

October 21, 2019

Before the Public Utilities Commission of the State of Colorado

Proceeding No. 19R-009E

In the Matter of the Proposed Amendments to Rules Regulating Electric Utilities, 4 Code of Colorado Regulations 723-3, relating to Electric Resource Planning, the Renewable Energy Standard, Net Metering, Community Solar Gardens, Qualifying Facilities, and Interconnection Procedures and Standards

**Comments from the Institute for Policy Integrity
on the Interim Decision Proposing Additional Rule Revisions
on the Social Cost of Greenhouse Gases**

The Institute for Policy Integrity at New York University School of Law¹ submits these additional comments on the Commission's additional rule revisions regarding the social cost of greenhouse gases. These comments build on, and incorporate, Policy Integrity's previous comments to the Commission on the social cost of greenhouse gases.² Policy Integrity is a non-partisan think tank dedicated to improving the quality of government decisionmaking through advocacy and scholarship in the fields of administrative law, economics, and public policy.

The Commission should treat the requirements of SB 19-236 as a floor and not a ceiling. To that end, the Commission should rely on its broad authorities and more fully adopt the best practices for monetizing climate externalities. Doing so will best allow the Commission first to compare the climate effects of various alternative plans and proposals submitted by utilities against the costs and benefits of other alternative action options, and then to transparently convey the costs and benefits of the Commission's final decisions to the public.

In particular, the Commission should:

- Base initial, minimum estimates of the social cost of greenhouse gases on the 2016 *Technical Support Document* published by the federal Interagency Working Group, but should allow itself the flexibility to revise those estimates upwards based on future updates that are consistent with best science and economics.
- Require the consideration of the Interagency Working Group's high-impact estimates, in addition to the central estimates, as a sensitivity analysis.
- Specify the dollar-year for the estimates (e.g., 2007\$, versus adjusted for inflation to 2018\$), and clarify how estimates will be updated to account for future inflation.
- Specify that the discount rate applied to translate the future monetized value of emissions back to present value must be the same discount rate as used to calculate the underlying social cost of greenhouse gas estimates themselves.
- Adopt an initial, minimum set of estimates for the social cost of greenhouse gases in conjunction with finalization of these rule revisions, rather than waiting until November 2020 to finalize the first set of calculations.
- Require, when relevant, consideration of the social cost of methane in addition to the social cost of carbon, and base estimates of the social cost of methane on the 2016 *Addendum* published by the federal Interagency Working Group. The social cost of methane may provide important and additional information relevant to the Commission's decisions when assessing, for example,

¹ No part of these comments purports to present the views, if any, of New York University. Note that while Policy Integrity is based at New York University, our legal director, Jason Schwartz, lives and works in Denver, Colorado.

² See especially Policy Integrity's March 29, 2019 Comments, https://policyintegrity.org/documents/Electric_Rule_NOPR_Initial_Comments_on_SCC_2019.3.29.pdf.

the climate effects of beneficial electrification of heating, or when considering the upstream emissions of electric resource portfolio options.³

- Retain the flexibility to require use of the social cost of greenhouse gases in additional proceedings.

These comments will next expand on these recommendations by walking through some issues raised by the proposed rule revisions. The comments also refer to several tables, included in an attached spreadsheet, that emphasize the importance of specifying the dollar-year, the growth rate, and the discount rate. The comments conclude by recommending new rule language, in redline format.

Issues with the Proposed Rule Revisions

Rule 3551(b): The proposed rule revisions build from SB 19-236’s list of required proceedings to clarify when the social cost of greenhouse gases should be used. However, the list offered in the proposed Rule 3351(b) raises at least two issues: (1) when is the social cost of methane, in addition to the social cost of carbon, necessary to facilitate comparisons between alternatives in the specified proceedings?, and (2) is the list exhaustive?

