



# National Low Carbon Fuel Standard

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**House Briefing (Capitol Visitors Center)**

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# 2-year Collaborative Study



Carnegie Mellon University  
International Food Policy Research  
Oak Ridge National Laboratory  
University of California, Davis  
University of Illinois, Urbana-Champaign  
University of Maine

- Two reports
    - Policy Design Recommendations
    - Technical Analysis
  - Seven peer-reviewed papers
  - Funded by Energy Foundation and William & Flora Hewlett Foundation
- *We are not here to advocate. We are providing scientific foundation and policy template. We will continue to provide technical assistance and public education to all interest groups.*

# Urgency in Addressing Transportation Energy Challenges



- Energy Security
  - Oil imports cause huge economic losses
  - 2/3 of oil used for transportation (in US)
  - High and volatile fuel prices affect business and consumers
- Climate Change
  - 1/3 of GHG emissions are from transportation (in US)

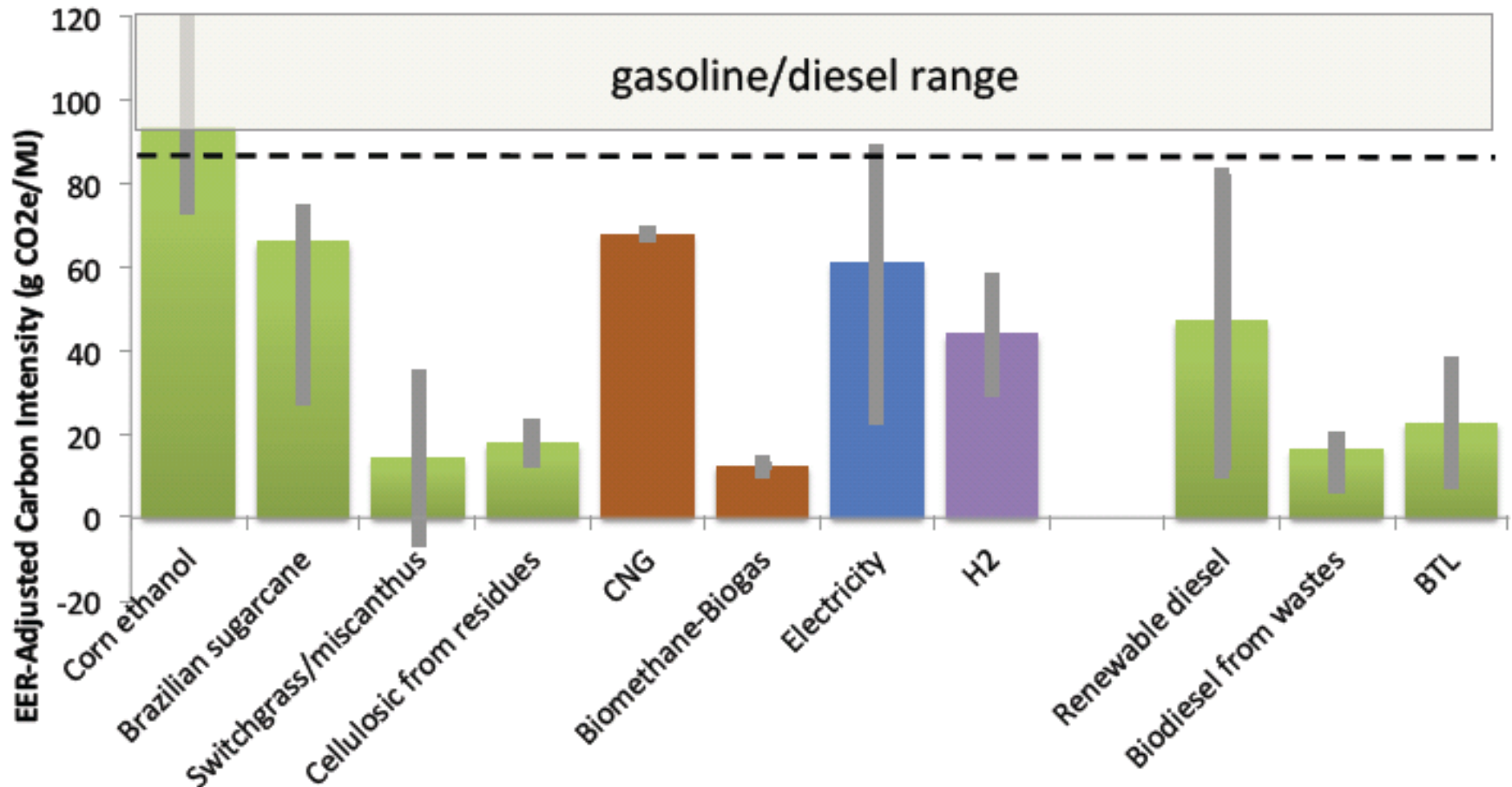


# Fuel du jour Phenomenon

- 30 years ago – Synfuels (oil shale, coal)
- 25 years ago – Methanol
- 20 years ago – Electricity (Battery EVs)
- 10 years ago – Hydrogen (Fuel cells)
- 5 years ago – Corn ethanol (Biofuels)
- Today – Electricity
- What's next?

