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Impact of social cost of carbon analyses in the development of energy projects on federal land

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ABSTRACT

Pending either legislative action or formal agency guidance, utilization of the Social Cost of Carbon in analyses of energy development projects on federal land under the National Environmental Policy Act (NEPA) is not required. However, current trends indicate that future NEPA documentation of proposed energy projects on federal land will likely address and discuss project impacts on climate change using increasingly quantitative metrics. Accordingly, parties should be prepared to offer substantive comments on the suitability and accuracy of quantitative analyses of the impacts associated with greenhouse gas emissions and offer suggestions for meaningful mitigation measures to reduce such estimates.

1. Introduction

Originally developed for use in rulemaking, the Social Cost of Carbon (SCC) has recently been employed to provide an estimate of the costs associated with climate impacts in environmental analyses of federal land energy projects pursuant to the National Environmental Policy Act (NEPA). This paper discusses the issues associated with the utilization of the SCC in the NEPA documentation process and provides an overview of the litigation and agency guidance on the subject. The paper concludes with suggestions of how stakeholders can prepare for and engage with the U.S. Department of the Interior's Bureau of Land Management (BLM) with respect to the utilization of the SCC in the NEPA process.

Climate policy is implemented based upon assessments of the impacts—both negative and positive—of increasing anthropogenic emissions of greenhouse gases (GHG) that are typically associated with the production and use of fossil fuels such as coal, oil, and natural gas. For decades, economists and policymakers have developed various tools and models to estimate such impacts. One of these methods of assessment—known as the SCC—has since emerged as the hegemonic tool for assessing the costs and benefits of increasing GHG emissions.

Originally developed for use in rulemaking, the SCC has recently been employed to provide an estimate of the costs associated with climate impacts in environmental analyses of western energy projects pursuant to NEPA. This article discusses the issues associated with the utilization of the SCC in the NEPA documentation process and provides an overview of the litigation and agency guidance on the subject.[1] The article concludes with suggestions of how stakeholders can prepare for and engage with the U.S. Department of the Interior's Bureau of Land Management (BLM) with respect to the utilization of the SCC in the NEPA process.

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[1] An advisory note to the reader: This article references the White House Council on Environmental Quality's (CEQ) "Revised Draft Guidance for Greenhouse Gas Emissions and Climate Change Impacts" (hereinafter "Draft CEQ Guidance") *available at*, https://www.whitehouse.gov/administration/eop/ceq/initiatives/nepa/ghg-guidance (last visited Nov. 9, 2015). The reader should be advised of the possibility that the final version of the Draft CEQ Guidance may be available.

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2. The social cost of carbon

The SCC is "an estimate of the economic value of the extra (or marginal) impact caused by the emission or reduction of an additional ton[] of carbon (in the form of carbon dioxide) at any point in time."[2] Utilizing modeling expertise in both atmospheric science and economics, the SCC is calculated by "summing the extra impacts for as long as the extra ton[] remains in the atmosphere—a process which [in turn] requires a model of atmospheric residence time and a means of discounting economic values back to the year of emission."[3] Among the costs SCC is intended to measure are changes in net agricultural productivity, human health, property damages from increased flood risk, and the value of ecosystem services due to climate change.[4] Even among experts, these estimates vary; since 1996 hundreds of SCC values have been published, some of which have been peer-reviewed and others not.[5]

In recent years, the use of computerized climate Integrated Assessment Models (IAMs) have been used to estimate the SCC.[6] IAMs predict how a modeled system behaves given a set of defined assumptions. IAMs are complex and endeavor to synthesize results from various disciplines. For example, an IAM may consider socio-economic factors that lead to GHG emissions, the Earth's carbon cycle, atmospheric chemistry, and the effect of GHG emissions on human beings and the environment. Of necessity, IAMs are based on numerous assumptions; a slight tweak in assumptions or data inputs to the specific IAM model being used can generate a significantly different SCC estimate. The two assumptions in IAM assessments that cause the most uncertainty for SCC estimates are the discount rate[7] and the equity weights that are used to aggregate monetized impacts.

For these and related reasons, the use of IAMs in this context has come under criticism. As one economist noted:

> These models have crucial flaws that make them close to useless as tools for policy analyses; certain inputs (e.g., the discount rate) are arbitrary, but have huge effects on the SCC estimates the models produce; the models' descriptions of the impact of climate change are completely ad hoc, with no theoretical or empirical foundation; and the models can tell us nothing about the most important driver of the SCC, the possibility of a catastrophic climate outcome. IAM-based analyses of climate policy create a perception of knowledge and precision, but that perception is illusory and misleading.[8]

Not surprisingly, the SCC historically has been viewed as a rather crude tool to provide, at best, rough top-level analyses of climate impacts to assess the general direction of climate policymaking.

