

# Cap-and-Trade vs. Command-and-Control: An Economic Assessment

In April 2009, the U.S. Environmental Protection Agency (EPA) issued an endangerment finding that formally declared that greenhouse gases (GHG) pose significant harm to human health and welfare. Because of the endangerment finding and recent court action, EPA has the authority to control greenhouse gases under the existing Clean Air Act. The method in which EPA decides to use this authority remains up for debate.

Given EPA's financial and regulatory limitations, analysts predict that if the agency were to regulate GHG emissions using the Clean Air Act, those regulations would not include an economy-wide cap-and-trade program or other market mechanisms that allow for flexibility in meeting the assigned emissions target. Instead, there would likely be a combination of various **command-and-control policies** targeting major emitters such as power plants and automobiles.<sup>1</sup> This means that *EPA would be in charge of telling covered entities how to comply with reducing their emissions rather than empowering these companies to find the most cost-efficient means themselves.* There would be no guarantee that agriculture would be allowed an exemption from regulation and there would be no offsets market for agriculture since this option would require additional authority.

EPA is supportive of the American Clean Energy & Security Act of 2009 (ACES), which recently passed the House of Representatives (H.R. 2454). This legislation would institute a nationwide **cap-and-trade program** to reduce GHG emissions as well as creating an offsets market. In other words, this legislation would set a limit on GHG emissions, and then capped entities would be allowed to meet that limit through a number of market mechanisms including trading or buying reductions from other companies or offsets from uncapped sectors like agriculture.

EPA openly recognizes that the Clean Air Act was not intended to deal with the complexities of regulating GHG emissions and it would prefer to have specific guidance in the form of legislation on this topic. *However, should the pending legislation fail to become law, EPA's finding of endangerment obligates the agency to resort to the previously mentioned mandatory command-and-control method to regulate emissions without the flexibility measures included in H.R. 2454.* These flexibility measures, such as banking, borrowing and trading emissions reductions or offsets, are extremely important for reducing the cost of compliance to capped entities and energy consumers alike.

While both strategies can substantially work to decrease greenhouse gas levels, the market-based cap-and-trade program and the government centered command-and-control program pose very different economic impacts to the agricultural community. Both programs create costs to the agricultural community but **the cap-and-trade program allows for the production of offsets, which can compensate for costs by generating additional revenue. The command-**



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**and-control option would involve direct regulation of some sectors associated with costs to the economy and agriculture without opportunity for revenue.**

### **ECONOMIC IMPACT OF A COMMAND-AND-CONTROL APPROACH**

In a command-and-control approach, EPA would implement a regulatory program with policies that would impose mandates requiring certain practices, standards or products deemed necessary to reduce GHG emissions. While such programs could decrease greenhouse gas levels, the system would rely on the judgment of government and not the market to determine the approach. In fact, the Clean Air Act and judicial decisions have made clear that *EPA is not allowed to take economic and technological feasibility into account when setting these types of standards.*<sup>2</sup> Research shows that **command-and-control policy can raise costs tenfold for consumers** as regulation raises costs for certain products, which creates higher prices, but leaves no room for participants and other players to generate income to offset these costs.<sup>3</sup>

Recently, EPA issued an Advance Notice of Proposed Rulemaking (ANPR) which indicated that command-and-control regulation could result in many negative economic impacts on the agricultural industry. Under such a system, the agricultural industry would not have opportunity to offset any costs of the regulation. The ANPR points out that a command-and-control program for greenhouse gas emission control is not suitable for agriculture for a multitude of reasons, a few being that:<sup>4</sup>

- Agricultural entities are ill-equipped to bear the costly burdens of compliance.
- Around 1.9 million small operation farms would meet a 100-tons-per-year emissions threshold which could trigger regulation and would further increase the number of entities that cannot meet compliance costs.

Other, perhaps hyperbolic, analysis by the American Farm Bureau Federation concludes that under the Clean Air Act mandatory fees of “\$175 per dairy cow, \$87.50 per beef cow and \$21.87 per hog,” would be administered to farmers and ranchers.<sup>5</sup>

