Exhibit 19

Declaration of Margo Thorning

The Economic Impact of Regulating U.S. Greenhouse Gas Emissions Under the Clean Air Act

Qualifications and Background

1. I am currently senior vice president and chief economist with the American Council for Capital Formation (ACCF) and director of research for its public policy think tank. I also serve as the managing director of the International Council for Capital Formation (www.iccfglobal.org), a think tank incorporated in Brussels. The ICCF is an affiliate of the ACCF. Previously, I served at the U.S. Department of Energy, the U.S. Department of Commerce, and the Federal Trade Commission. I received a B.A. from Texas Christian University, an M.A. in economics from the University of Texas, and a Ph.D. in economics from the University of Georgia.

2. I am an internationally recognized expert on tax, environmental, and competitiveness issues. I write and lectures on tax and economic policy, am frequently quoted in publications such as the Financial Times, Suddeutsche Zeitung, New York Times, and Wall Street Journal, and have appeared internationally on public affairs news programs. In North America, I have has testified as an expert witness on capital formation and environmental issues before various U.S. congressional committees, including the Senate Finance Committee, the Senate Environment and Public Works Committee, the Senate Energy and Natural Resources Committee, the Senate Commerce, Science and Transportation Committee, the Joint Economic Committee, the Senate Governmental Affairs Committee, the House Ways and Means Committee, the House Commerce Committee, and the House Committee on Government Reform. I recently made a presentation "Investing in Energy and Industrial Development: Challenges and Opportunities" at a UN Commission on Sustainable Development meeting. I also served on DOE's Electricity Advisory Board's Subcommittee on Standards of Conduct and Corporate Practices. I have also has testified before the Senate of Canada on that country's proposals for tax reform. Furthermore, I have made presentations on the economic impact of climate change policy at forums sponsored by the ICCF in China, India, other Asian countries, the European Union, and Russia. I am a coeditor of numerous books on tax and environmental policy, including "Climate Change Policy and Economic Growth: A Way Forward to Ensure Both" and "The U.S. Savings Challenge: Policy Options for Productivity and Growth." (See www.accf.org and www.iccfglobal.org for complete list of publications.)

3. I prepared this declaration myself. I am qualified to make judgments about the effects of regulatory changes on U.S. investment by virtue of my thirty years of experience in the federal government and in the private sector analyzing and modeling the way business investment and the overall economy responds to changes in taxes, regulatory policies, including environmental policies.

Scope of Declaration

4. I was engaged by petitioners in support of their motion to stay the imposition of greenhouse gas permitting requirement on stationary sources. My declaration covers the

economic impacts of, specifically, the U.S. Environmental Protection Agency's (EPA's) rules extending stationary source permitting requirements to facilities that emit greenhouse gases.

Summary of Principal Conclusions

5. The imposition of greenhouse gas permitting requirements on stationary sources will negatively impact U.S. investment, job growth and economic competitiveness during the next several years and beyond. Energy prices, including electricity prices, and production costs will raise across many industries as a result of the permitting requirements which are likely to entail fuel switching and /or changes in technologies and production processes. Specifically, the uncertainty regulated entities will face due to permitting delays, lack of knowledge how EPA will define Best Available Control Technology (BACT), permitting challenges from advocacy groups and lack of certainty that the Tailoring Rule will be upheld contribute to a significant rise in the hurdle rate required for new U.S. investment. Unregulated entities will also incur higher hurdle rates for investment due to the delays and uncertainty impacting the investment decisions of their customers in regulated sectors. Higher hurdle rates will decrease U.S. investment (relative to the baseline forecast) and result in slower growth in GDP and employment. In addition, the permitting requirements will also contribute to "carbon leakage" as energy intensive industries shift more production to developing countries whose industries produce more GHGs per unit of output than do those in the U.S.

Background on EPA's Final Rule: Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule

6. On June 3, 2010, the U.S. Environmental Protection Agency (EPA) issued a final rule addressing greenhouse gas emissions from stationary sources under the Clean Air Act (CAA) permitting programs. This final rule sets thresholds for greenhouse gas (GHG) emissions that define when permits under the New Source Review Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities.

7. This final rule purports to "tailor" the requirements of these CAA permitting programs to limit which facilities will be required to obtain PSD and Title V permits. Facilities responsible for nearly 70 percent of the national GHG emissions from stationary sources will be subject to permitting requirements under this rule. This includes the nation's largest GHG emitters—power plants, refineries, and cement production facilities. Emissions from small farms, restaurants, and all but the very largest commercial facilities will not be covered by these programs at this time. Without this tailoring rule, EPA has said the lower emissions thresholds in the CAA would take effect automatically for GHGs on January 2, 2011. Allowing facilities to trigger PSD and Title V based solely on GHG emissions at these lower thresholds would lead to dramatic increases in the number of required permits —tens of thousands of PSD permits annually and millions of title V permits. State, local, and tribal permitting authorities would be overwhelmed and the programs' abilities to manage air quality would be severely impaired, according to EPA. EPA will phase in the CAA permitting requirements for GHGs in two initial steps.

8. In Step 1 (January 2, 2011 – June 30, 2011) only sources currently subject to the PSD permitting program (i.e., those that are newly-constructed or modified in a way that significantly

increases emissions of a pollutant other than GHGs) would be subject to permitting requirements for their GHG emissions under PSD. For these projects, only GHG increases of 75,000 tons per year (tpy) or more of total GHG, on a carbon dioxide equivalent basis (CO_{2e}), would need to determine the Best Available Control Technology (BACT) for their GHG emissions. Similarly, for the operating permit program, only sources currently subject to the program (i.e., newly constructed or existing major sources for a pollutant other than GHGs) would be subject to title V requirements for GHGs. During this time, no sources would be subject to Clean Air Act permitting requirements due solely to GHG emissions.

9. Step 2 (starting July 1, 2011) will build on Step 1. In this phase, PSD permitting requirements will cover for the first time new construction projects that emit GHG emissions of at least 100,000 tpy even if they do not exceed the permitting thresholds for any other pollutant. Modifications at existing facilities that increase GHG emissions by at least 75,000 tpy will be subject to permitting requirements, even if they do not significantly increase emissions of any other pollutant. In Step 2, operating permit requirements will, for the first time, apply to sources based on their GHG emissions even if they would not apply based on emissions of any other pollutant. Facilities that emit at least 100,000 tpy CO2e will be subject to title V permitting requirements.

10. EPA estimates that over a thousand sources will need to obtain Title V permits for the first time due to their GHG emissions. The majority of these newly permitted sources will likely be solid waste landfills and industrial manufacturers. There will be approximately 900 additional PSD permitting actions each year triggered by increases in GHG emissions from new and modified emission sources, according to EPA.

