CCS and US Cap-and Trade Proposals

By Robert M. Sussman
Senior Fellow
Center for American Progress
Washington DC
bsussman@americanprogress.org

Current Status of CCS Under US Law

- CCS at demonstration project stage in US
- Little incentive now to install CCS at new coal plants
  - Capital cost increases
  - Reduced efficiency and output
  - Higher electricity costs
  - Uncertainties about technology
  - Liability concerns
- CCS not likely to move forward until drivers/incentives change

A New Policy Framework to Push CCS Forward

- Overall Challenge:
  - How do we put in place policy drivers that change economic calculus of plant developers and spur adoption of CCS?
- Key focus in US:
  - Using cap-and-trade programs to encourage CCS
- Key policy question:
  - Will putting a price on carbon under allowance trading system eliminate current economic barriers to CCS and drive deployment?

S. 2191– Lieberman-Warner Climate Security Act

- Leading US legislative proposal – will be considered by US Senate starting on June 2
- Recently modified by Boxer Substitute (S. 3036)
- Establishes cap-and-trade system covering 87 percent of US emissions
- Would achieve US emission reductions below 2005 levels of –
  - 17-19 percent by 2020
  - 57-63 percent by 2050

How Does Cap-and-trade Work under S. 2191?

- Year-by-year reduction in allowable emissions by covered sources (the “cap”)
- Covered sources must hold *allowances* equal to their emissions. They include:
  - Upstream producers/importers of petroleum and natural gas – must hold allowances for downstream emissions
  - Users of coal (electric utilities) -- must hold allowances for direct emissions from coal combustion
- EPA establishes an Emission Allowance Account for each calendar year
  - Total allowances decline as yearly cap declines
  - 5.775 billion allowances in 2012 declining to 1.732 billion in 2050
- Allowances can be bought, sold or held by anyone

How Allowances Are Distributed

- L-W distributes allowances by --
  - Free allocation to certain entities and
  - Annual auction process
- Auction conducted by Environmental Protection Agency
- Percentage of allowances auctioned increases over time
  - 26.5% in 2012
  - 41% in 2022
  - 69.5% in 2031

Free Distribution of Allowances to Industry ("Transition Assistance")

- Portion of total allowances distributed for free to industry declines over time
  - 43% in 2012
  - 28.5% in 2022
  - 0% in 2031
- Largest share of free allowances goes to
  - Fossil-fueled power plants (18%)
  - Carbon intensive manufacturing (11%)

Use of Auction Revenues

- Revenue stream will grow as allowance prices and size of auction increase
- One estimate is that auction revenues will be –
  - 38B in 2012
  - 63B in 2022
  - 111B in 2030
- Auction revenues will be used for multiple purposes, including
  - Tax relief for energy consumers
  - Deficit reduction
  - Advanced technology deployment

Would Cap-and-Trade Alone Promote CCS?

- Cost per ton of CCS is estimated to be ~ $40-55
- US Environmental Protection Agency projects that allowance prices under S. 2191 will be:
  - $17 per ton in 2012
  - $28 per ton in 2020
  - $37 per ton in 2025
  - $46 per ton in 2030
- CCS will likely not be cost-competitive with other options before 2030
- It would be more economic to build an uncontrolled conventional coal plant and offset emissions by purchasing allowances
- CONCLUSION: Even with cap-and-trade, carrots and sticks are needed for wide deployment of CCS and to discourage conventional coal plants

Going Beyond Cap-and-Trade: Three Mechanisms to Accelerate CCS Deployment

- Issue free bonus allowances
- Require CCS through emission performance standard for new plants
- Provide subsidies using revenues from auctioning of allowances

Bonus Allowances under S. 2191: Program Details

- “Bonus allowances” issued to reward CO2 capture and storage
- 3-4% of total allowances set aside
- Program expires in 2039
- Number of allowances awarded based on “bonus rate”
  - Starts at 2 allowances per ton sequestered
  - Gradually declines to zero in 2040
- Facilities must capture at:
  - 60% rate for facilities beginning construction before 2018
  - 85% rate if construction starts after 2018
- Bonus allowances distributed for 10 years after start of plant operations

Bonus Allowances: Rationale

- CCS will be accelerated because dollar value of allowances will close “cost gap” between CCS and uncontrolled plants
- But how will bonus allowances really work?
  - How much CCS would we get and at what cost?
  - Are the incentives too great or not great enough?
  - Would conventional coal plants still be built?

Bonus Allowances: CAP Critique

- Would subsidize a limited amount of new coal through 2030 (around 80 Gigawatts)
- Bonus allowances for all plants would be worth $60-80 billion between 2012 and 2030 (EPA allowance price projection)
- Bonus allowance subsidy is greater than necessary to close “cost gap” between CCS and regular coal
- If allowance prices are higher than predicted, bonus allowances would be worth even more
- Windfall allowances could be used to offset emissions at existing coal plants and delay reductions
- New plants could still be built without CCS

Emission Performance Standard Proposed by CAP

- Would require new coal plants to capture and sequester emissions at level of best performing CCS technology
- Would apply to all plants entering construction after date of enactment of legislation (2008)
- Would provide flexibility in timing of CCS implementation
  - Plants would implement CCS by 2016 or four years after start of operations, whichever is later
  - Phase-in would provide lead-time for demonstration projects and site testing
  - Many experts believe CCS will be ready for wide deployment by 2020

Closing the Cost Gap through Subsidies

- Subsidies would perform same function as bonus allowances
  - provide “carrots” for CCS deployment
  - Offset higher costs of building/operating coal plants with CCS
- Subsidy should cover cost gap between CCS and conventional plants, including cost of purchasing allowances – but NOT provide windfall
  - With emission performance standard, no need to pay “premium” to encourage CCS
- Subsidy should decline over time as price of carbon rises and cost of technology goes down
- Subsidies could only be used for CCS – would NOT provide free allowances to offset emissions at existing plants

How to Pay For Subsidies

- Best revenue source: allowance auction proceeds under cap-and-trade program
- CAP estimate: Can subsidize 150 GW of new coal capacity for $29 billion between 2016 and 2030
- Cost of subsidy much lower than cost of bonus allowances
  - Reason: No windfall above actual cost differential
- Subsidies from auction proceeds could also be used for existing plant retrofits
- Latest version of L-W would provide $15.7 billion from auction proceeds to kickstart CCS demonstration projects
  - But full-scale deployment would be encouraged by bonus allowances

Conclusions

- Cap-and-trade will not automatically result in CCS and discourage conventional coal
- “Carrots” needed to close CCS cost gap
- Free bonus allowances will produce windfalls for some plants but not necessarily fund large-scale deployment
- Door still open for conventional coal
- Best approach: performance standard requiring CCS for new plants plus subsidy to close cost gap
- Best source of subsidy: Revenues from auctioning of allowances