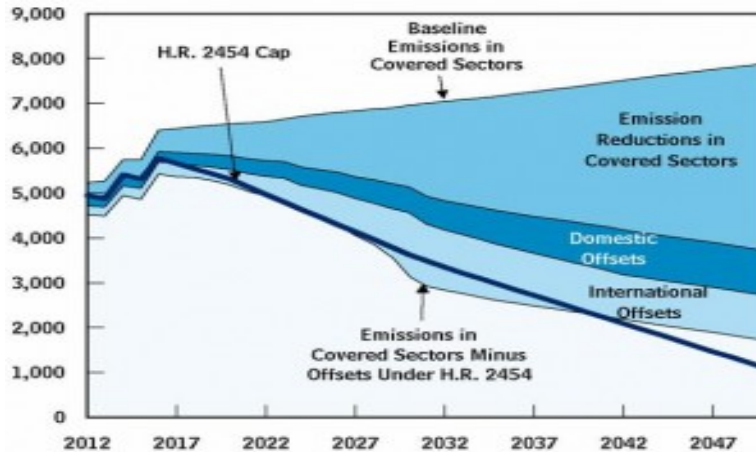
### **ECONOMIC IMPACT OF A CAP-AND-TRADE APPROACH**

Unlike a command-and-control approach, a market-based cap-and-trade program as outlined by the American Clean Energy & Security Act of 2009 (ACES) would create market opportunities for the agricultural community to reduce greenhouse gas emissions. The bill as it stands would curb emissions from electric utilities, oil companies and large industrial sources by setting a cap and then allowing a flexible market to arise so that companies could choose the most effective means of meeting their GHG reduction requirement. Under a cap-and-trade market, agriculture could generate additional revenue by selling emissions offset credits to industries required to reduce their emission levels even though, as an uncapped sector, agriculture would not be regulated. These credits would be created by sequestering and reducing carbon or other GHG emissions through agricultural practices or processes that capture GHG emissions. On the next page is a chart that shows estimated greenhouse gas emissions reductions and offset potential under the proposed cap-and-trade legislation<sup>6</sup>:

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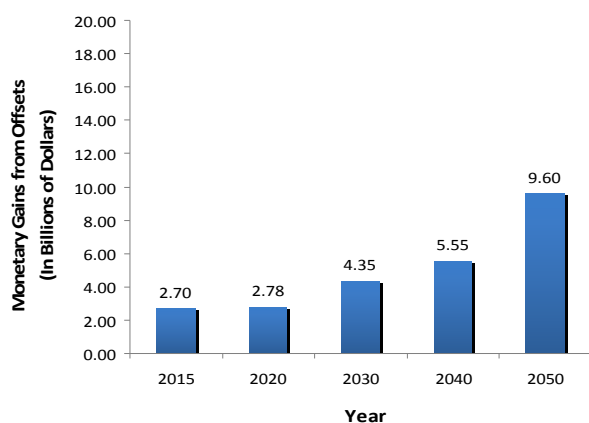


Currently, the ACES bill allows for emissions to be offset by:<sup>7</sup>

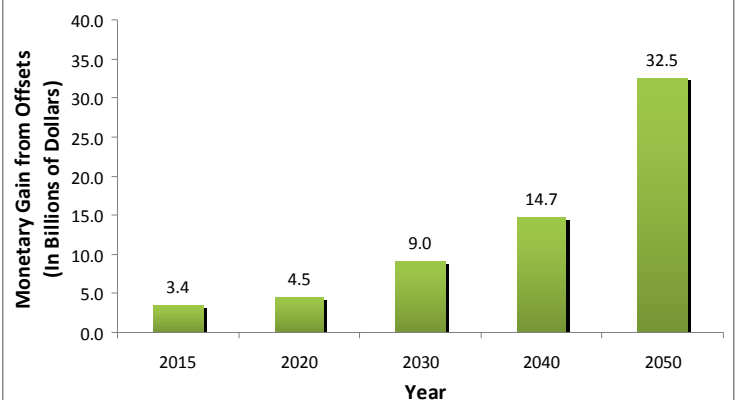
- Soil Carbon Sequestration
- Animal Waste Methane Capture
- Nitrous Oxide Reductions from Fertilizer Application
- Afforestation Carbon Sequestration
- Forest Management Carbon Sequestration

The most recent studies conducted by EPA show that carbon offsets could be valued at \$15-\$30 per metric ton with prices increasing at 5% a year depending on market demand under the ACES act.<sup>8</sup> **Projected revenue from the total offset program could generate at least 2.7 billion dollars within the next five years with profits increasing into the future.**<sup>9</sup> The graphs below show entire revenue projected to be generated by the domestic offset market depending on the price per ton of carbon sequestered.<sup>10</sup>

**Estimated Value of Domestic Offset Market (at \$15 per ton)**



**Estimated Value of Domestic Offset Market (at \$15 per ton with an annual 5% price increase)**





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If offset providers earn \$15 per metric ton of CO<sub>2</sub> equivalent sequestered or reduced with prices rising at 5% annually, it is predicted that **the domestic offset market has the potential to earn 4.5 billion dollars annually by 2020.**<sup>11</sup>