11. Additionally, EPA describes a further rulemaking: Step 3. In this final rule, EPA commits to undertake another rulemaking, to begin in 2011 and conclude no later than July 1, 2012. That action will take comment on an additional step for phasing in GHG permitting, and may discuss whether certain smaller sources can be permanently excluded from permitting. EPA also plans to explore a range of options for streamlining future GHG permitting that have the potential to significantly reduce permitting burdens. EPA will propose viable streamlining options in the "Step 3" rulemaking. EPA states that it will not require permits for smaller sources in Step 3 or through any other action until at least April 30, 2016. The commitments in Step 3 are, of course, merely in a regulation which itself can be changed through a future rulemaking.

Overview of the U.S. Economy

12. As the U.S. prepares for the regulation of greenhouse gases by EPA starting on January 2, 2011, it is important to consider the impact of the pending GHG regulations on U.S. economic recovery and job growth. Some factors to consider as EPA's costly mandates go into effect in less than four months: U.S. GDP growth fell to 1.6 % in the second quarter, down from 3.7 % in the first quarter of 2010. In addition, unemployment has remained unacceptably high for the past two years; in August, 2010 it remains at 9.6%.

13. Bank lending is still constrained, consumer spending is tepid, home sales are plunging, and businesses remain hesitant to hire. Residential real estate remains one of the biggest risks for the U.S. recovery, especially with little support from the job market. In the second quarter, 23

percent of homeowners were underwater, with homes worth less than the balance on their mortgage, according to CoreLogic. Many are simply walking away from their mortgages, adding to the stock of foreclosures and bank charge-offs, which put pressure on banks' capital and their capacity to lend.

14. In spite of slow growth in GDP, the business sector has returned to profitability with surprising speed, giving companies the ability to expand as demand picks up. Increases in spending for equipment, inventories and payrolls have been a major source of growth in the economy in recent quarters. Without the contribution from equipment spending, second-quarter GDP growth would have been zero. However, a significant factor impacting U.S. economic recovery is the weakening of business confidence. The business community faces uncertainty on an unusually large number of fronts. For example, the implementation of health care and financial reform legislation, the fate of the 2001-2004 tax cuts for individuals, possible corporate tax increases, the specter of an almost $10 trillion dollar federal deficit over the next decade as well as the unknown cost of complying with EPA regulation under the CAA are all factors that add to the risk of expanding (or maintaining) facilities and hiring new employees. A key composite of GDP, equipment orders, plunged 8 percent in July, and jobless claims for Aug. 20, while down from the previous week's surge, remains high. Both trends suggest that companies are pulling back.

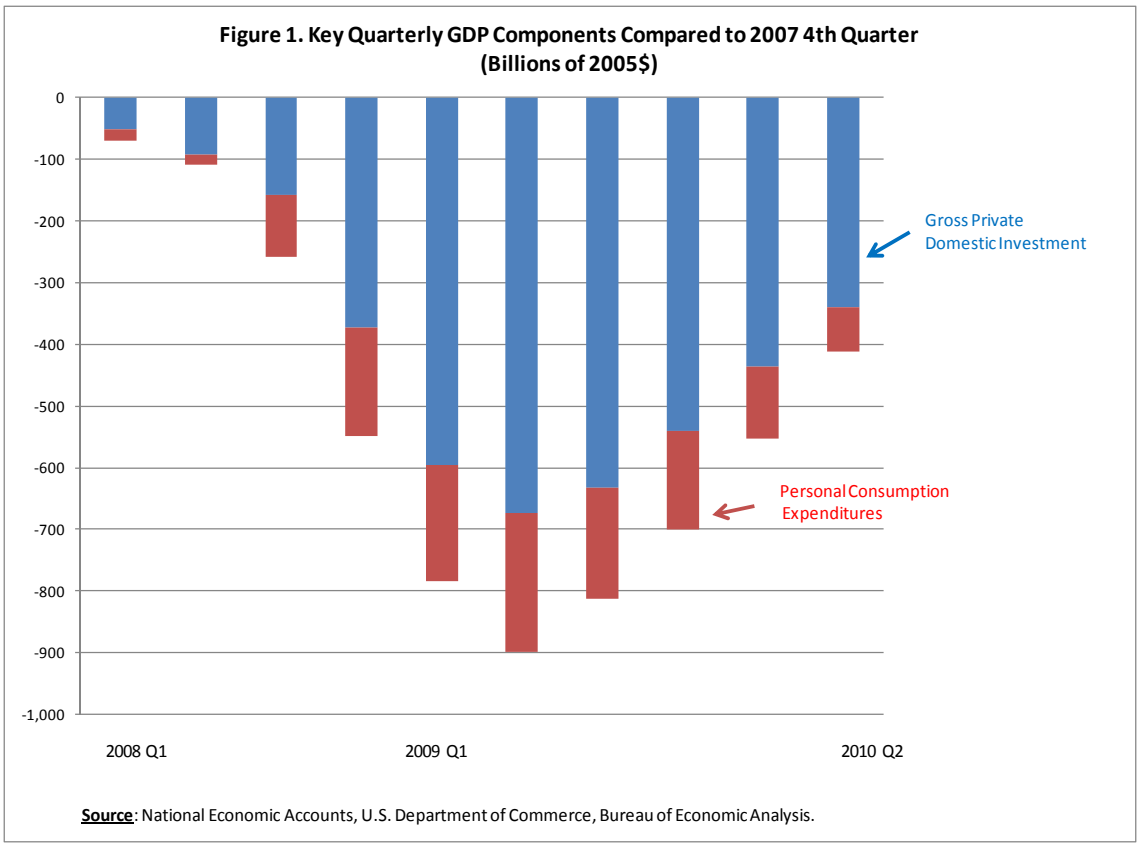
15. After a promising start to the U.S. recovery in 2009, with GDP growth averaging 3.4 percent in the three quarters through this year's first quarter, the U.S. economic upturn now appears to have stalled. The regulation of GHGs that the EPA plans to enforce under the CAA is likely to slow the pace of U.S. economic recovery and hinder the creation of new jobs.

Economic Burden Caused by Regulation of GHGs under the Clean Air Act

- **Role of Investment Spending in U.S. Economic Recovery**

16. One of the most adverse features of EPA's regulating GHG's under the CAA is the impact on the cost of capital and on new U.S. investment. When EPA's regulations begin in January 2011, the most directly impacted types of economic activity will be private sector investments to improve/expand existing facilities or build and equip new facilities. Investments in structures and equipment are what make up the national GDP category called "gross private domestic investment." Any substantial investment could well exceed EPA's threshold level of GHG emissions and be subject to yet unknown CAA requirements.