In several of the specified proceedings, the social cost of carbon by itself may not be sufficient to allow a fully rational and transparent comparison of the alternative climate consequences of various action options. For example, beneficial electrification of water heating or space heating may involve moving from direct combustion of natural gas to electricity generated by renewable resources. In such a comparison, the upstream methane emissions involved in the production, processing, and transportation of natural gas, as well as leakage during combustion, may be a key point of comparison. More broadly, when comparing any resource portfolios that involve coal- or gas-fired generation against renewables, upstream methane emissions from production, processing, and transportation may be important. Requiring the application of the social cost of methane not only will ensure that such upstream or leaked methane emissions are given due weight in the decisionmaking, but is also a more accurate approach to valuing the climate externalities of methane than simply converting methane emissions into carbon dioxide-equivalent units using the relative global warming potentials of the two gases.⁴ Therefore, the Commission should require use of the social cost of methane when relevant, and should more broadly refer in its rules to “the social cost of greenhouse gases” generally, instead of just the social cost of carbon. The Commission should base its estimates of the social cost of methane on the 2016 estimates from the federal Interagency Working Group’s *Addendum*.

The list of specified proceedings makes clear that, at least with respect to the acquisition of new resources, the list is not exhaustive, saying that covered proceedings “includ[e]” but are “not limited to” the six identified in the rule. The Commission should adopt that language more broadly, to retain for itself the flexibility to require use of the social cost of greenhouse gases in additional proceedings when deemed relevant.

Rule 3552(a): The proposed rule revisions specify that the social cost of greenhouse gases shall be “equal” to “the” estimates developed by the federal government. There are several concerns with this language. First, the federal Interagency Working Group did not provide a single (i.e., “the”) set of

³ More generally, when comparing alternatives that involve natural gas or coal against alternatives that do not, the social cost of methane may be an important and relevant tool for analysis.

⁴ For example, methane is roughly 86 times more potent in terms of radiative-forcing potential than carbon dioxide on a ton per ton basis. But it is more accurate to apply each greenhouse gas’s own social cost metric, rather than converting non-carbon gases into CO₂-equivalent units by using the relative global warming potentials of gases, because the individual metrics better reflect the damages associated with each gas’s unique atmospheric chemistry.

estimates: it provided four sets of estimates, including a “central” set of estimates based on a 3% discount rate; a “high-impact” set of estimates that serves as a proxy for key damages omitted from the central estimates, including catastrophic damages; and two additional sets of estimates that test sensitivity to alternate discount rates (2.5% and 5%). The Interagency Working Group strongly “emphasize[d] the importance of considering all four...values,”⁵ and some states are giving special attention to estimates besides the central values. For example, Washington now requires its utilities to use the estimates calculated at the 2.5% discount rate,⁶ and the state has long expressed a preference for those estimates calculated at the 2.5% discount rate, in order to “anticipate additional external costs,” to better reflect an appropriate intergenerational discount rate, and to be a state leader on climate change, among other reasons.⁷ Similarly, the California Public Utilities Commission recently adopted an order that requires use of both the Interagency Working Group’s central estimates and the high-impact estimates in assessing the cost-effectiveness of distributed energy resources.⁸ A Staff Report prepared in that proceeding had in fact recommended favoring the high-impact values, because many of the climate damage categories most relevant to California’s electricity infrastructure and economy—such as wildfires, thermal efficiency decreases, wind turbine efficiency effects, and overheating of electricity system components—are not fully incorporated into the central estimates of the social cost of carbon; consequently, the initial ruling of an administrative law judge had found “that *the high impact value is the more appropriate and defensible estimate.*”⁹ The Colorado Public Utilities Commission should similarly require consideration not just of the central estimates, but also of either the high-impact estimates, the 2.5% discount rate estimates, or both, as sensitivity analyses.

Second, the 2016 estimates from the Interagency Working Group are not technically the most recent estimates produced by the federal government, though they are the most recent estimates consistent with best science and economics. Policy Integrity’s previous comments to the Commission in this proceeding explained why the so-called “interim” estimates produced in recent years by federal agencies during the Trump administration would not be appropriate for Colorado to use, as they are not consistent with best science and economics. However, in the future, the Working Group’s 2016 estimates could be updated in ways that would be consistent with best science and economics, and the Commission should have the flexibility to follow those updates. One possibility is that the federal Interagency Working Group is reconstituted in the future and begins again to follow the recommendations of the National Academies of Sciences on how to update its estimates. Another possibility is that, in the absence of future federal updates based on the best science and economics, a collaboration of state governments, academics, and nonpartisan institutions could undertake a future update.¹⁰ In such situations, the Colorado Public Utilities Commission should be free to follow the best science and economics, rather than remaining forever tethered to (i.e., “equal to”) past estimates from the federal government.