*Without policy intervention, we'd start all over with unconventional oil*

# Many Options to Greatly Reduce GHG Emissions (to innovate!)



# What is LCFS?



- ***Objective is to stimulate innovation in low-carbon alternative fuels***
- Performance based: “Carbon” intensity target for transport fuels
  - Technologically neutral
  - Does not pick winners and losers
- Harnesses market forces
  - Allows trading of credits among fuel suppliers
- Lifecycle measurement of carbon intensity
- Includes biofuels, electricity, natural gas, hydrogen, and others

# LCFS Builds on RFS



- LCFS includes all transportation fuels (electricity, NG, H2, etc), including biofuels
- Performance-based standard (instead of fixed categories) stimulates innovation
  - Rewards cellulose at corn-ethanol facilities
  - More incentive to use waste materials
  - More incentive to reduce carbon footprint of oil sands
- Price caps and other “safety valves” (instead of waivers to oil companies)
  - Protects companies and consumers from price spikes
  - Provides regulatory certainty to companies
  - Encourages investment



# Large Economic Benefits

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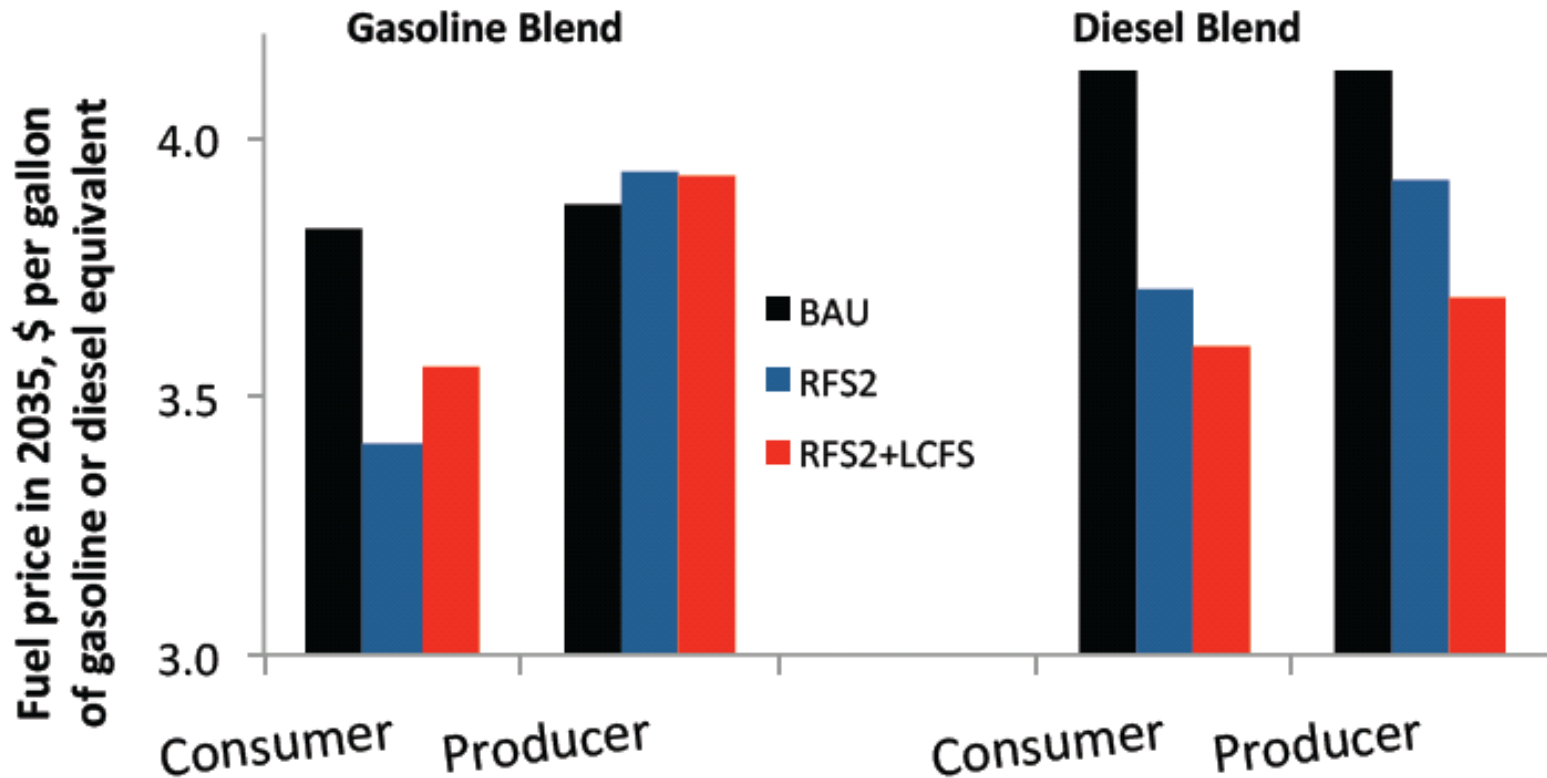