17. As illustrated in **Figure 1**, dramatic reductions in gross private domestic investment since the last quarter of 2007 are by far the largest contributor to the nation's slow GDP growth. Gross private domestic was down by $339 billion in the second quarter of 2010 relative to the fourth quarter of 2007. In contrast, the decline in second quarter 2010 personal consumption expenditures (PCE) was only $72 billion, relative to the fourth quarter of 2007. In other words, the decline in PCE was a fraction of the decline in gross private domestic investment.



18. EPA's PSD and Title V requirements starting in January 2011 threaten the nation's economic recovery by imposing new, but yet unknown, requirements on private domestic investment. The permitting requirements will hamper the replacement of aging plants and equipment and new investments of all types and make economic recovery and job growth more difficult. If the tailoring rule is not upheld in the courts, EPA estimates that more than 81,000 facilities would need permits under PSD and 6.1 facilities million would need Title V permits. As shown in **Table 1**, investment in private fixed assets by industry has fallen from over $2 trillion dollars in 2006 to $1.7 trillion in 2009, a decline of 24%. Key industries that will be most impacted by EPA regulation of GHGs include agriculture, mining, utilities, construction, manufacturing, transportation and warehousing; these industries were responsible for about 17 % of investment in 2009. After EPA's requirements become firmly understood, investments are likely to be curtailed and/or relocated oversees to locations without similarly restrictive GHG emission and/or technology requirements.

Table 1. Investment in Private Fixed Assets by Industry (billions of dollars)				
	2006	2007	2008	2009
Private fixed assets	2247.6	2246.8	2122.7	1699.3
Agriculture, forestry, fishing, and hunting	39.2	40.6	47.6	40.8
Mining	154.1	173.8	199.5	127.4
Oil and gas extraction	118.2	134.4	154.5	92.5
Mining, except oil and gas	17.9	17.5	17.9	14
Support activites for mining	18	21.9	27.1	20.9
Utilities	77.6	102.5	123.1	122.1
Construction	46.9	52.5	47.3	37.5
Manufacturing	189.1	220.3	236.7	205
Durable goods	110.1	126.7	142.6	123.7
Wood products	4	3.4	2.8	2.3
Nonmetallic mineral products	6.5	7.8	6.1	5.2
Primary metals	6.2	8.7	11.7	9.6
Fabricated metal products	9.8	12.3	13.1	10.7
Machinery	19.6	20.9	25.2	22.1
Computer and electronic products	29	36.2	44.4	39.3
Electrical equipment, appliances, and components	3.8	4.5	4.8	4.2
Motor vehicles, bodies and trailers, and parts	12.8	12.5	12.9	10.8
Other transportation equipment	10.9	13.1	14.6	13.4
Furniture and related products	2	2	1.6	1.3
Miscellaneous manufacturing	5.5	5.3	5.4	4.6
Nondurable goods	79	93.6	94.2	81.3
Food and beverage and tobacco products	15.9	16.1	19.2	16.7
Textile mills and textile product mills	1.8	1.8	1.8	1.5
Apparel and leather and allied products	0.8	0.8	0.6	0.5
Paper products	9.3	8.1	7.7	6.3
Printing and related support activities	5.5	6.2	5.5	4.7
Petroleum and coal products	14.2	21.1	22.2	19.1
Chemical products	23.2	30.7	27.9	25.3
Plastics and rubber products	8.4	8.7	9.3	7.2
Wholesale trade	76.1	66	68.9	50.4
Retail trade	72.1	70.3	63.4	45.5
Transportation and warehousing	80.5	85.4	91	73.6
Information	110.5	118.8	113.3	97.8
Finance and insurance	138	153.4	136.2	105.2
Real estate and rental and leasing	903.2	761.3	573.3	416.1
Professional, scientific, and technical services	84.7	86.7	85.2	79.6
Management of companies and enterprises	34.1	47.2	61.2	52.4
Administrative and waste management services	29.5	27.6	24.6	21.1
Educational services	23.3	25.6	28.2	26.7
Health care and social assistance	110.2	124.1	130.8	125.3
Arts, entertainment, and recreation	17.6	21.4	20.5	16.1
Accommodation and food services	40.1	47.7	51.6	39.7
Other services, except government	20.7	21.7	20.4	17
Source: U.S. Department of Commerce, Bureau of Economic Analysis, Fixed Assets Tables, Table 3.7ES				

EPA Regulation of GHGs and the Hurdle Rate for New Investment

- **Impact of Uncertainty on the Hurdle Rate for New Investment**

19. As mentioned above, the business community currently faces uncertainty on many fronts. It is well known that uncertainty, from whatever the cause, increases the risk of an investment and raises the "hurdle rate" that a project must earn. As noted in a recent article by Jon Tucker in QFinance,[1] the "hurdle rate" is the required rate of return on investment, above which an investment project is worth pursuing. The starting point for the hurdle rate is, then, the company's cost of capital (its costs for the funds required for its investments) to which a company may then decide to make some adjustment for that project's specific risk, by adding a risk premium. As a general rule, the company should consider investing in projects that generate returns which are higher than the company's hurdle rate. Further, the hurdle rate should be higher for riskier projects than for safer projects. When evaluating a prospective investment, analysts typically add a risk premium to the cost of capital, ranging from 0 to 50 % and higher[2].

20. Large projects are often scrutinized more carefully than smaller projects, given their more material impact on the company's cash flows, and a premium for risk is added to the cost of capital figure to arrive at an appropriate hurdle rate. Most companies add a premium over and above the domestic project hurdle rate for foreign investments. New projects are more risky than existing projects, and should therefore reflect a premium over and above the observed earnings yield of an existing project investment. Ventures such as mergers are more risky still, and thus their returns should exceed a much higher hurdle rate before being sanctioned. A recent survey of energy companies by AON Analytics found that regulatory uncertainty is one of the largest risk factors facing new capital investments.[3] Given the uncertainty surrounding EPA's approach to GHG permits, not knowing what BACT requirements may be or how much they will cost to implement and significant project delays, possibly of several years, in the granting of permits under PSD and Title V, it is virtually certain that risk premiums for investments by entities which may fall under EPA's GHG regulations will increase significantly. Other sources of uncertainty arise from not knowing if a permit will be challenged by an advocacy or NIMBY group or if the tailoring rule will be implemented in a timely manner in any given permitting jurisdiction, or if the tailoring rule may later be struck down by the court, leading to retroactive application of the lower permitting thresholds in the CAA. As a result, the "hurdle rate" or required rate of return on investment by a regulated entity increases. The higher the hurdle rate, the fewer investment projects will qualify with the result that growth in U.S. GDP and employment will be negatively impacted.

