



Oregon LCFS: Economic Impacts

August 10, 2010



Today's Discussion

- Micro Economics
- Macro Economics
- Fuel Demand & Prices
- Vehicle Demand & Prices
- Modeling Tools
- Forecasting vs Scenario Analysis

Who Am I

- Mike Lawrence, President, Jack Faucett Associates
- Energy & Transportation Economist
- Support Federal, State and Local Decision Makers
- Experienced in Western States and Oregon Energy & Transportation Policy

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Why Am I Here

- 35 Years of Experience In Energy and Transportation Policy
- Measured Economic Impacts of Transportation Carbon Policy Across US
- Experience in Converting Policy Into Micro Economic Impacts and Macro Economic Impacts

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Goal of the Project

- Understand How Selected LCFS Pathways Impact Fuel and Vehicle Sales and Use
- Translate These Micro Impacts Into Macro Economic Impacts In Oregon
- Learn How Different Pathways and Assumptions Change the Results

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Tools For LCFS Analysis

- GREET – Carbon Factor Analysis (TIAX)
- VISION – Perpetual Vehicle Inventory and Micro Impacts (TIAX & JFA)
- VISION to MACRO – Translate Micro VISION Outputs Into Macro Model Inputs (JFA)
- REMI PI+ - Premier Macro Economic Model Available (REMI Northwest, Adam Rose USC)

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VISION Model

- Developed By Argonne National Lab/DOE
- Database and Projection of the Vehicle Fleet Including Vintage, Technology, Efficiency, VMT
- Key Inputs – EIA AEO Forecasts, LCFS Pathway Design, Fuel/Vehicle Technology
- Key Outputs – Future Fleet Composition by Technology, Efficiency, Fuel Type and MPG

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VISION to Macro (VtM)

- Developed by JFA
- VISION Provides Changes in Fuel and Vehicle Sales Based on Selected Pathway These are Micro Impacts
- VtM Develops the Direct Macro Impacts Associated With Micro Changes Such As Capital, Equipment, Distribution, etc.

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Measuring Macro Impacts of LCFS

- Decreased Demand for Petroleum
- Increased Demand for Alternative Fuels
- Increased In-State Fuel Production
- Increased Capital Investment
- Changes in Household/Commercial Expenditures

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Macro Impacts Example: More Consumption of In-State Biofuels

- Impacts Felt Across the Economy:
 - Forestry Sector incomes rise
 - Agriculture Sector incomes rise
 - Household & Commercial Expenditures change
 - Petroleum Expenditures fall
 - Actors in Each Sector Change Behavior

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Macro Impacts Example: A New Ethanol Plant

■ Construction

- Capital Spending, Plant & Equipment → Supply Industries Expand
- Labor Spending (Construction Workers, Engineers, Architects) → Consumer Income → Consumer Spending
- Fuel Expenditures

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Macro Impacts Example: A New Ethanol Plant

■ Operations

- Water Consumption
- Feedstock Consumption → Agriculture Sector Income
- Labor Spending → Consumer Income → Consumer Spending

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REMI Policy Insight Plus (PI+)