Rule 3552(a)(i): The proposed rule revision specifies that, starting in 2020, the social cost of carbon dioxide must be at least \$46.00 per short ton. That is consistent with the floor set by SB 19-236, but the

⁵ Interagency Working Group, *Technical Update of the Social Cost of Carbon 4* (2016) [hereinafter 2016 Technical Update].

⁶ Wash. Sen. Bill 5116 § 15 (2019).

⁷ Wash. Dept. of Commerce, *The Social Cost of Carbon: Washington State Energy Office Recommendation for Standardizing the Social Cost of Carbon When Used for Public Decision-Making Processes* (2014), <http://www.commerce.wa.gov/wp-content/uploads/2015/11/Energy-EV-Planning-Social-Cost-of-Carbon-Sept-2014.pdf>.

⁸ Before the Cal. PUC, 19-05-019, Decision Adopting Cost-Effectiveness Analysis Framework Policies for All Distributed Energy Resources (May 16, 2019), <http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M293/K833/293833387.PDF>.

⁹ Before the Cal. PUC, ALJ’s Ruling Seeking Responses to Questions and Comment on Staff Amended Proposal on Societal Cost Test (Mar. 14, 2018), <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M212/K023/212023660.PDF>.

¹⁰ See, e.g., Resource for the Future, Social Cost of Carbon Initiative, <https://www.rff.org/topics/social-cost-carbon/>.

rule revisions should provide more clarity. This starting figure for year 2020 is clearly intended to be consistent with the Interagency Working Group's central estimate of the social cost of carbon, as published in the 2016 *Technical Support Document*. That document estimated a central value of \$42 per metric ton in 2007\$, as shown in Table 1 in the attached spreadsheet. Converted to short tons, as shown in Table 2 in the attached spreadsheet, that should equal a value of \$38.10 in 2007\$; updating it to 2018\$, for example, by using the Consumer Price Index Inflation Calculator based on data from the U.S. Bureau of Labor Statistics, the central value for year 2020 emissions should actually be \$47.29 per short ton. That is slightly higher than the \$46 per short ton specified by the proposed rule. It is therefore unclear exactly what conversion factor or dollar-year the proposed rule may be assuming for purposes of adjusting for inflation; the figure may be in 2017\$. Meanwhile, the high-impact value for year 2020 emissions should be \$168.29 per short ton in 2018\$. See Table 3 in the attached spreadsheet.

The Commission must specify the dollar-year for the minimum value for year 2020 emissions (i.e., if the minimum value is \$46 per short ton, the dollar-year may be 2017\$; in more-current 2018\$, the minimum value for year 2020 emissions should be \$47.29), or else the value of this minimum estimate will erode over time due to the effects of inflation. Further, the Commission must specify that estimates of the social cost of greenhouse gases must be updated to be presented in the same dollar-year as any other estimates of costs and benefits presented in an application or other submission from a utility.

Rule 3552(a)(ii): The proposed rule revision follows SB 19-236 in requiring the Commission to “modify” the baseline social cost of greenhouse gases for year 2020 emissions by applying an “escalation rate” to calculate estimates for future years. Though these terms do come from the statute, both are somewhat awkward. The Commission should not be “modifying” the estimate for year 2020 emissions to recalculate the social cost of, for example, year 2021 emissions; rather, the Commission should follow the Interagency Working Group's methodology of relying on three peer-reviewed integrated assessment models to directly estimate the social cost of greenhouse gases for each year.¹¹ The 2016 Technical Support Document also does not specify a single “escalation rate” to apply to the central estimates. Instead, after calculating a specific social cost figure for year each, the Working Group calculated as *post hoc* summary statistics the average annual growth rates for various decades.¹² For example, over the years 2020-2030, the central estimate for the social cost of carbon tends to grow about 2.1% per year, while the high-impact estimate tends to grow about 2.3% by year; by the 2040-2050 period, that changes to an average growth rate of about 1.6% per year for both the central and high-impact estimates of the social cost of carbon.¹³ Meanwhile, for the social cost of methane, the growth rate over the 2040-2050 period is 2.5% for the central estimates, and 2.2% for high-impact estimates.¹⁴ The growth rate for the social cost of emissions after the year 2050 could be more or less than those figures; optimally, the rate would come from the models, rather than from some pre-determined growth assumption.