# Key Economic Findings of LCFS



- Reduces oil prices
- Lowers crop prices
- Net benefits to consumers from lower food and fuel costs is \$318 billion 2007-2035

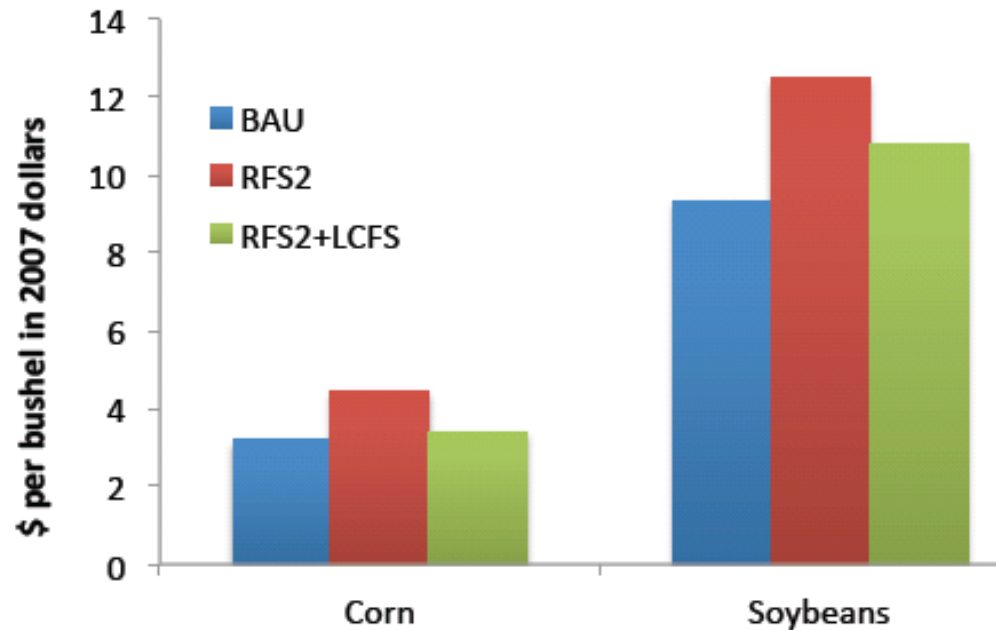