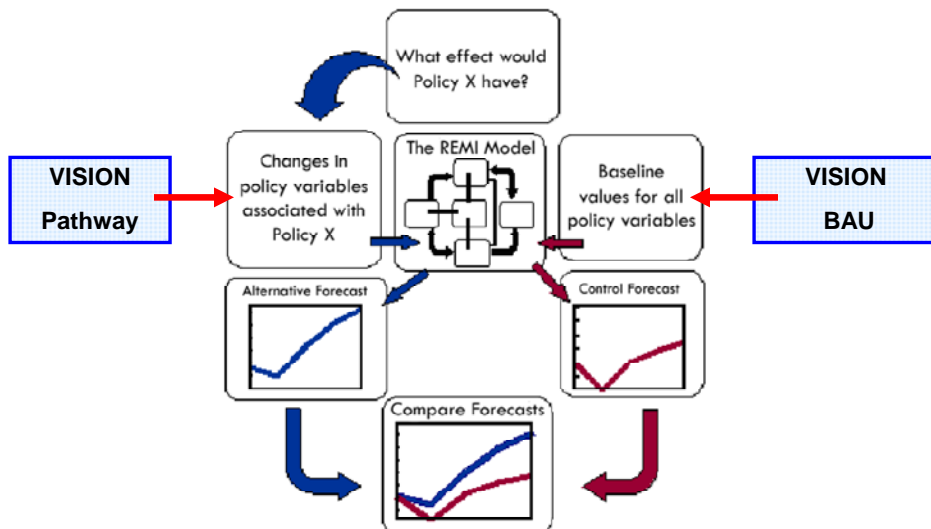
- Developed by Regional Economic Models, Inc.
- Includes Input/Output (I/O) Model, Computable General Equilibrium (CGE) Model, Economic Geography (EG) Model
- Provides Change in State Product, Value Added, Output, Employment, Income, etc.

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REMI PI+ Analysis of LCFS



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Forecasting vs. Scenario Analysis

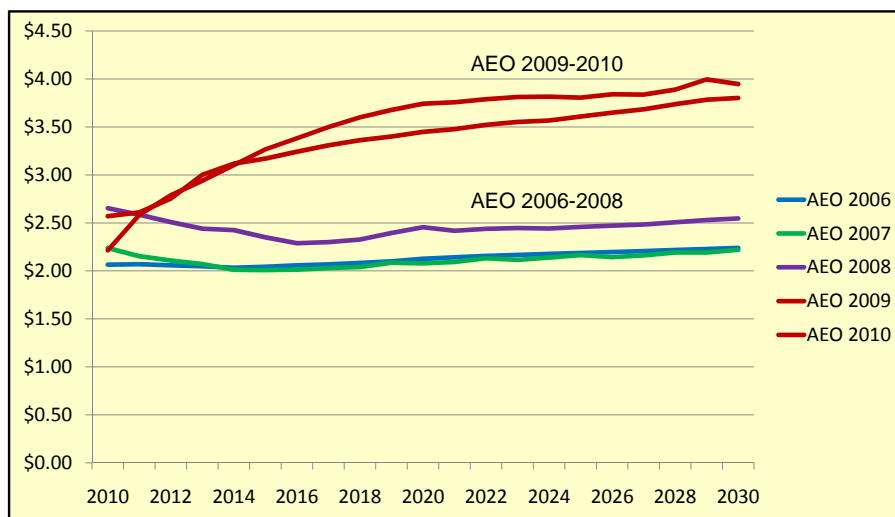
- This is Not a Forecasting Project
- Economic Forecasts Beyond Five Years are of Little Value, So We Select a Reasonable Baseline
- We are Not Good At Predicting Future Economic Levels for Specific Years
- Scenario Analysis Measures the Change from The Baseline

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AEO Gas Price Forecasts Vary

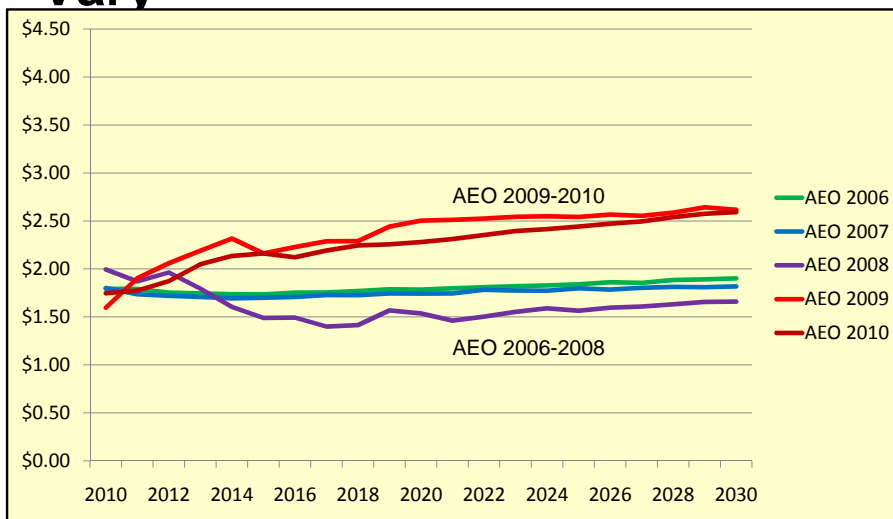


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AEO Ethanol Price Forecasts Vary