Choosing a single “escalation rate” to apply over a 40-year period to the initial base calculation for year 2020 emissions could lead to significant departures from the actual year-by-year estimates reported by the Interagency Working Group. It would be simpler for the Commission, more consistent with the best

¹¹ IWG, 2016 TSD, at 16 (“The approach taken by the IWG is to compute the cost of a marginal ton emitted in the future by running the models for a set of perturbation years out to 2050.”)

¹² See IWG, *Technical Support Document: Social Cost of Carbon for Regulatory Impact Analysis* 28 (2010) [hereinafter 2010 TSD] (noting that the growth rate comes directly from the results of the models, “rather than assuming a constant annual growth rate as was done for the interim estimates”).

¹³ IWG, 2016 TSD, at 17, table 3.

¹⁴ IWG, *Addendum: Application of the Methodology to Estimate the Social Cost of Methane and the Social Cost of Nitrous Oxide* 8 (2016) [hereinafter Addendum].

practices developed by the Working Group, and still consistent with the instructions from SB 19-236 to simply adopt the Interagency Working Group's entire table of social cost figures as minimum values, rather than requiring the Commission to recalculate a "modified" value for each year.

While the proposed rule revision contemplates the escalation rate for the social cost of greenhouse gas estimates, it does not specify the discount rate to apply to the future costs or benefits calculated by applying the social cost of greenhouse gases. Specifying the discount rate is crucial. For example, if an alternative resource portfolio will reduce emissions, relative to a baseline portfolio, by 1 million short tons of carbon dioxide in the year 2035, to monetize the benefits of those emissions reductions, the first step is to multiply 1 million short tons by the social cost of carbon dioxide for year 2035 emissions: namely, a central value of \$61.93 per short ton (in 2018\$; or a high-impact value of \$189.17). The resulting product—roughly \$62 million—represents the real-world contribution to the reduced risk of agricultural damage, property damage, human health impacts, and so forth, that those 1 million short tons would have caused over the centuries following their emission in the year 2035. By the nature of the Interagency Working Group's central estimate of the social cost of carbon dioxide, those future forgone damages have been discounted back to the year of emissions, in 2035, using a 3% discount rate. However, if the analysis of alternative resource portfolios is being carried out in the year 2020, the future benefits that will occur in the year 2035 still need to be discounted back to the present value, as of the year 2020. That will allow for comparison against other costs and benefits as of the time of analysis. Therefore, those \$62 million in future benefits should be discounted back, also at the 3% discount rate, to the present value in year 2020—which is roughly \$39.7 million. (See the NPV Example tab in the attached spreadsheet).

SB 19-236 specified that "the commission shall use the same discount rate as that used to develop the federal social cost of carbon dioxide." The rule revisions should include similar language, and specify that future monetized climate effects should be discounted at the same rate as used to calculate the underlying social cost of greenhouse gases. That means for a central estimate based on a social cost of carbon that used a 3% discount rate, future climate effects should also be discounted at a 3% rate; if the Commission also uses the Interagency Working Group's 2.5% rate estimates for sensitivity analysis, the future monetized values associated with that sensitivity analysis should be discounted at a 2.5% rate. It would be inappropriate, however, to discount any future climate effects using a discount rate that might apply to private capital or operating costs, which sometimes is calculated as a high as 7%.¹⁵ To avoid the application of such inappropriate discount rates to future climate effects, the rules should specify the correct discount rates.

Rule 3552(b): The proposed rule revisions require the Commission to calculate social cost figures for "the following 40 years." That means that initial calculations would be required out to year 2060. Estimates from the Interagency Working Group currently end with year 2050 emissions. As already explained above, there is no single set of "escalation rates" provided by the Technical Support Documents to apply in the years following 2050. If the Commission does want to calculate social cost figures out to the year 2060, the best option would be to run the integrated assessment models out to year 2060. Barring that, the Commission will need to make a reasonable assumption about how to extend the estimates from the Working Group. One option would be to apply the average annual growth rate that the Working Group calculated for its estimates over the 2040-2050 period: specifically, a 1.6% growth rate for both the central and high-impact estimates of the social cost of carbon, and

¹⁵ See IWG, 2016 TSD, at 17 ("damages from future emissions should be discounted at the same rate as that used to calculate the SC-CO2 estimates themselves to ensure internal consistency"). See Richard L. Revesz et al., Best Cost Estimate of Greenhouse Gases, 357 SCIENCE 6352 (2017) (explaining that a "7% rate based on private capital returns is considered inappropriate because the risk profiles of climate effects differ from private investments.").