# Fuel Price Impacts



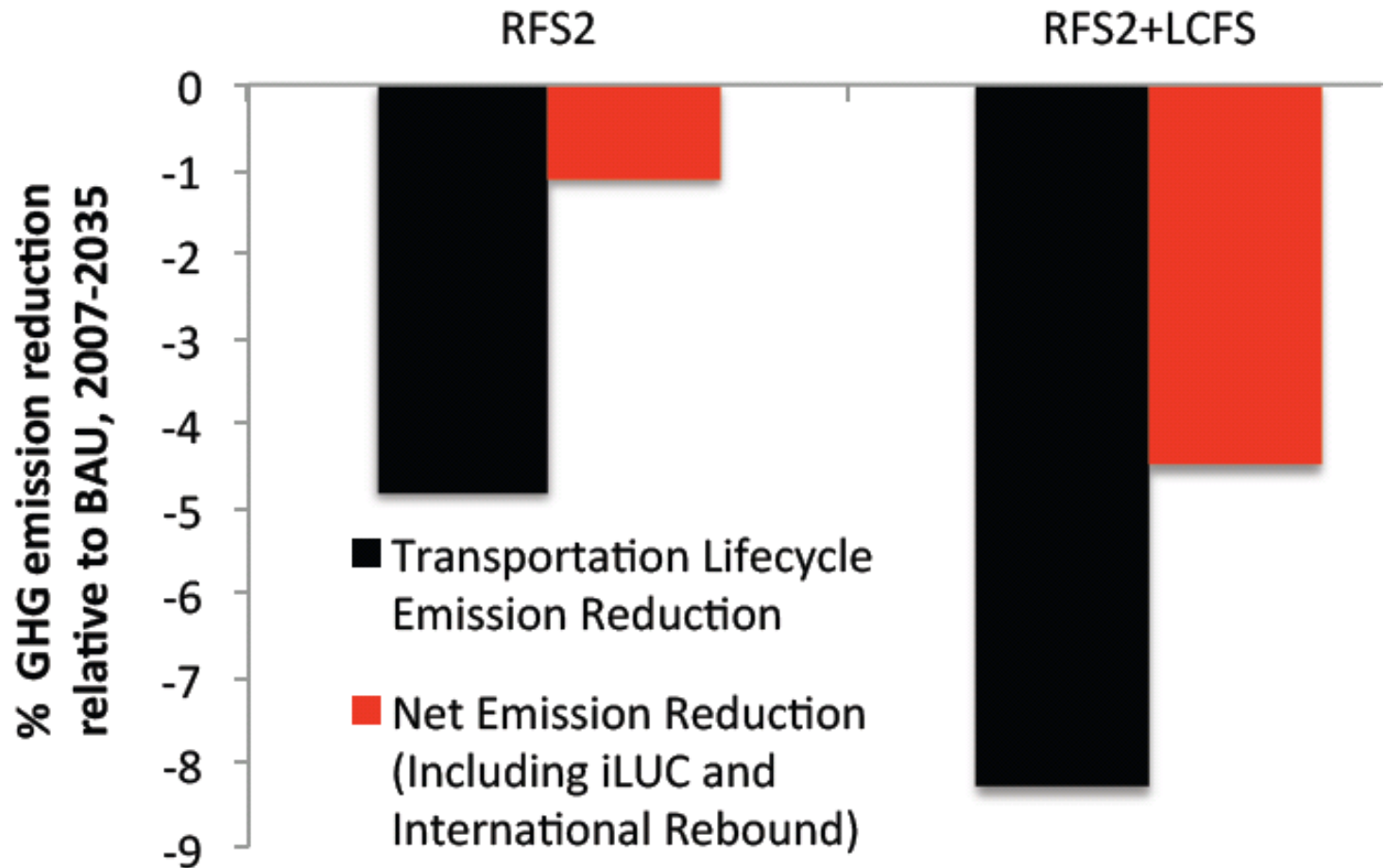
# Lower Food Prices With LCFS



- Shift from food-based crops for biofuel production to greater reliance on cellulosic material



