

*Colorado Legislative Council Staff Fiscal Note*

**STATE  
FISCAL IMPACT**

**Drafting Number:** LLS 15-0458  
**Prime Sponsor(s):** Rep. Foote

**Date:** April 17, 2015  
**Bill Status:** House SVMA  
**Fiscal Analyst:** Marc Carey (303-866-4102)

**BILL TOPIC:** SOCIAL COST OF CARBON IN CERTAIN FISCAL NOTES

<b>Fiscal Impact Summary*</b>	<b>FY 2015-2016</b>	<b>FY 2016-2017</b>	<b>FY 2017-2018</b>
<b>State Revenue</b>			
<b>State Expenditures</b>		<b>\$68,706</b>	<b>\$19,757</b>
General Fund		58,798	16,800
Centrally Appropriated Costs**		9,908	2,957
<b>FTE Position Change</b>		0.7	0.2
<b>Appropriation Required: None</b>			

\* This summary shows changes from current law under the bill for each fiscal year.

\*\* These costs are not included in the bill's appropriation. See the State Expenditures section for more information.

**Summary of Legislation**

Beginning January 1, 2017, this bill requires Legislative Council staff (LCS) to include an estimate of the social cost of carbon in the fiscal note for certain electricity generation measures. The bill specifies that the social cost of carbon consists of:

- an estimate of the increase or decrease in carbon emissions that results from the measure; and
- a monetization of the change in carbon emissions, which may be expressed as a range.

The bill defines "electricity generation measures" as any bill or concurrent resolution expected to cause a significant increase or decrease in the generation of electricity from a renewable or nonrenewable source by or on behalf of a qualifying retail utility subject to Colorado's renewable energy standard. The bill requires executive agencies to cooperate and share relevant information with LCS to support the preparation of these social cost of carbon estimates.

**Background**

In order to perform the required analysis, LCS anticipates using the Environmental Protection Agency's AVERT model to estimate the change in emissions, and the Social Cost of Carbon (SCC) estimates produced by the federal Office of Management and Budget to assess federal regulations that potentially impact carbon emissions. Each of these are discussed briefly below.

**Avert Model.** The AVERT (Avoided Emissions and genERation Tool) model operates in an Excel spreadsheet environment, and is available for free download from the Environmental Protection Agency's web site. The model allows users to simulate county-level emissions changes at electric power plants by the enhancement (or reduction) of renewable energy or energy efficiency programs. The quantification of emissions changes is estimated through changes in electricity demand under various policy scenarios. Thus, the impact of legislation that changed (up or down) Colorado's renewable energy standard or reduced overall demand through imposition of an energy efficiency requirement could potentially be assessed. The AVERT model only estimates changes in carbon dioxide (CO<sub>2</sub>) emissions, and not other greenhouse gases such as methane and nitrous oxides emitted during generation. In addition, AVERT is a regional as opposed to a state-level model. While the majority of the Rocky Mountain region defined in the AVERT model is Colorado, regional estimates would have to be scaled appropriately to conform to state boundaries.

**Social Cost of Carbon (SCC).** The SCC is an estimate of the economic damages/benefits associated with a small increase/decrease in CO<sub>2</sub> emissions, conventionally measured in metric tons, in a given year. The SCC is meant to be an estimate of climate change damages/benefits, and includes, among other things, changes to agricultural productivity, human health, and property damage due to increased flooding over a time period of 200-300 years. While the estimates omit several types of climate impacts (including effects on fisheries, effects of increased pest and fire pressures on forests and agriculture, among others), they also include benefits to carbon emissions, including increased agricultural yields.

Estimates were developed by an interagency workgroup convened by the Council of Economic Advisors and the Office of Management and Budget and currently used in federal regulatory analysis. The working group consists of twelve federal agencies, and the estimates are based on three integrated assessment models: the DICE model (Yale University), the FUND model (Sussex University) and the PAGE model (Cambridge University). The working group periodically updates SCC estimates as new scientific and economic information becomes available.