2.2%-2.5% for the social cost of methane. Such an assumption could be conservative, as in general the social cost of greenhouse gases “increases over time because future emissions are expected to produce larger incremental damages as physical and economics systems become more stressed in response to greater climatic change, and because GDP is growing over time and many damage categories are modeled as proportional to gross GDP.”¹⁶ Moreover, such growth rates could be conservative simply because all estimates of the social cost of greenhouse gases omit key damage damages, including the risk of future catastrophic damages and tipping points, and so are widely believed to be conservative underestimates, perhaps severely so.¹⁷ Another option would be instead of extending the growth rates that the Working Group calculated *ex post* as summary statistics of the results from the models, to make a reasonable assumption about future growth rates. For example, before the Working Group finalized its first model runs in 2010, its 2009 “interim” estimates of the social cost of carbon assumed *ex ante* that incremental damages over time would grow at 3% per year.¹⁸

Table 4 in the attached spreadsheet calculates estimates of the social cost of carbon out to the year 2060 using a 1.6% growth rate. Table 8 does the same for the social cost of methane, using a 2.5% growth rate for the central estimates after the year 2050, and a 2.2% growth rate for the high-impact estimates.

The attached spreadsheet also shows the analytical value of having estimates out to the year 2060. The “NPV Example” tab of the attached spreadsheet assumes a constant stream of emissions reductions over the period 2020-2060, of 1 million short tons per year. The spreadsheet shows the undiscounted valuation of the benefits of reducing 1 million short tons in each of those years, as well as the net present value for that stream of future benefits, discounted back to year 2020 at a 3% discount rate. The spreadsheet finally shows each individual year’s percent contribution to the total net present value over that entire period. For example, the 1 million short tons reduced in year 2020 will generate a present value of about \$47 million (using the central estimate), which is about 3.1% of the total net present value generated over the 2020-2060 period. By comparison, the same 1 million short tons reduced in the year 2060 will generate a smaller present value, worth only about \$28 million to society today, or about 1.8% of the total net present value. Though the present value of emissions reductions achieved in the year 2060 is of course, by definition, less than the present value of the same emissions reductions achieved sooner, those future reductions definitely still have significant value. To some extent, stopping the analysis in year 2060 is arbitrary. Emissions reductions achieved in the year 2070, for example, will also still have a net present value; on the other hand, the further away from the year 2050 the Commission calculates, the further away it moves from the Interagency Working Group’s methodology.

The Commission should select a timeframe for analysis that balances accuracy in the estimation of quantities of emissions, accuracy in the estimation of the growth rate of the social cost figures, and significance of the net present value given a reasonable discount rate applied over the time frame. If quantities of emissions can be estimated with a sufficient degree of accuracy out to the year 2060, and if the Commission is comfortable with making assumptions about growth rates out to the year 2060, then the year 2060 may be, for now, a reasonable end point for the analytical timeframe.

Rule 3352(b)-(c): The proposed rule revisions suggest that the Commission will recalculate the social cost of greenhouse gases every year by August 1, provide public notice and comment for each new set of calculations, and finalize the estimates by November 1. To begin, there is no reason to wait until

¹⁶ IWG, 2016 TSD, at 16.

¹⁷ See Richard L. Revesz et al., *Global Warming: Improve Economic Models of Climate Change*, 508 *Nature* 173 (2014) (co-authored with Nobel Laureate Kenneth Arrow, among others).

¹⁸ See IWG, 2010 TSD, at 4.