21. However, the economic effects of uncertainty do not stop with regulated entities; non-regulated sectors will also see their hurdle rates for new investment rise. This effect stems from the fact that many non-regulated firms supply goods and services to regulated firms. If their

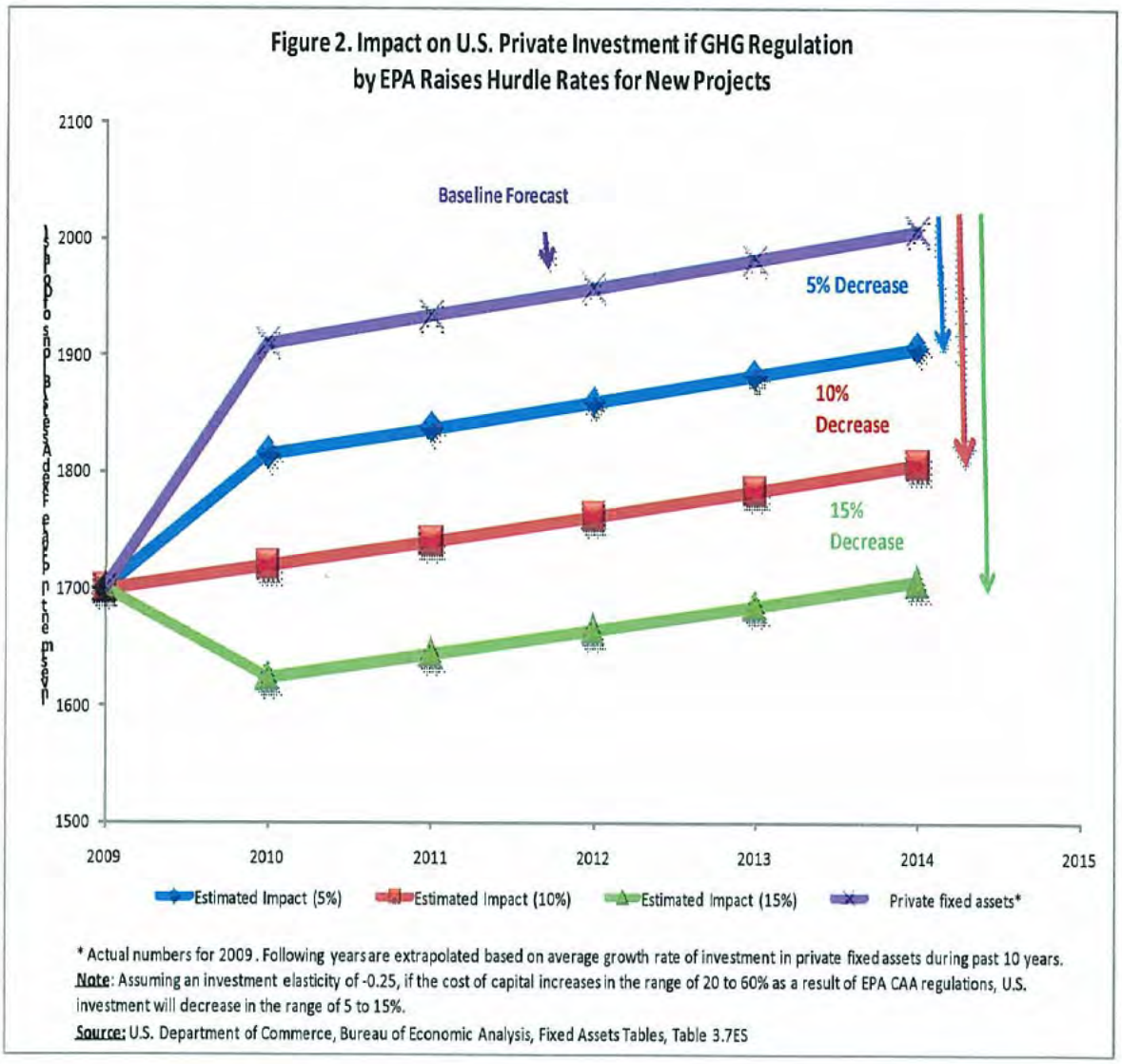
[1] Jon Tucker, "How to Set the Hurdle Rates for Capital Investments," QFinance, http://www.qfinance.com/contentFiles/QF02/g26fs3i7/16/0/how-to-set-the-hurdle-rate-for-capital-investments.pdf .
[2] Hans J. Lang and Donald N. Merino, The Selection Process for Capital Projects, New York" J.Wiley & Sons, 1993.
[3] AON Analytics, "2010 U.S. Industry Report: Energy," http://img.en25.com/Web/AON/Aon%20Analytics%20Energy%20Industry%20Report%20Final.pdf .

regulated customers can not move forward with a planned investment due to permitting delays, the unregulated firms will find their own sales and investment plans impacted, albeit indirectly, by the regulation of GHGs by EPA. They too will experience an increase in the hurdle rate required for new investment because of the uncertainty faced by their regulated customers. As a result, the negative effects on investment of EPA's permitting requirements for regulated entities will be felt economy-wide.

- **Higher Hurdle Rates Will Slow U.S. Investment**

22. The impact of the response of business capital formation to the user cost of capital has been analyzed multiple times in the field of public finance. Three widely cited papers provide a range of estimates for the elasticity of investment to the user cost of capital. Gilchrist and Zakrajsek find that a 1 percentage point increase in the cost of capital implies a reduction in the rate of investment of 50 to 75 basis points and a long run reduction of 1% in the stock of capital.[4] Cummins, Hassett and Hubbard[5] also found a relatively high elasticity (-0.66) but Chirinko, Fazzari and Meyer's[6] found a more conservative result (-0.25). In other words, according to the third study, a 1% increase in user cost of capital means a 0.25% decrease in investment. I estimate the current cost of capital for low risk investments is around 6%. However, for investments by entities that will face permitting requirements under EPA's GHG regulations, a substantial risk premium ranging from 30% to 40% would be appropriate. Assuming that the new regulations will increase the cost of capital for firms in many industries besides those classified as energy intensive, from a current average of 6.0 % to as high as approximately 8.5% (or by 40%) and using the more conservative lower elasticity number (-0.25), I estimate that U.S. investment could decrease by between 5% to 15% (see **Figure 2**). The increase in capital costs is likely to result in a reduction in private investment in the U.S. of between $97 and $290 billion dollars in 2011 and $100 to $301 billion dollars in 2014. Losses in private investment of this magnitude would rival those the U.S. experienced since the fourth quarter of 2007.

