Climate Policy Impacts on Beet Sugar

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Greenhouse Gas Basics

- 2009 US emissions: 6640 million metric tons carbon dioxide equivalent (CO₂e)
  - down by 8.6% from 2007 high
- 83% of greenhouse gas emissions is CO₂
  - balance is methane, nitrous oxide, and manufactured gases
- 79% of greenhouse gas emissions is CO₂ from fossil fuel combustion
  - 41% electricity generation
  - 33% transportation
  - 14% industrial
  - 7% residential
  - 4% commercial
Energy & Emission Sources - 2009

U.S. Energy Consumption by Energy Source
- Petroleum: 37.3%
- Coal: 20.9%
- Natural Gas: 24.7%
- Nuclear Electric Power: 8.8%
- Renewable Energy: 8.2%

U.S. Energy-Related CO₂ Emission by Fuel
- Petroleum: 41.6%
- Coal: 35.3%
- Natural Gas: 23.0%
Climate Legislation Design

Points of Regulation

- regulate upstream (price signal on the fuel)
  - petroleum – transportation and heating oil
  - natural gas – residential and commercial use
- regulate downstream (price signal on emissions source)
  - coal – utility and industrial users
  - natural gas – industrial users

Settle with the government annually:

- cap-and-trade: turn over allowances (1 allowance per metric ton CO$_2$e emissions)
  - (e.g., Waxman-Markey; Kerry-Lieberman)
- tax: pay the tax rate per ton of emissions or CO$_2$ content of fuel
  - (e.g., Cantwell-Collins)
Sugarbeet Processing Facilities

U.S. Sugarbeet Producing Areas
Sugarbeet Processing Facilities (cont.)

- About 30 million tons of beets processed annually
- 4.3 million metric tons of CO$_2$ emissions per year
  - equivalent to one medium size coal-fired power plant (600 total in US)
- Emissions create liabilities under legislation to deal with climate change
Options to Mitigate Impacts Within Legislation

- **EITE** – energy intensive, trade exposed industry designation
  - allocated “free” allowances to help offset costs for 10 years
  - impacts remained high: $20-29M in first year; $500M ($2007) in first 12 years

- Consider as part of agricultural sector instead of industrial sector
Options to Reduce CO₂ Emissions

- Fuel switch from coal to natural gas
  - current fuel split for all facilities is 85 coal/15 natural gas
  - from EIA fuel price projections, full conversion would result in a five-fold increase in annual fuel costs to over $400 million per year

- Utilize renewable energy
  - wind
  - solar
  - biomass

- Increase energy efficiency
Energy Efficiency is Key

- Improved performance: since 1990, sugarbeet processors reduced energy intensity by 24%
  - reduced CO₂ intensity by over 20%
  - invested $225 million in projects to improve efficiency since 2000
  - investigate new ways to use waste products from processing to reduce CO₂ emissions, e.g.,
    - methane collection and use
    - fuel utilization of spent pulp

- Combined Heat and Power (CHP)
  - more than 80% of beet sugar is produced at facilities utilizing CHP
  - CHP provides electricity at efficiency double that of the electric power sector
Outlook for 112th Congress

- Comprehensive legislation on climate policy won’t happen in this session
  - unlikely in the near-to-mid term

- Potential actions on complimentary measures – positive impacts on emissions without a regulatory program
  - Renewable Electricity Standard (RES)/Clean Energy Standard (CES)
  - incentives for energy efficiency
  - appliance standards

- RES/CES could provide incentives to sugar beet processors
  - CHP systems received benefits in previous Senate bill
EPA Regulation of Greenhouse Gases

- Supreme Court decision in April 2007 (Massachusetts v. EPA)
  - EPA must regulate if greenhouse gases endanger public health and the environment
- Endangerment finding – December 2009
- Greenhouse gas standards for motor vehicles – April 2010
  - begins model year 2012
  - GHG now “subject to regulation” under the Clean Air Act
  - triggers regulation of stationary sources under the prevention of significant deterioration (PSD) and Title V permit programs
- Greenhouse gas standards for stationary sources – June 2010
  - “Tailoring” Rule phased in PSD/Title V permit regulations as of 1/2/2011
- New Source Performance Standards (NSPS) for greenhouse gases – proposals later in 2011
  - affects new, modified, and existing sources in 2 categories:
    - electric generating units and refineries
EPA Regulation of Greenhouse Gases – PSD

- PSD permits required for new or modified stationary sources
  - >75,000 tons of CO$_2$e per year
- PSD program implemented by states in most cases
- Permitting authority determines emissions limitation
  - best available control technology (BACT)
  - evaluate economic, energy, environmental impacts of each option to choose BACT
- EPA BACT guidance to permitting authorities in November 2010
  - did not prescribe specific technologies as BACT
  - maintained discretion of permitting authorities
  - highlighted energy efficiency as a control option
  - created more uncertainty in permitting process
Congressional Challenges to EPA Greenhouse Gas Regulations

- Republicans in the House and some Senate Democrats introducing bills to:
  - defund EPA’s greenhouse gas programs (use appropriations process)
  - remove EPA’s legal authority (Sen. Barrasso (R-WY), Rep. Upton (R-MI, 6th))
  - suspend program for 2 years (Sen. Rockefeller (D-WV))

- Senate passage unlikely
  - Administration veto threat

- Funding limitations do not remove the existing legal requirement to comply with the PSD program

- Bottom line: stay tuned