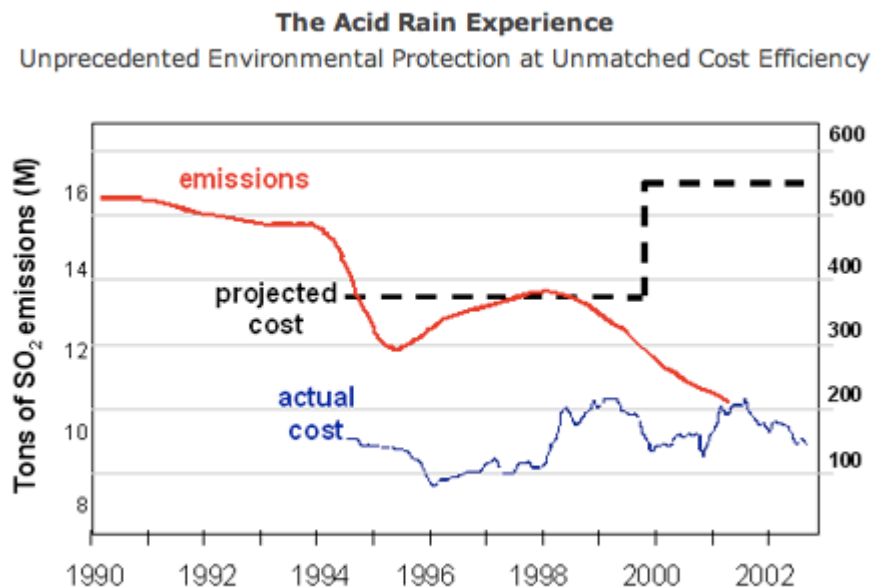
### CASE STUDY: SO<sub>2</sub> “Acid Rain” Regulation

Historic examples reveal between command-and-control regulations and cap-and-trade programs, cap-and-trade is by far the more cost effective method for regulating emissions. In 1990, the EPA implemented a program to decrease SO<sub>2</sub> emissions through a cap-and-trade program under the direction of Congress. The program has been successful in decreasing ambient concentrations of SO<sub>2</sub> emissions by 40% since 1990 in the Northeast and Mid-Atlantic regions of the United States.<sup>12</sup> These reductions of SO<sub>2</sub> emissions were conducted in a way that generated very little cost in part because:<sup>13</sup>

- Regulated entities were able to trade pollution permits, or allowances. Those who were able to reduce emissions at the lowest cost had the incentive to do so at a greater rate than required by law, and those who could only reduce their emissions at a high cost were able to buy reductions elsewhere in the system to avoid the financial burden.
- Capped entities had the flexibility of implementing their reductions according to a schedule that allowed them to save on costs.

**Economic analysis has found that cost savings from implementing a cap-and-trade program rather than a command-and-control program for SO<sub>2</sub> at \$1 billion annually.**<sup>14</sup>

The following graph depicts the cost-effectiveness and ability to reduce SO<sub>2</sub> emissions from a cap-and-trade program<sup>15</sup>:





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## SUMMARY

- Since command-and-control mechanisms do not allow flexibility in how emissions targets are met, it is a more costly means of imposing regulation. Higher costs for capped entities will likely translate into higher costs for significant energy users like farmers.
- A cap-and-trade program would allow the market, and not the government, to decide the most cost-effective solutions.
- A cap-and-trade system would promote the lowest cost opportunities for reducing GHG emissions while generating revenue for uncapped sectors such as agriculture and forestry.
- Offset revenue from a cap-and-trade program is projected to be valued at 2.7 billion dollars within 5 years of the legislation's implementation.<sup>16</sup> The successful cap-and-trade program for SO<sub>2</sub> shows the ability to reduce emissions substantially in a cost-effective manner. Cap-and-trade programs have the potential to decrease cost by \$1 billion annually from command-and-control programs.<sup>17</sup>

## References

<sup>1</sup> Nicholas School of the Environment. 2009. Bill Chameides. *EPA Announces Endangerment Finding*. Retrieved online from: <http://www.nicholas.duke.edu/thegreengrok/epa-endangermentfinding>

<sup>2</sup> See for example: Lead Industries Association v. EPA (D.C. Cir., 1980). Also *Whitman v. American Trucking Association*, et. al. (U.S. Sup. Ct., 2001).

<sup>3</sup> Kansas Energy Council. 3 August 2007. *Greenhouse Gas Emissions: Policy and Economics*. Retrieved online from: [http://www.vlib.us/kansasenergy/GHG\\_Review\\_FINAL.pdf](http://www.vlib.us/kansasenergy/GHG_Review_FINAL.pdf)

<sup>4</sup> U.S EPA. 11 July 2008. *Preamble: Advance Notice of Proposed Rulemaking: Regulating Greenhouse Gas Emissions under the Clean Air Act*. Retrieved online from:

<http://www.epa.gov/climatechange/emissions/downloads/ANPRPreamble1.pdf>.