[4] Simon Gilchrist and Egon Zakrajsek, "Investment and the Cost of Capital: New Evidence from the Corporate Bond Market," NBER Working Paper 13174, June 2007.
[5] Jason G. Cummins, Kevin A. Hassett, and R. Glen Hubbard, "A Reconsideration of Behavior Using Tax Reforms as Natural Experiments." *Brookings Papers on Economic Activity*, 1994, no. 1, pp. 1-72.
[6] Robert S. Chirinko, Steven M. Fazzarri, and Andrew P. Meyer, "How Responsive is Business Capital Formation to its User Cost? An Exploration with Micro Data?" *Journal of Public Economics* vol. 74 (1999), pp. 53-80.



- **Impact of the Permitting Process on U.S. Investment and Economic Recovery**

24. EPA's GHG permitting process will cause three distinct economic burdens on regulated entities: (1) the cost of obtaining the permits, (2) a higher cost of capital for improvements and new investment due to delay caused by having to wait an unspecified length of time (perhaps years) to obtain permits and (3) the costs of BACT.

25. If the Tailoring Rule is upheld, and using data on the cost of the current PSD program, EPA estimates the administrative costs to a company of obtaining a PSD permit at $85,000 and that approximately 900 more projects will require PSD permits. The total administrative costs are estimated to be $229 million dollars over the first 30 months of the program. Title V permits are estimated by EPA to cost $46,350 each.[7] Neither of these permitting cost estimates includes the

[7] Regulatory Impact Analysis for the Final Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule (RIA) at 19

fact that EPA has not developed the protocols for GHG permitting nor specified the technologies to be required under BACT. EPA has acknowledged that new sources will face increased administrative costs because it will take longer to "develop control recommendations," and respond to "comments from various stakeholders, [and] from citizens groups to equipment vendors, who will seek to participate in the permit process."

26. In addition to the cost of obtaining PSD and Title V permits, regulated industries will have to incur the cost of changing their production process and/or fuel switching to reduce GHG emissions to meet BACT requirements. No estimates are available from EPA (or from private sources) for the size of these new costs. However, EPA notes that "costs to sources to install BACT controls, while still uncertain at this point, would likely add additional costs across a variety of sources in a sector not traditionally subject to such permitting requirements."[8] Thus, it seems very likely that even if the Tailoring Rule is upheld, regulated industries will face increases in total costs that far exceed EPA's $229 million estimate of obtaining permits. Greater economic burdens on regulated industries will impede the U.S. economic recovery and make it harder to restore strong job growth.

27. If the Tailoring Rule is successfully challenged in court or is not implemented, EPA estimated that the cost of the permits to be $78 billion annually (in addition to the additional cost of new equipment and possible fuel switching required by BACT).[9] Over 6.1 million sources would now be covered by the Title V operating permit program, and require 81,485 new PSD pre-construction permits annually, according to EPA.[10] Each of these newly covered sources is likely to have to pay at a minimum $46,350 per Title V permit,[11] and $85,000 for each PSD permit.[12] EPA, however, has estimated that the largest subset of these newly covered sources (residential sources) would only incur a cost of $59,000 per-PSD permit and $23,200 per Title V permit.[13] The smaller estimate is based on EPA's assumption that permits will be less costly and less complicated for smaller residential sources; their estimate of an imposed cost of $78 billion annually is based on these lower figures. EPA has also admitted that "the extraordinarily large number of permit applications would overwhelm permitting authorities and slow their ability to process permit applications to a crawl."[14] EPA cited state estimates that a smaller increase in permitting would "result in permitting delays of 3 years."[15]

28. It is very likely that the issuance of PSD permits would not be able to keep up with the large number of incoming applications and that delays might last many years due to a shortfall in permitting authority resources. PSD is a preconstruction program, thus tens of thousands of regulated entities would be prevented from constructing or modifying over the next 5 to 10 years. Many projects would likely never be undertaken, resulting in a slowing of construction(and of economic and job growth) for years. *Id.*

[8] Tailoring Rule, 75 Fed. Reg. at 31,534.
[9] RIA at 18
[10] Tailoring Rule, 75 Fed. Reg. at 31,540
[11] RIA at 35
[12] Tailoring Rule, 75 Fed. Reg. at 31,534
[13] Tailoring Rule, 75 Fed. Reg. at 31,534
[14] Tailoring Rule, 75 Fed. Reg. at 31,557
[15] Tailoring Rule, 75 Fed. Reg. at 31,557

29. In addition, in its final rule, EPA has made clear that if any further sources were subject to PSD permitting, it would be infeasible: "EPA believes that the costs to the sources and the administrative burdens to the permitting authorities of PSD and title V permitting will be manageable at the levels in these initial two steps, and that it would be administratively infeasible to subject additional sources to PSD and title V requirements at those times."[16]

- **Cost of Regulating GHGs under the CAA versus Market Based Approaches**

30. It is relevant to explore the cost of regulating GHGs under the CAA with its non-market, "command and control" approach versus market-based approaches because existing information about the cost of those other approaches can be used, by comparison and extrapolation, as a basis for quantifying some of the harms that will occur as a result of EPA's stationary source GHG program. For example, several academic studies suggest that regulating U.S. GHG emissions by non-market standards such as requiring the use of renewable energy or setting technical standards that firms or entities must comply with and requiring changes in technology for stationary and mobile sources will be far more expensive per ton of CO2e reduced than would employing other approaches like a carbon tax or a cap and trade system.

31. EPA itself has repeatedly noted that legislation setting emission limits would be preferable to the "command and control" approach of the CAA. For example, Administrator Jackson acknowledged this in a May 14, 2009 letter to Senator Inhofe, stating: "Legislation regarding the reduction of greenhouse gases is the preferred approach—it allows for, among other things, the development of an economy-wide cap and trade program, which the Administration supports." Administrator Jackson also specifically endorsed a statement from EPA's Advanced Notice of Proposed Rulemaking on GHGs which emphasized the "complexity and interconnections inherent in CAA regulation of GHGs," and concluded that they "reflect that the CAA was not specifically designed to address GHGs and illustrate the opportunity for new legislation to reduce regulatory complexity." See ANPR at 73 Fed. Reg. at 44,397.

