel Compliance Scenario #D1 from East Coast States

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Compliance Scenarios - example

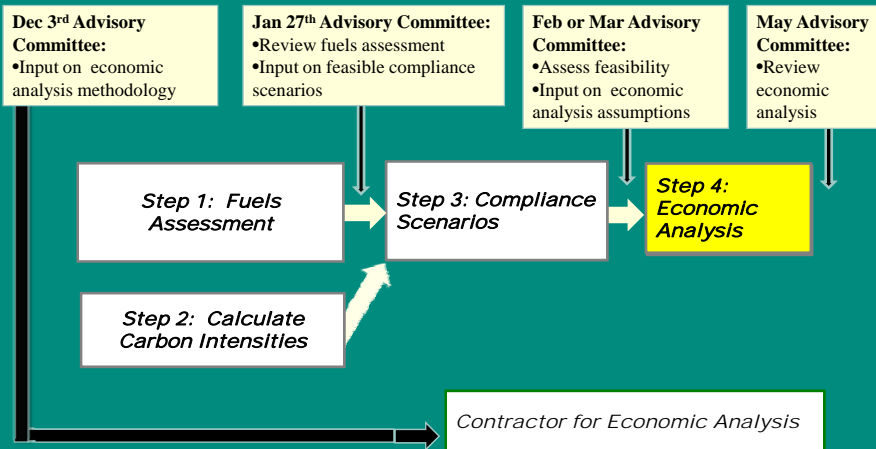


Example Gasoline Compliance Scenario #G2 from East Coast States

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Economic Analysis



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Economic Impact Analysis – What does it mean?

- **Assessment of policy change across entities, region or economies**
 - adoption of regulation
 - new investment
 - tax cut
- **Used by federal agencies and states**
- **For LCFS compliance:**
 - A comparison of the costs of “Business-As-Usual” versus the costs of complying with LCFS
 - Many different ways a LCFS could be met
 - Assess range of costs associated with each compliance scenario

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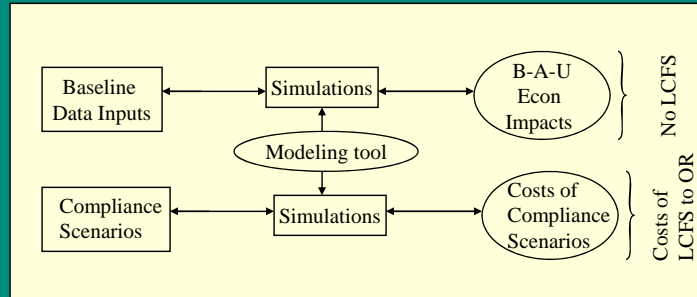
Economic analysis – What does it contain?

- **Goal: Net Compliance Costs (Year 1 to X) = (Total costs - Cost Savings) ; where X = final year of compliance**
- **Typical method to estimate economics of a policy change (public and private sector)**
- **Affected parties-**
 - Transportation fuel providers and distributors
 - General public, businesses, governments
 - Small businesses

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Flowchart of typical analysis



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Method and Tool – Impact Analysis

- **Impact analysis is best done using regional economic modeling – 2 tools available**
- **REMI (Regional Economic Modeling Inc.) – widely used for a variety of policy changes (e.g., tax cut / hike, climate change, education and health policies, welfare programs, etc.)**
- **IMPLAN – Similar tool but not dynamic**

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Recommended tool – REMI (<http://www.remi.com>)

- A dynamic tool: accounts for changes in fuel prices, market conditions and trade
- Designed to model year-by-year economic impacts across states and industries
- Can be modeled to capture “geographical location” - assess physical location or clustering of resource use / production
- Data sources for modeling: Federal and other established published sources

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Approach & Components – Economic Analysis

Components:

- Net (Costs / Benefits) of compliance = (Costs of producing petroleum fuels + costs of alternative fuel sources) – (cost savings from increased total fuel supplies and revenue impacts to region)
- Then we compare: Costs of (Baseline vs each Compliance Scenario)
- Evaluate a range of “net cost” scenarios

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Steps in an Economic Analysis

Estimate net costs of:

- **Step A: producing gasoline and diesel**
- **Step B: producing each low carbon fuel**
- **Step C: each compliance scenario**
- **Step D: Estimate net costs for Oregon consumers**
 - Impact on cost of transportation fuel
 - Impact to general public, businesses, governments
 - Cost of compliance for small business

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Desired Outcomes

- **Net cost of low carbon fuel standard**
- **Possible economic benefits of increased alternative fuels**
- **Estimated net costs for Oregon consumers**
 - Impact on cost of transportation fuel
 - Impact to general public, businesses, government
 - Impact to small business

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Advisory Committee Input

- Overall approach design
- Data Inputs
- Modeling assumptions
 - technology and resource availability
 - time lag
 - fuel consumption patterns
 - market conditions
- Sensitivity runs
 - prices (fuel, feedstock)
 - Investment Interest rate
 - technology-fuel mix

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Advisory Committee Questions

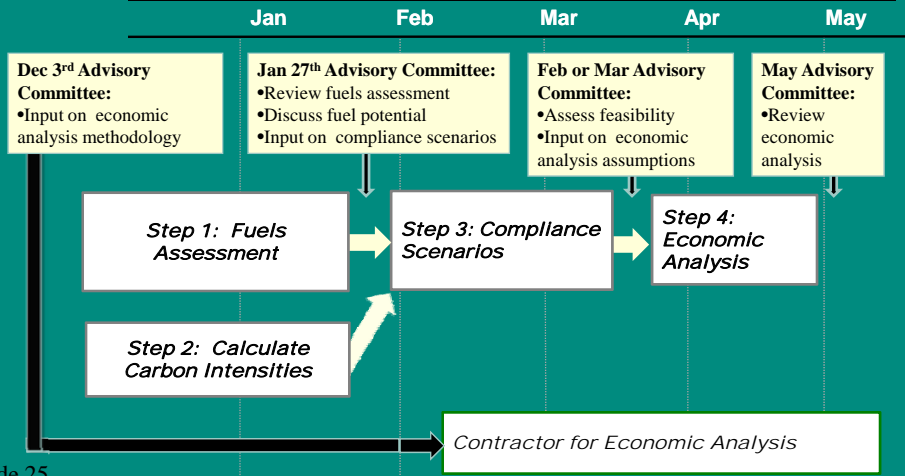
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