<sup>5</sup> American Farm Bureau Federation. 5 March 2009. *Farm Bureau Calls 'Cow Tax' Bill Timely and Critical*. Retrieved online from: <http://www.fb.org/index.php?fuseaction=newsroom.newsfocus&year=2009&file=nr0305b.html>

<sup>6</sup> Congressional Budget Office. 4 July 2009. *Reductions in Greenhouse Gas Emissions under the House's Climate and Energy Bill*. Retrieved online from: <http://cboblog.cbo.gov/?p=316>

<sup>7</sup> U.S. EPA. 2009. *EPA Analysis of the American Clean Energy and Security Act of 2009 H.R. 2454 in the 111<sup>th</sup> Congress*. Retrieved online from: [http://www.epa.gov/climatechange/economics/pdfs/HR2454\\_Analysis.pdf](http://www.epa.gov/climatechange/economics/pdfs/HR2454_Analysis.pdf)

<sup>8</sup> U.S EPA. 2009. *EPA Analysis of the American Clean Energy and Security Act of 2009 H.R. 2454 in the 111<sup>th</sup> Congress*. Retrieved online from: [http://www.epa.gov/climatechange/economics/pdfs/HR2454\\_Analysis.pdf](http://www.epa.gov/climatechange/economics/pdfs/HR2454_Analysis.pdf)

<sup>9</sup> Calculations based on 2009 EPA analysis of domestic offset usage under the domestic and international offset market scenarios with carbon priced at \$15 per ton. Data from: U.S EPA. 2009. *EPA Analysis of the American Clean Energy and Security Act of 2009 H.R. 2454 in the 111<sup>th</sup> Congress*. Retrieved online from:

[http://www.epa.gov/climatechange/economics/pdfs/HR2454\\_Analysis.pdf](http://www.epa.gov/climatechange/economics/pdfs/HR2454_Analysis.pdf)

<sup>10</sup> Calculations based on 2009 EPA analysis of domestic offset usage under the domestic and international offset market scenarios with carbon priced at \$15 per ton and \$30 per ton with prices rising at 5% a year. Data from: U.S EPA. 2009. *EPA Analysis of the American Clean Energy and Security Act of 2009 H.R. 2454 in the 111<sup>th</sup> Congress*. Retrieved online from:

[http://www.epa.gov/climatechange/economics/pdfs/HR2454\\_Analysis.pdf](http://www.epa.gov/climatechange/economics/pdfs/HR2454_Analysis.pdf)

<sup>11</sup> Calculations based on 2009 EPA analysis of domestic offset usage under the domestic and international offset market scenarios with carbon priced at \$15 per ton with prices rising at 5% a year. Data from: U.S EPA. 2009. *EPA Analysis of the American Clean Energy and Security Act of 2009 H.R. 2454 in the 111<sup>th</sup> Congress*. Retrieved online from:

[http://www.epa.gov/climatechange/economics/pdfs/HR2454\\_Analysis.pdf](http://www.epa.gov/climatechange/economics/pdfs/HR2454_Analysis.pdf)

<sup>12</sup> U.S EPA. *Cap and Trade: Acid Rain Program Results*. Retrieved online from: <http://www.epa.gov/airmarkt/cap-trade/docs/ctresults.pdf>

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<sup>13</sup> Environmental Science and Technology. 31 August 1999. *Environmental Effects of SO<sub>2</sub> Trading and Banking*. Retrieved online from: <http://pubs.acs.org/doi/full/10.1021/es9902726?cookieSet=1>

<sup>14</sup> Robert Stavins. 1998. *What Can We Learn from the Grand Policy Experiment? Lessons from SO<sub>2</sub> Allowance Trading*.

<sup>15</sup> Environmental Defense Fund. 2009. *The Cap and Trade Success Story*. Retrieved online from: <http://nwbioregion.com/2008/08/07/cap-and-trade-success/>

<sup>16</sup> Calculations based on 2009 EPA analysis of domestic offset usage under the domestic and international offset market scenarios with carbon priced at \$15 per ton and \$15 per ton with prices rising at 5% a year. Data from: U.S EPA. 2009. *EPA Analysis of the American Clean Energy and Security Act of 2009 H.R. 2454 in the 111<sup>th</sup> Congress*. Retrieved online from: [http://www.epa.gov/climatechange/economics/pdfs/HR2454\\_Analysis.pdf](http://www.epa.gov/climatechange/economics/pdfs/HR2454_Analysis.pdf)

<sup>17</sup> Robert Stavins. 1998. *What Can We Learn from the Grand Policy Experiment? Lessons from SO<sub>2</sub> Allowance Trading*.