32. Academic research supports EPA's conclusion that regulating GHGs with a non-market approach is not desirable. For example, an economic analysis in the Energy Journal finds that "at an aggregate GHG reduction of five percent we find that costs are more than 10 times higher when fuel economy standards and a renewable portfolio standards for power plants are imposed…"[17] A Heartland Institute analysis also finds that sector-based regional, non-market policies would be ten times more expensive than a uniform federal policy setting emission limits.[18]

33. Many academic and government studies show that reducing GHGs with a cap and trade approach (the policy deemed more efficient and less costly than the non-market approach) is itself quite costly in terms of U.S. economic and job growth. For example, in recent analyses of

[16] RIA at 6.
[17] William Pizer, Dallas Burtraw, Winston Harrington, Richard Newell, James Sanchirico, " Modeling Economy-wide vs Sectoral Climate Policies Using Combined Aggregate-Sectoral Models", The Energy Journal, Vol.27, No.3., page 165.
[18] Joseph L. Bast, James M. Taylor and Jay Lehr, "State Greenhouse Gas Programs: An Economic and Scientific Analysis, 2003, Chicago: Heartland Institute.

the Kerry-Lieberman bill (the American Power Act), the American Council for Capital Formation/Small Business Entrepreneurial Council analysis and the U.S. Department of Energy's Energy Information Administration show losses of GDP in 2030 of 0.3% to 1.7% and job losses of 310,000 to 1,900,000 compared to the "business as usual" baseline forecast (see **Table 2**).[19] It should be noted that the assumptions in EIA's limited new technology are very similar to those in the ACCF/SBEC and the results are also quite similar (a loss of 1.7% of GDP in 2030 compared to the baseline forecast). The ACCF/SBEC analysis shows that U.S industrial output declines by between 4.9% and 5.8% by 2030 and manufacturing employment falls by as many as 700,000 jobs in 2030. The estimates of the impact on jobs and GDP growth of the Kerry-Lieberman bill provide a lower bound for the costs of similar reduction targets that EPA may require under the CAA.

Table 2. Summary of Key Macroeconomic Modeling Results for the Kerry-Lieberman Bill: 2030

	Allowance Prices (2009$ per metric ton)	GDP Impact (% Change from BAU)	Impact on Jobs (Change from BAU)
ACCF/SBEC Low Cost	$100	-1.30%	-1,400,000
ACCF/SBEC High Cost	$118	-1.70%	-1,900,000
EIA-NEMS Basic	$52*	-0.30%	-310,000
EIA-NEMS Limited/No Int.	$145*	-1.70%	-1,470,000
* $2008 per metric ton			

Sources: 1. "Analysis of the Kery-Lieberman Bill "The American Power Act of 2010" Using the National Energy Modeling System (NEMS/ACCF-SBEC)", A Report by the American Council for Capital Formation and The Small Business and Entrepreneurship Council, Analysis Conducted by SAIC, 2010.

2. "Energy Market and Economic Impacts of the American Power Act of 2010", U.S. Energy Information Administration, July 2010.

- **Impact of EPA Regulation of GHGs on Small Business**

34. If the Tailoring Rule is not upheld or implemented, small businesses are operating "at risk". In a December 24, 2009 letter to EPA, the National Federation of Independent Business (NFIB), which represents 350,000 independent business owners, stated that many question the EPA's legal authority to alter the statutory floor of 100/250 tpy for emissions. NFIB notes that:

> It is estimated that absent the Tailoring Rule, millions of sources, including hundreds of thousands of small businesses, would face years of delay in carrying out their plans for constructing or modifying their businesses as they wait to receive permits. Such delays

[19] "Analysis of the Kerry-Lieberman Bill "The American Power Act of 2010" Using the National Energy Modeling System (NEMS/ACCF-SBEC)", A Report by the American Council for Capital Formation and The Small Business and Entrepreneurship Council, Analysis Conducted by SAIC, 2010. "Energy Market and Economic Impacts of the American Power Act of 2010", U.S. Energy Information Administration, July 2010.

would hinder their economic growth.[20] For instance, without the Tailoring Rule, the following would be regulated as stationary sources:[21]

1 million commercial buildings
200,000 manufacturing operations
20,000 large farms

Few if any of these small businesses have previously been subject to the PSD program's onerous permitting requirements.

35. The U.S. Small Business Administration's Office of Advocacy noted in its letter to EPA on December 23, 2009 that "the regulations will have a significant economic impact on a substantial number of small entities". SBA also observed that under the Regulatory Flexibility Act, EPA was thus obligated to convene a Small Business Advocacy Review Panel prior to proposing the rules.

Leakage and U.S. Competitiveness: Impact of EPA's GHG Permitting Requirements

- **Energy Prices and U.S. Job Growth and Competitiveness**

36. As mentioned above, EPA's requirement that entities in industries such as mining, manufacturing, utilities, and construction obtain PSD and Title V permits for new investments is very likely to raise both non-energy and energy related costs of production just as the passage of mandatory GHG emission targets would. The results of the macroeconomic analyses on the Kerry/Lieberman bill cited in **Table 2** (above) show that higher energy prices will make it harder to keep the U.S. economic recovery going and to reduce the unemployment rate. Historically, each one percent increase in U.S. GDP growth is accompanied by a 0.2 percent increase in energy use: therefore, the higher the price of energy, the slower the rate of economic recovery. The economic impact of EPA regulation of GHGs of stationary sources is likely to be more severe than if a market-based approach were employed. Therefore, analyses like the one performed on the Kerry/Lieberman bill can be used to benchmark the harm from EPA's Clean Air Act GHG program.

37. One of the factors that cause businesses to locate new investment abroad is policies or market-driven events that raise energy costs or other costs of production. As a result, "leakage" of both jobs and GHG emissions occurs when companies locate new investment outside the U.S. EPA regulation of GHGs will raise production costs for regulated entities similarly to cap and trade systems or carbon taxes. Having to acquire a PSD or Title V permit and implement BACT, which may require new technologies and/or fuel switching will mean that per unit cost of production rise just as they do under a GHG emission limit such as those in the Kerry/Lieberman American Power Act. In addition, under EPA's GHG permitting requirements, there will be no "border tax adjustments" as there are in recent U.S. cap and trade bills to help

[20] "Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule," 74 Fed. Reg. 206, Oct. 27, 2009.
[21] Portia M. E. Mills & Mark P. Mills, Prepared for the U.S. Chamber of Commerce, "A Regulatory Burden: The Compliance Dimension of Regulating CO2 as a Pollutant," September 2008.

energy intensive industries adjust to higher production and energy costs. The threat of "leakage" of jobs as well as GHG emissions when mandatory restrictions or a cap and trade system are put in place is described in a recent Brookings Energy Security Initiative analysis.[22] [Even though the Brooking analysis focuses on thee impact of a cap and trade bill on leakage of carbon emission and jobs, it is relevant for understanding how EPA's regulation of GHGs will affect leakage. EPA's PSD and Title V permitting requirements will raise production and energy costs just as would a GHG cap and trade system. The Brookings study concludes that:

> Pricing carbon emissions, either through a cap-and-trade system or an emissions tax, will not only adversely affect electricity and primary energy producers, but it will also hurt the competitive performance of heavy fossil-fuel users in downstream industries, especially in trade-exposed sectors such as steel and chemicals.
>
> This gives rise to two overarching concerns. First, a small but prominent subset of domestic companies may be disproportionately burdened if carbon mitigation policies affect their operations but not those of their international competitors. Second, some of the environmental benefits might be eroded if increases in US manufacturing costs from uneven international carbon pricing caused economic activity to shift to nations with weaker greenhouse gas mitigation policies or none at all[23].