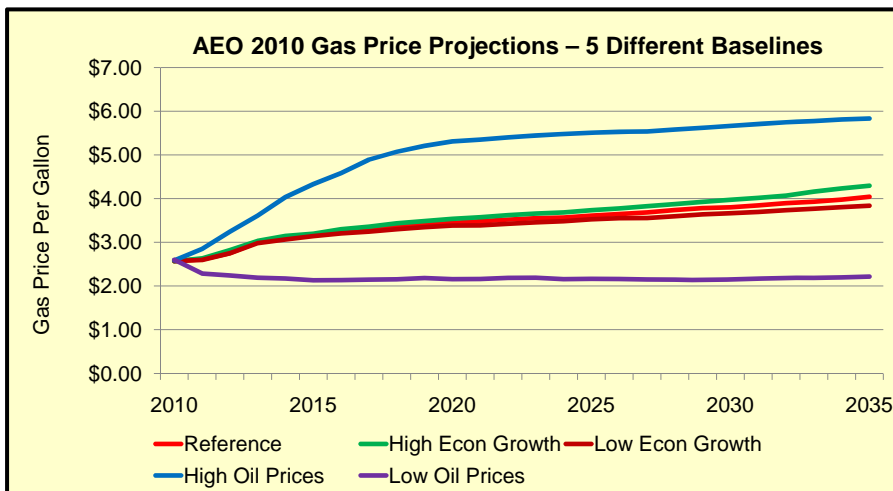


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Growth and Oil Price Assumptions Determine Gas Price Projections

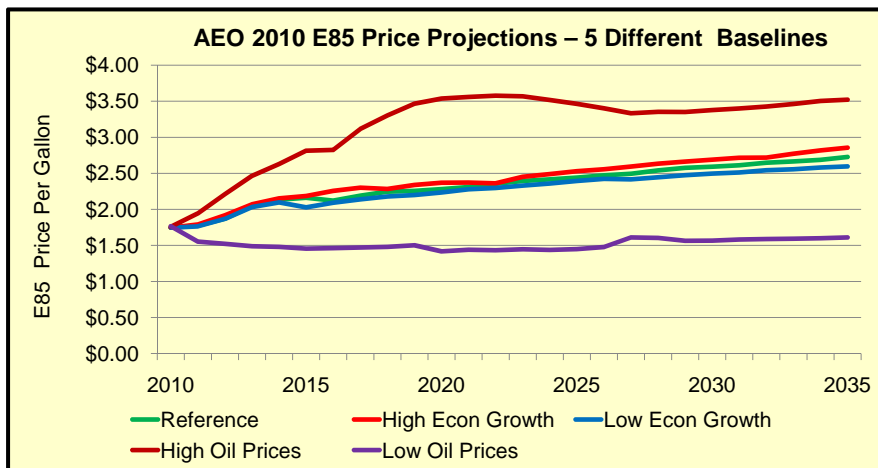


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E85 Prices are Similarly Sensitive to Assumptions



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Key Assumptions

- Fuel Prices
- Fleet Efficiency
- Conversion Factors
- New Capital Spending:
 - Equipment
 - Materials
 - Infrastructure

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Next Steps

- Receive VISION Analysis of Alternative Pathways from TIAX
- Convert Micro Impacts from VISION (Fuel & Vehicles) to Macro Model Inputs
- Run REMI PI+ for Each Scenario
- Evaluate the Macro Model Results

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Discussion Session

Michael F. Lawrence, President



Phone: (301) 961-8835

Email: Lawrence@jfaucett.com

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