Table 1
Current SCC estimates, 2015–2050[a] (in 2014 dollar per metric ton of CO_2)[b].

Year	Discount rate and statistic			
	5% average	3% average	2.5% average	3% 95th percentile
2015	$12	$40	$62	$117
2020	$13	$47	$69	$140
2025	$16	$51	$76	$150
2030	$18	$56	$81	$170
2035	$20	$61	$87	$190
2040	$23	$67	$93	$200
2045	$26	$71	$99	$220
2050	$29	$77	$106	$240

[a] The SCC values are dollar—year and emissions—year specific and have been rounded to two significant digits. The 2007$ estimates were adjusted to 2014$ using GDP implicit price deflator (108.289) from the National Income and Product Accounts Tables 1.1.9.

[b] United States Envtl. Prot. Agency, The Social Cost of Carbon (United States Envtl. Prot. Agency 2015), *available at*,http://www.epa.gov/climatechange/EPAactivities/economics/scc.html (last visited August 6, 2015).

Despite the uncertainty associated with modeling climate impacts, the SCC has been adopted into regulatory analyses to meet the requirements of federal executive orders. Executive Orders 12866 and 13565 require agencies to prepare a careful and transparent analysis of the anticipated consequences of economically significant regulatory actions.[9] While neither Executive Order directly addresses climate change or the SCC, in the latter years of the George W. Bush administration some federal agencies endeavored to incorporate SCC analyses into regulatory analyses.[10] In February 2010 a team of interagency federal officials appointed by President Obama—known as the Interagency Working Group, or IWG—developed, with the use of IAMs, and published a technical support document that provides guidance to federal agencies on how to incorporate the social benefits of reducing GHG emissions into cost-benefit analyses of regulatory actions required by Executive Order 12866.[11] The IWG's estimates were revised in May 2013 and July 2015.[12]

The federal government's current SCC estimates are provided in Table 1.

Applying these (and prior) SCC estimates in federal climate-related rulemakings, the U.S. Environmental Protection Agency (EPA) has claimed significant benefits associated with the development and implementation of federal climate regulations without acknowledging the various complexities, limits, and assumptions underpinning the IAMs that are used to make SCC estimates.

In recent years the use of the SCC has expanded beyond its intended use in rulemakings to encompass environmental analy-

[2] Intergovernmental Panel on Climate Change (IPCC) 2007. *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, § 20.6, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK (2007) *available at*, https://www.ipcc.ch/publications_and_data/ar4/wg2/en/ch20s20-6.html).

[3] *Id*.

[4] Michael Greenstone, et al., *Developing a Social Cost of Carbon for US Regulatory Analysis: A Methodology and Interpretation*, 7 REV. ENVTL. ECO & POL'Y 23 (2013).

[5] Parry, et al, *supra* note 3.

[6] Three IAMs in particular are influential and frequently cited: (1) the DICE model (William Nordhaus of Yale University); (2) the FUND model (Richard Tol of Sussex University); and (3) the PAGE model (Chris Hope of Cambridge University); William Nordhaus, *Estimates of the Social Cost of Carbon: Concepts and Results from the DICE-2013R Model and Alternative Approaches*, 1 J. ASS'N ENVTL. & RESOURCES ECONOMISTS 273 (2014).

[7] The discount rate represents the value of money over time.

[8] Pindyck, R.S. *Climate Change Policy: What Do the Models Tell Us?* (No. W19244) National Bureau of Economic Research, 2013, (*available at*, http://web.mit.edu/rpindyck/www/Papers/Climate-Change-Policy-What-Do-the-Models-Tell-Us.pdf) (last visited Aug. 6, 2015).

[9] Exec. Order No. 12866, 58 Fed. Reg. 190 (Oct. 4, 1993) (Agencies must "assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation upon a reasoned determination that the benefits of the intended regulation justify its costs."); Exec. Order No. 13563, 76 Fed. Reg. 14 (Jan. 21, 2011) (Agencies must "use the best available techniques to quantify anticipated present and future benefits and costs as accurately as possible.").

[10] Howard Shelanski, Maurice Obstfeld. Estimating the Benefits from Carbon Dioxide Emissions Reductions, *available at*, https://www.whitehouse.gov/blog/2015/07/02/estimating-benefits-carbon-dioxide-emissions-reductions (last visited August 6, 2015).

[11] *Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866* (Feb. 2010), *available at*, http://www.epa.gov/oms/climate/regulations/scc-tsd.pdf (last visited August 6, 2015); Interagency Working Grp. on Social Cost of Carbon. U.S. Gov't, Response to Comments: Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866 (2015).

[12] Interagency Working Grp. on Social Cost of Carbon, U.S. Gov't, *Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866* (2015).