Subsidizing Biofuels in the United States: 2007 Update

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Overview of the 2007 Update

- Updated information on production and consumption.
- Improved data on credit subsidy programs.
- Expanded range of life cycle assessments for displacement values.
- Pending subsidies in federal Energy and Farm bills.
- Unable to fully update state-level subsidies.

Subsidies Remain Central to Biofuels Economics

- **49 states have at least one incentive for ethanol or biodiesel.**
  - **9 states have > 20 policies each.**
  - **Additional funding via conventional economic development programs.**
- **Federal: 79 distinct bills introduced on ethanol or biodiesel through September.**
  - **15 of these included Renewable Fuel Standards.**
  - **Energy bill (HR 6 in the Senate; HR 3221 in the House) awaiting reconciliation; has major biofuel provisions.**
  - **2007 Farm Bill (HR 2419) does as well.**
- **State activity also high, though not evaluated.**

More Than $90 Billion in Subsidies for 2006-12 Period

- Majority to ethanol ($67-82 billion)
  - Rising with production: $5.8-7.0b in 2006 jumping to $9-11b by 2008.
  - Ethanol support still means corn-ethanol.
  - Totals in 2006 report ($44-61b) were pegged to 7.5 bgy RFS; current estimates use market projections by EIA and FAPRI.
- Biodiesel subsidies much lower ($9-11b).
  - Some rising production: $0.5-0.6b in 2006, increasing to $1.5-1.9b by 2008.
  - But long-term production expected to stagnate due to poor margins (EIA, FAPRI).

Subsidy Intensity Remains High

- Subsidies per gallon of biofuel
  - More than $1/gallon for ethanol.
  - More than $2/gallon in high estimate for biodiesel.
- Subsidies as a share of fuel market value
  - Ethanol: 40-65%; around 80% at current low prices.
  - Biodiesel: 55-75%.
- Ethanol subsidies per MMBtu produced ($15) lower than in early 1980s, but on par with late 1980s ($17.50).

Subsidy Value Concentrated Among a Handful of Programs

- Excise tax credits dominate:
  - Ethanol: $34-48b for 2006-12, nearly 60% of total
  - Biodiesel: $4-6b for 2006-12, ~45% of total.
- Market price support
  - $17.5b for ethanol for 2006-12.
  - Will become largest subsidy for both fuels under many pending RFS plans.
- Feedstock subsidies remain important ($5b during period).
  - Counter-cyclical payments down.
  - Direct payments remain significant; fuels taking larger share of crop.
- Accelerated depreciation:
  - Classed as a solid waste facility – 7 yr write-off, 200% declining balance.
  - Large asset base; $3.3b for ethanol; $0.7b for biodiesel.

Subsidizing Biofuels Remains an Inefficient Way to Buy Energy Security

- Net displacement, not gross displacement of petroleum and fossil fuels.
- Subsidy($/MMBtu) petrol displaced, 2006-12
  - > $13/MMBtu displaced for all fuels, including hypothetical cellulosic case.
  - Upper end of range as high as $25/MMBtu (biodiesel).
- Subsidy ($/MMBtu) fossil fuel displaced, 2006-12
  - >$23/MMBtu for ethanol and biodiesel; values as high as $60/MMBtu.
  - Hypothetical cellulosic – better, but still expensive: $13-16/MMBtu.
- Wider range than in 2006 study due to more LCA evaluations to draw from.

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Subsidizing Biofuels Remains an Inefficient Way to Buy GHG Abatement

- Wide range of predicted impacts from LCA modeling.
  - Models differ in coverage and sign of impact.
  - Key elements missing such as land use change.
- Even in best-case scenarios, biofuel subsidies are inefficient:
  - $295/mt CO2-equivalent displaced for ethanol; $240 for biodiesel; $110 for hypothetical cellulosic.
  - Could buy 90-170x as much reduction on CCX as with corn ethanol subsidies; 75-225x for biodiesel; and 35-60x for hypothetical cellulosic case.
- Worst case scenarios: we pay $500 - $700/mt of *increased* CO2 emissions relative to the gas and diesel baseline
- Subsidizing biofuels remains an inefficient way to address climate change

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Structural Problems Drive Inefficient and Poorly Targeted Subsidies

- No subsidy phase-outs on oil prices or aggregate production levels.
- Inadequate integration of environmental or climate characteristics.
- Politically-earmarked solutions rather than open competition between all ways to address over-reliance on petrol in transport.

Up and Coming: RFS Mandates Likely to Become Single Largest Subsidy

- **Cost.** Much higher mandates at much higher cost
  - 36 bgy by 2022 in HR6; 60 bgy in 2030 (S23).
  - Increased cost of 60 bgy mandate to fuel system: **>$130 billion/year** by 2025 (EIA, 9/07).
  - Additional costs in vehicle infrastructure, food sector.
- **Fuel diversity**. anything but corn starch and co-processed biodiesel.
  - HR6: 21 bgy of "advanced" biofuels includes all biomass but corn starch.
  - Potential carve outs or premiums for biodiesel (HR2178); E85 (HR791).
  - Fossil energy not normally used in transport (e.g., coal-to-liquids) (S1158).
- **Environmental qualifications**. Few proposals restrict access based on GHG impacts, despite much larger land and crop impacts.
  - HR6: 20% reduction or more in lifecycle GHG emissions; no info on which models will be used to benchmark start point, benchmark changes.
- **Arbitrage between RECs and RFS credits?**
  - Meeting 90% renewable use in production via RECs or other offsets appears possible.
  - Wording under HR6 appears to allow cellulosic producer using on-site renewable energy credits to earn 4.0 RFS credits/gallon fuel through 2015.

Up and Coming: Biofuels Tax Credits

- VEETC/VEBTC
  - Continued benefits: extended 2-4 years; no technical corrections to exclusion of credits from taxable income.
  - Exclusions: “splash-and-dash” and co-produced diesel; denaturants.
  - Reduction in VEETC of 5 cpg if domestic consumption exceeds 7.5 bgy. (HR2419)
- Supplemental credits
  - Additional 50 cpg for cellulosic ethanol. (HR2419, 3221)
  - Additonal 25 cpg for any ethanol made using >90% biomass energy. (HR2419)

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Up and Coming: Other Notable Subsidies

- Expensing capital to convert to coal-fired ethanol (HR683).
- Growing federal R&D support, grants.
- Loan guarantees: up to $2 billion authorized; in additional to existing Title XVII under EPACT.
- Subsidies to cellulosic feedstocks, such as through the Biomass Energy Reserves (HR2419).
- Strategic biofuels stockpiles (HR682).
- Expanded CAFE credits for B20 (HR3221); with trading, will fleet performance actually decline?

Recommendations

- Stop compounding the problem with ever more subsidies.
- Policy must be neutral with respect to full range of transport fuel diversification.
- If subsidies are to be continued:
  - Various options should be competed against each other.
  - Eligibility must take into account environmental profile of production chain.
  - Eligibility should phase out in high oil prices.
- Sound decisions not possible without systematic data on subsidization from multiple layers of government.