38. A real world example of the effect that increased energy prices have on U.S. industry and employment can be observed by examining trends over the past several years in the U.S. chemical industry. As noted recently in Chemical & Engineering News:

> The chemical industry is the largest energy consumer in the manufacturing sector. Chemical producers are especially reliant on natural gas, using vast quantities both as a source of heat and fuel and as a feedstock in the manufacturing process. But high and volatile natural gas prices in recent years prompted many companies to move their facilities, dollars, and jobs to countries where gas is cheaper, particularly to the Middle East, where prices were a fraction of those in the U.S. From 1997 to 2008, average natural gas prices in the U.S. jumped more than 160%.
>
> Prices have since dropped sharply, but the assessment of many economists is that the change is due largely to a recession-related decline in industrial demand and is likely temporary. In late 2009, the federal Energy Information Administration predicted that natural gas prices would increase modestly this year as the economy improves. ACC{American Chemistry Council} and several industry groups have concluded that the price spikes of the past decade contributed significantly to the nearly 4 million U.S. manufacturing jobs lost since 2000, including 120,000 in the chemical industry.[24]

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[22] Carolyn Fischer and Richard Morgenstern, "Designing Provisions to Maintain Domestic Competiveness and Mitigate Emissions Leakage, Brookings Energy Security Initiative, October 2009. http://www.brookings.edu/~/media/Files/rc/papers/2009/10_cap_and_trade_emissions_competitiveness_fischer/10_cap_and_trade_emissions_competitiveness_fischer.pdf.

[23] Fischer and Morgenstern, page 1.

[24] Glenn Hess, "Obama's Energy Plan Stirs Mixed Reaction", Chemical & Engineering News, , May 3, 2010.

Global Environmental Impact of U.S. Regulation of GHGs and GHG Leakage

39. EPA's regulation of U.S. GHGs through the permitting requirements is likely to lead to "leakage" of emissions from the U.S. to other countries, especially developing countries. As students of the issue know, the actions of the U.S. and other developed countries to reduce their own emissions will have very little impact on global emissions without strong participation from developing countries such as China, India, Indonesia and Brazil. As the projections in **Figure 3** show, developed county carbon dioxide emissions are almost flat until the end of this century while developing country emissions are growing exponentially. The Administration and EPA have also recognized the reality of the projected path of global emissions (See **Figure 4**).

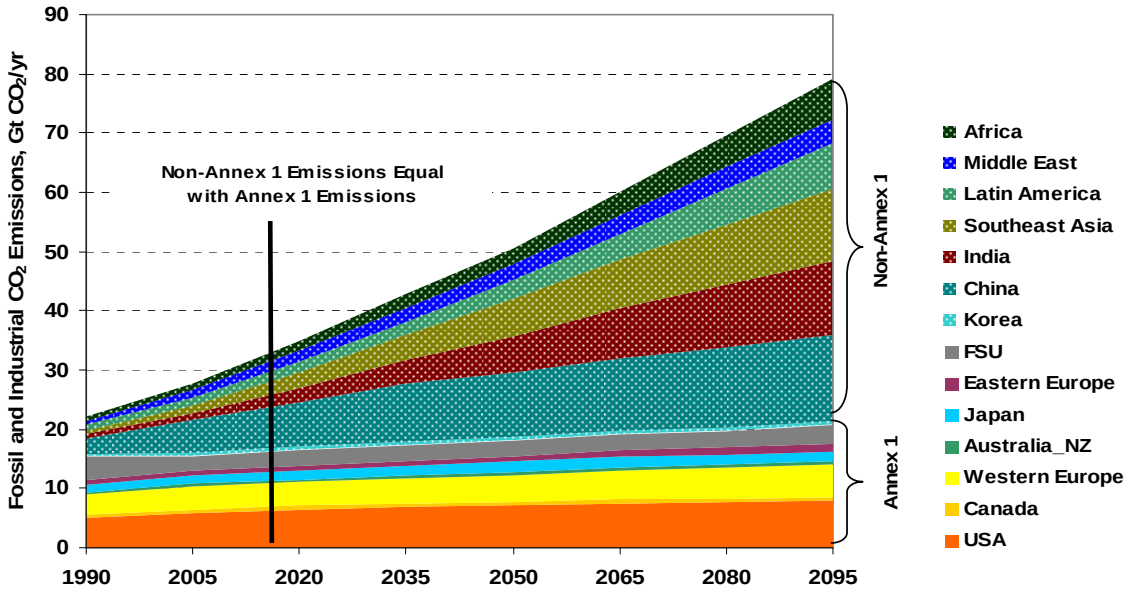
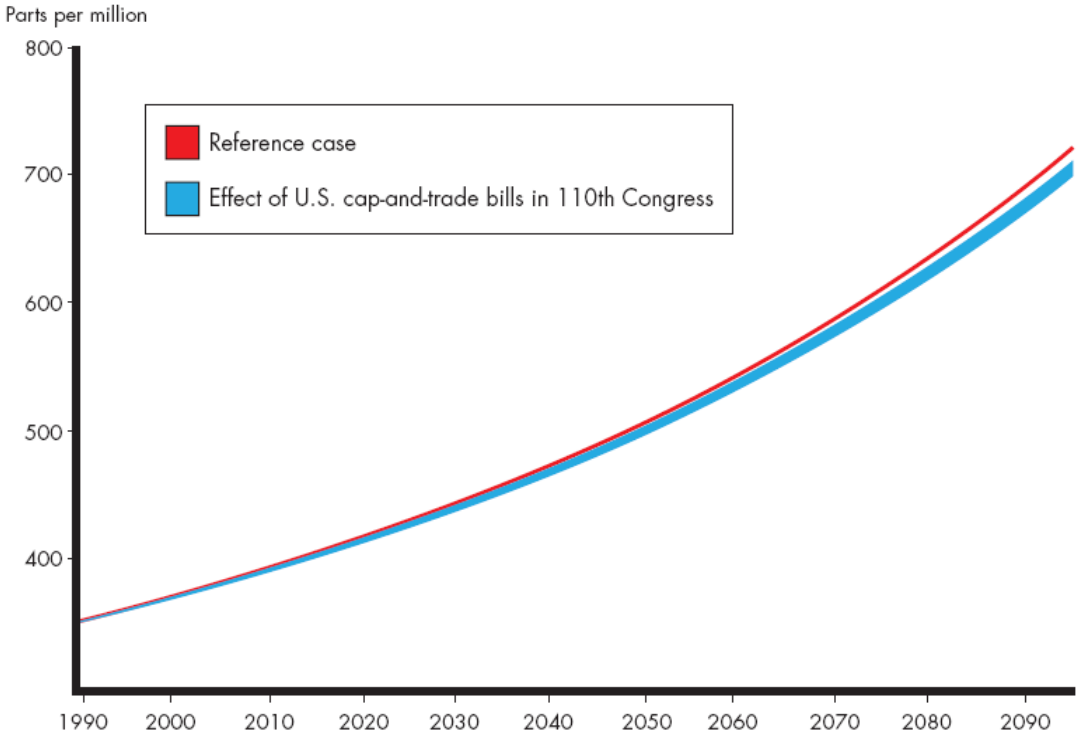


Figure 3. World Carbon Dioxide Emissions
Source: Data derived from Global Energy Technology Strategy, Addressing Climate Change: Phase 2 Findings from an International Public-Private Sponsored Research Program, Battelle Memorial Institute, 2007.

