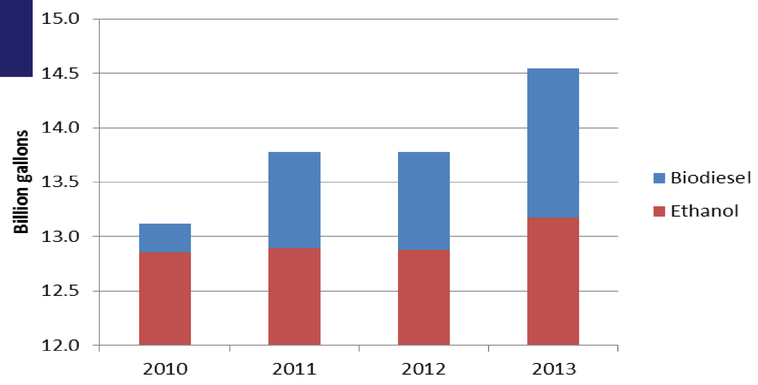
Emerging Biofuel Pathways in Policy (2 projects)

Julie Witcover, Lew Fulton
Institute of Transportation Studies, University of California, Davis – *May, 2015*

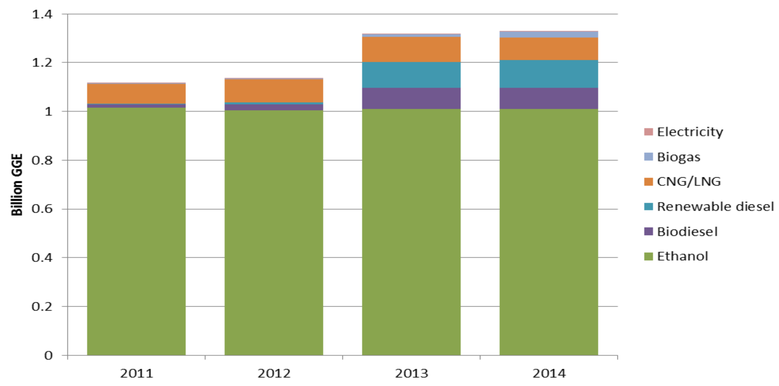
BIOFUEL LANDSCAPE…

Alt fuel use shifting…

US

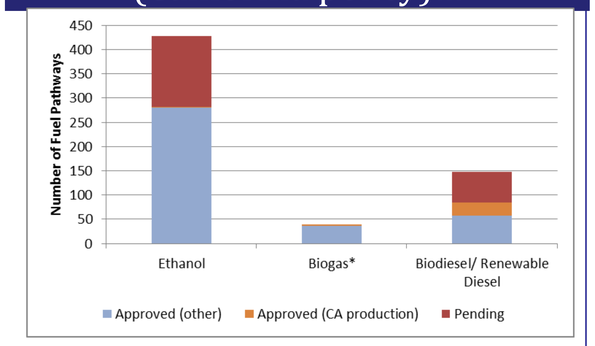


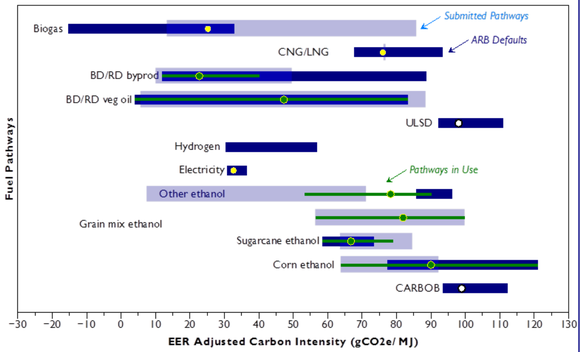
CA



Sources: EIA (top) and California Air Resources Board (bottom)