Averaging results across models, the working group produced three different SCC estimates in 2013. Estimates vary depending on the discount rate used and range from \$11 to \$57 for a ton of carbon emitted in 2015. The central estimate, \$37 per ton, assumes a three percent discount rate. This estimate is expressed in 2007 dollars, which translates to around \$40 in today's dollars. Estimates increase over time as the amount of carbon in the atmosphere increases and the effects of climate change intensify.

**State Expenditures**

This bill will result in additional expenses of \$68,706 and 0.7 FTE in FY 2016-17 and \$19,757 and 0.2 FTE in FY 2017-18 and thereafter. These expenses are detailed in Table 1 below.

<b>Table 1. Expenditures Under House Bill 15-1330</b>			
<b>Cost Components</b>	<b>FY 2015-16</b>	<b>FY 2016-17</b>	<b>FY 2017-18</b>
Personal Services		\$54,841	\$15,669
FTE		0.7	0.2
Operating Expenses and Capital Outlay Costs		3,957	1,131
Centrally Appropriated Costs*		9,908	2,957
<b>TOTAL</b>		<b>\$68,706</b>	<b>\$19,757</b>

\* Centrally appropriated costs are not included in the bill's appropriation.

**Legislative Council Staff.** Legislative Council Staff will incur additional expenses totaling \$58,798 and 0.7 FTE in FY 2016-17. This amount will be reduced to \$16,800 and 0.2 FTE on an on-going basis.

The bill requires LCS to analyze certain pieces of legislation after January 1, 2017. To conduct the required analysis, LCS anticipates utilizing the AVERT model to estimate projected changes in carbon emissions at Colorado electric generation units. The full range of federal SCC estimates will then be applied to the emissions change estimates and a range of monetized costs/benefits will be reported. Around July 2016, a senior-level economist will begin to prepare for such analyses. In the first half of FY 2016-17, work will be full time and will involve:

- increasing familiarity with the AVERT model and the data it utilizes;
- increasing familiarity with the assessment models that underlie the social cost of carbon estimates; and
- working with staff at both the Colorado Public Utilities Commission (PUC) and the Department of Public Health and Environment (CDPHE) to coordinate data sharing so the analyses can be completed as efficiently as possible.

Over the last five years, the General Assembly has considered a relatively small number of bills annually that would be eligible for a SCC analyses. Assuming this trend continues, the anticipated workload would decrease to about 0.2 FTE during the 2017 legislative session, and on an on-going basis thereafter.

**Department of Public Health and the Environment (CDPHE).** The CDPHE will be asked to provide information to LCS regarding emissions at electric generation units Colorado and the emissions data utilized by the AVERT model. Given the relatively small number of bills that are assumed to require SCC analysis, the time required for this support is not expected to be significant, and can be absorbed within existing appropriations.

**Department of Regulatory Agencies, Colorado Public Utilities Commission (PUC).** The PUC will be asked to provide information to LCS regarding electricity generation and capacity at electric generation units in Colorado to confirm assumptions in the AVERT model. Given the relatively small number of bills that are assumed to require SCC analysis, the time required for this support is not expected to be significant, and can be absorbed within existing appropriations.

**Centrally appropriated costs.** Pursuant to a Joint Budget Committee policy, certain costs associated with this bill are addressed through the annual budget process and centrally appropriated in the Long Bill or supplemental appropriations bills, rather than in this bill. The centrally appropriated costs subject to this policy are estimated in the fiscal note for informational purposes and summarized in Table 2.

<b>Table 2. Centrally Appropriated Costs Under House Bill 15-1330*</b>		
<b>Cost Components</b>	<b>FY 2015-16</b>	<b>FY 2016-17</b>
Employee Insurance (Health, Life, Dental, and Short-term Disability)	\$5,657	\$1,616
Supplemental Employee Retirement Payments	4,251	1,341
<b>TOTAL</b>	<b>\$9,908</b>	<b>\$2,957</b>

\*More information is available at: <http://colorado.gov/fiscalnotes>

**Effective Date**

The bill takes effect August 5, 2015, if the General Assembly adjourns on May 6, 2015, as scheduled, and no referendum petition is filed.

**State and Local Government Contacts**

Legislative Council Staff

Public Health and Environment

Regulatory Agencies