# Lower GHG Emissions





# Large Energy Security Benefits

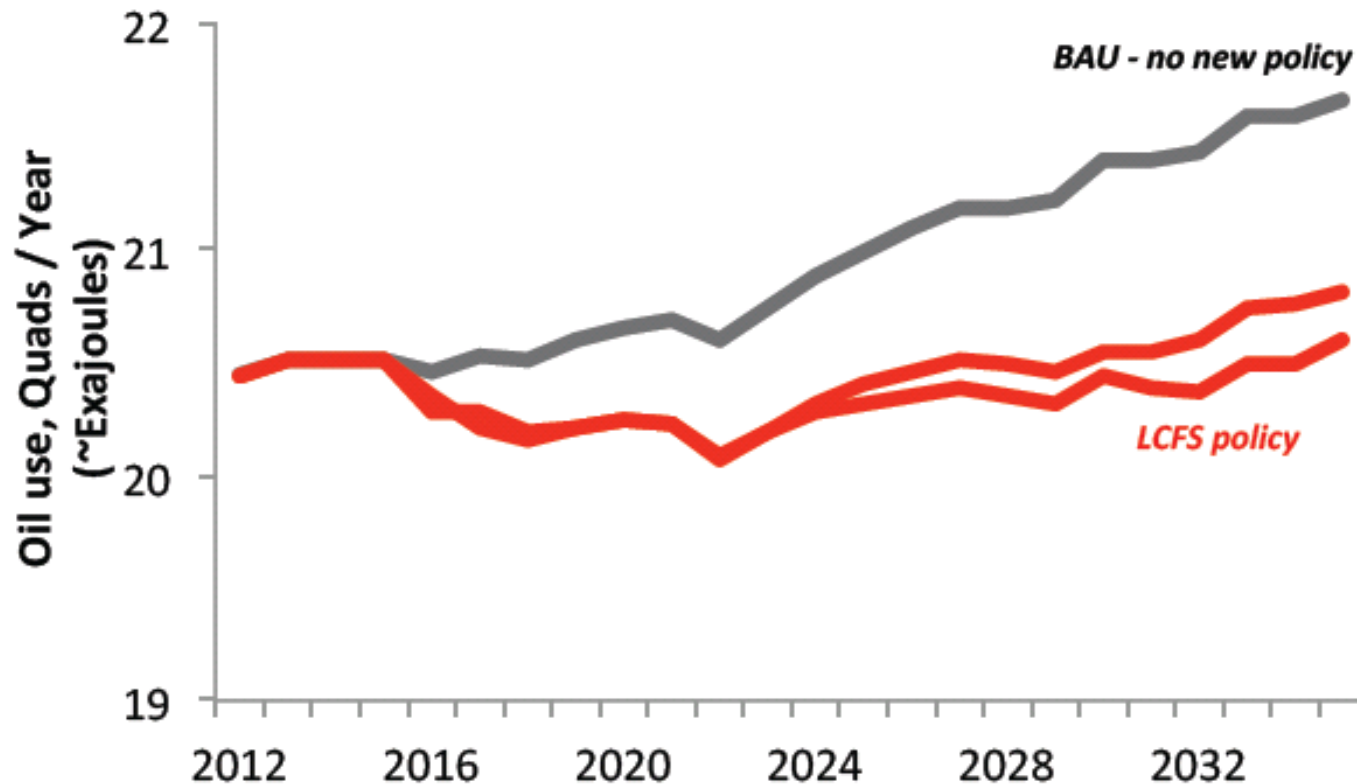
Paul Leiby

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# LCFS Reduces Oil Use and Improves Energy Security



# Energy Security Benefit of \$5-\$22 per Barrel



- Closer to \$22 if imported oil is displaced
- Closer to \$5 if North American oil is displaced
  
- Oil sands will continue to expand
  - Their carbon footprint will be reduced
  - Producers can also purchase LCFS credits



# Market Design Can Reduce Cost and Uncertainty

Prof. Jonathan Rubin  
School of Economics  
University of Maine



# Credit Trading Reduce Costs



- Trading and banking significantly reduce costs
  - Banking and trading reduce LCFS credit prices by 6-98%

# How to Avoid Price Spikes



- Price caps on LCFS credits (“safety valves”) can protect companies and consumer against price spikes



# Land Use Change From Biofuels (and Oil Sands) Can Have Large Impact on GHG Emissions

Dr. Sonia Yeh, University of California, Davis

Dr. Siwa Msangi, International Food Policy Research Institute

# Land Use Change (LUC) Can Cause Large GHG Emissions



- Biofuels cultivation requires additional land
- Additional land use results in high GHG emissions
- Some biofuels cause less LUC than others
  - Food crops require most land
  - Cellulosic (grasses and trees) require less land and thus have smaller impact
  - Waste material has no LUC effect

# Nuanced Policy Approach to Reduce LUC Effect (and GHG Emissions)



- Adopt complementary LUC policies
  - Encouraging low/no LUC feedstock (short-term)
  - Incentivize broader measures reducing LUC risk beyond biofuel sector (long-term)
- Assign ILUC factors to each biofuel pathway
  - Getting the “right value” is less important than getting a “reasonable value”
  - Sends important signal

# LCFS is Spreading



- **California** adopted LCFS April 2009, took effect Jan 2010
- **European Union** amended “Fuel Quality Directive,” sets 6% carbon intensity reduction target (2009)
- **British Columbia** implemented “Renewable and Low-Carbon Fuel Requirement Regulation, RLCFRR” (Jan 2010)
- **Oregon** currently in rulemaking phase
- **Washington and Northeastern and mid-Atlantic states** exploring LCFS-like policies (“clean fuel standards”)
- Early version of Waxman-Markey climate bill contained an LCFS

# LCFS Seems Best Policy Framework For Moving Forward



- Applies to all transportation fuels (not just biofuels)
- Does not pick winners
  - Important because future technology and costs are uncertain
- No cost to taxpayers
- Stimulates innovation and investment
- Large energy security benefits (\$5-\$22/barrel)
- Potentially large benefits to consumers (lower fuel and food prices) (~\$318 billion 2007-2035)
- Large reductions in GHG emissions
- Can be used to strengthen and broaden RFS