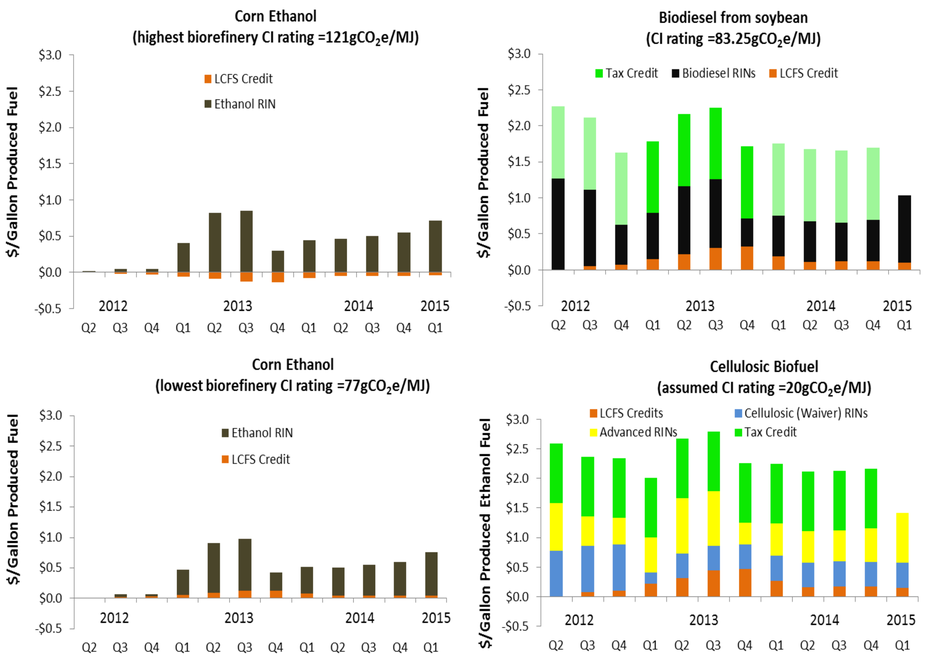
More fuel pathways (California policy)…





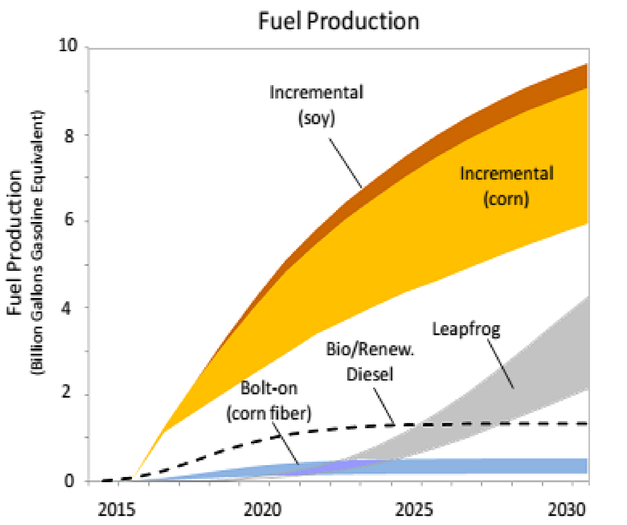
Sources: California Air Resources Board

Policy incentives are additive…



…but value accrues to blender under RFS2, v. producer under California LCFS.

US Technical Potentials for '3 biofuel routes forward' (estimated)



Based on NextSTEPS biofuels analysis (2014). Incremental volumes *displace existing* production. Leapfrog and bolt-on are additional volumes.

Source: Adapted from Morrison et al. (submitted and 2014).

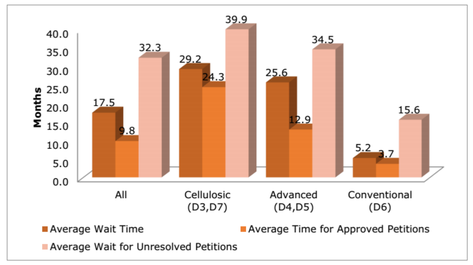
TRACKING EMERGING PATHWAYS (Project 1)

Emerging fuel pathways indicate alternative fuel market response to the policy landscape (including incentives), given business realities. Can they tell us anything about the evolving business case for alternative fuels?

The research will:

- Build a database of emerging fuel pathways in the US Renewable Fuel Standard and California Low Carbon Fuel Standard (possibly also EU Renewable Energy Directive)
- Look for patterns in key fuel pathway characteristics
  - Fuel type, feedstock? Supply chain process and location?
  - Carbon intensity rating? Timing of petition or approval?

Biotechnology Industry Organization (BIO) accounting of RFS Petition Timing



Source: BIO 2014

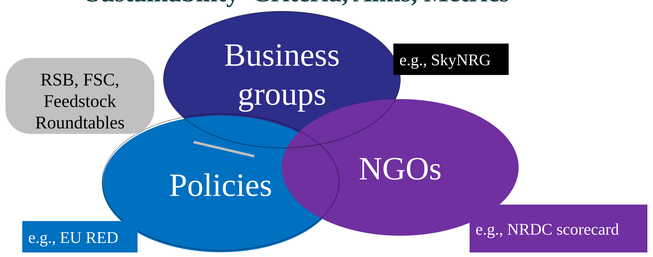
- Analyze data using simple descriptive and exploratory procedures (frequencies, crosstabs, cluster analysis, equivalence of means tests) as well as indicators of agency performance (e.g., pathway petition processing time)
- Consider, as feasible, other key factors shaping emerging fuel pathways
  - Relative fuel prices with and without consideration of program credit prices, supplementary policies (e.g., state biofuel programs)

EXAMINING SUSTAINABILITY SCHEMES (Project 2)

Key uncertainties remain about whether bioenergy can deliver GHG emission-lowering benefits without undue unintended consequences. Questions persist about which feedstocks can be used sustainably, in what volumes, and under what conditions (where, etc.).

One result: proliferating sustainability schemes aiming to assess sustainability of bioenergy use, measure criteria associated with it, and sometimes mitigate unwanted consequences. Choosing if and how to participate in biofuels (and other biomaterials) increasingly requires businesses to navigate this "sustainability landscape" – to access markets through policies or "green" credentials.

Sustainability Criteria, Aims, Metrics



The research will ask:

- How do these types of schemes compare (overlap or involve different tradeoffs)?
- How generic can they be – or do they need to be customized (feedstocks and/or locations)?
- Policy implications (especially California)?

Contacting the Authors:
Julie Witcover (jwitcover@ucdavis.edu), Lew Fulton (lmfulton@ucdavis.edu)