Figure 4. Global CO2 Concentrations:
Carbon emissions are projected to rise over the next several decades

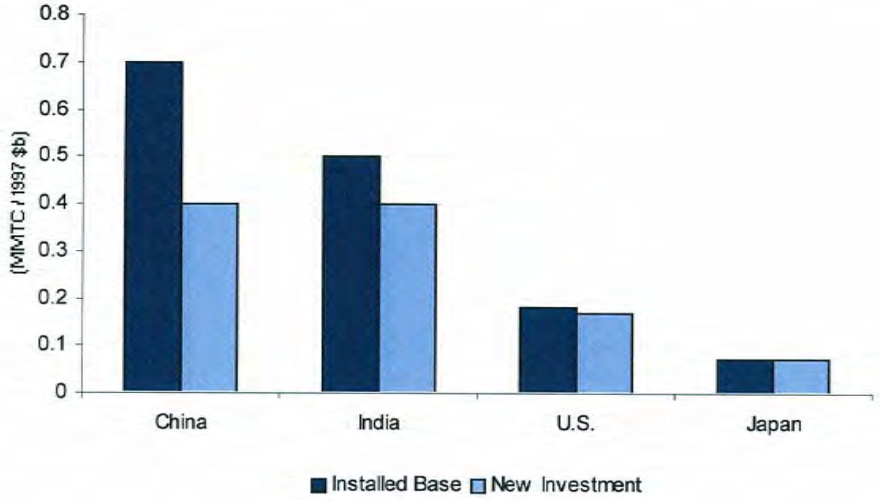


Source: Economic Report of the President, Annual Report of the Council of Economic Advisers, January 2009, Chart 3-6, pg 124.

- **Developing Countries are More Energy Intensive than Developed Countries**

40. Although developing countries are becoming more energy efficient as they add more modern equipment to their capital stock they are still far less energy efficient than the U.S. For example, a 2006 analysis by Drs. David Montgomery and Sughanda Tuladhar of energy use in developing countries found that countries like China, India have far higher emissions per dollar of output than does technology used in the United States; this is true of new investment in countries like China and India as well as their installed base (See Figure 5). The technology embodied in the installed base of capital equipment in China produces emissions at about four times the rate of technology in use in the United States. China's emissions intensity is improving rapidly, but even so its new investment embodies technology with twice the emissions intensity of new investment in the United States. India is making almost no improvement in its emissions intensity, with the installed base and new investment having very similar emissions intensity. India's new investment also embodies technology with twice the emissions intensity of new investment in the United States.

Figure 5: Greenhouse Gas Emissions Associated with Existing and New Investment in 2001 (Million tons of Carbon per $Billion of Gross Domestic Product at Market Exchange Rates)



Source: The Asia Pacific Partnership: Its Role in Promoting A Positive Climate for Investment, Economic Growth and Greenhouse Gas Reductions, W. David Montgomery and Sugandha Tuladhar (see www.iccfglobal.org.)

41. An example of the challenge that developing country GHG emissions pose for policymakers in developed countries is documented in a recent report by the Alliance for American Manufacturing (AAM), "An Assessment of Environmental Regulation of the Steel Industry in China." As the report notes, China is by far the leading source of steel in the world. It produces more than the U.S., Russia and Japan combined. Between 2000 and the end of 2007 China nearly quadrupled its production of steel, and now produces more than one-third of the world's total steel output. Only the world's current economic troubles may now interrupt the industry's rapid growth. China has also become one of the world's biggest polluters. Much of this is due to increased emissions from rapid industrial expansion in steel and other industries, and the fact that China applies less stringent environmental standards than most developed countries to industrial pollution, including pollution from the steel industry. China now produces more sulfur dioxide than any other country in the as well.

42. The report concludes that steelmaking in China clearly poses global environmental concerns. Recent data show that one quarter of the particulate matter in the air in Los Angeles on some days originates in China. China's steel industry now accounts for 50 percent of the world's production of carbon dioxide from steelmaking— approximately equal to all the other steel mills in the world combined.

43. There are also economic considerations, AAM report notes. The Chinese steel industry benefits economically from environmental requirements that are less stringent than those the U.S. and many other countries have adopted. Curtailing pollution requires considerable capital investment and continued spending to operate and maintain pollution control equipment. The failure of many Chinese steel companies to adequately invest in pollution control may have contributed to China's growing strength in markets around the world, including the U.S. market. An economist serving in China's Ministry of Commerce told The New York Times that, with

respect to steel, “the shortfall of environmental protection is one of the main reasons why our exports are cheaper.” Another reason the official cited was cheap energy.

Conclusions

44. The imposition of greenhouse gas permitting requirements on stationary sources will negatively impact U.S. investment, job growth and economic competitiveness. Energy prices and production costs will rise across many industries as a result of the permitting requirements. Specifically, the uncertainty regulated entities will face due to permitting delays, lack of knowledge how EPA will define Best Available Control Technology (BACT), permitting challenges from advocacy groups and lack of certainty that the Tailoring Rule will be upheld contribute to a significant rise in the hurdle rate required for new U.S. investment. Hurdle rates for investment by industries not subject to the permitting rule are likely to increase as well because of the interdependence of the regulated and unregulated sectors of the economy. Higher hurdle rates will decrease U.S. investment (relative to the baseline forecast) and result in slower growth in GDP and employment. In addition, the permitting requirements will also contribute to leakage of carbon emissions and job loss in the U.S. as energy intensive industries shift more production to developing countries whose industries produce more GHGs per unit of output than do those in the U.S. Consequently, it makes little economic or environmental sense for EPA to regulate GHGs under the Clean Air Act.

I, Margo Thorning, declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct to the best of my knowledge. Executed this 14th day of September, 2010.

Margo Thorning