August and November of 2020 to propose and finalize the first set of estimates. The Commission should now, in conjunction with this current proceeding, adopt minimum estimates based on the Interagency Working Group’s 2016 Technical Support Document and Addendum, converted to short tons, adjusted to 2018\$, and extended from the year 2050 to the year 2060 using reasonable growth rate assumptions based on the Working Group’s summary statistics. Tables 4 and 8 of the attached spreadsheet provide those calculations for the social cost of carbon and social cost of methane, which are also included in the redline recommendations below.

It may be helpful to have an annual recalculation process, at least to adjust for inflation every year. However, in many years there will be no substantive changes in the best available estimates of the social cost of greenhouse gases. For example, when the Interagency Working Group was operational, it issued 5 sets of estimates over 8 years, but did not issue new figures every year;¹⁹ meanwhile, the National Academies of Sciences recommended that the federal Interagency Working Group (if and when it reconvenes) may operate on a five-year cycle of updates in the future. On the other hand, providing an annual opportunity for public comment would allow stakeholders to point the Commission in the direction of other updates consistent with best science and economics, such as updates possibly undertaken in the future by other states in the event that the federal Interagency Working Group does not reconvene. So long as the Commission recognizes that a substantive update may not be necessary every year, an annual process to revisit the numbers may be appropriate to adjust for inflation and to allow the public to weigh in on any recent developments in the best available estimates.

Redline Changes to the Proposed Rule Text

COST OF CARBON DIOXIDE GREENHOUSE GAS EMISSIONS

* * * *

3551. Overview and Purpose

(a) The purpose of this rule is to establish the cost of ~~carbon dioxide greenhouse gas~~ emissions pursuant to § 40-3.2-106, C.R.S.

(b) All utilities shall consider the cost of ~~carbon dioxide greenhouse gas~~ emissions, as determined by the Commission in accordance with rule 3552, when determining the cost, benefit, or net present value of any plan or proposal submitted by the utility ~~in relevant proceedings as specified by the Commission, including but not limited to in one of~~ the following proceedings:

* * * *

3552. Calculation of the Cost of Carbon Dioxide Greenhouse Gas Emissions

(a) ~~The cost of carbon dioxide emissions shall be equal to the social cost of carbon dioxide emissions developed by the federal government.~~ Utilities and the Commission shall use the best available estimates of the global social cost of greenhouse gases, consistent with the best available science and economics.

(l) Utilities and the Commission shall use as minimum values for the social cost of greenhouse gases the central “3% average” estimates for the applicable year of emissions as listed either in Appendix A, Table A1, of the *Technical Update on the Social Cost of Carbon*, or in Appendix Add-A, Table A1 of the *Addendum on Application of the Methodology to Estimate the Social Cost of Methane and the Social Cost of Nitrous Oxide*, as published in August 2016 by the federal Interagency Working Group on the Social Cost of Greenhouse Gases, except that the values shall be updated for inflation to be

¹⁹ See <https://obamawhitehouse.archives.gov/omb/oira/social-cost-of-carbon> (listing updates in 2010, 2013, 2015, and 2016; there was also an interim estimate issued in 2009).

expressed in dollars current to the year of analysis.

(II) Utilities and the Commission shall further conduct a sensitivity analysis using as minimum values for the social cost of greenhouse gases the “high-impact” estimates provided in the Tables from the Interagency Working Group as specified above. As above, such values shall be updated for inflation.

(III) Any discount rate applied to calculate the present value of the total costs or benefits of future changes in emissions of greenhouse gases shall be the same as the discount rate used to calculate the underlying estimate of the social cost of greenhouse gases.

(IV) The Commission shall provide standardized values for the social cost of greenhouse gases over an analytical timeframe of appropriate length to balance the following criteria: the ability to estimate future quantities of emissions with reasonable accuracy; the ability to calculate the future social costs, or the annual growth rate for social costs, with reasonable accuracy; and the significance of the present value of future climate effects after application of an appropriate discount rate. At a minimum, the Commission shall provide values through year 2060 emissions, by applying a reasonable growth rate to the Interagency Working Group’s estimates of the social cost of year 2050 emissions.

(V) Minimum values for the social cost of carbon and social cost of methane are provided by the following tables, based on the Interagency Working Group’s estimates published in 2016, adjusted for inflation to year 2018\$ and converted from metric tons to short tons:

Table: Social Cost of Carbon Dioxide (per short ton, in 2018\$)

Year	Central (3%)	High-Impact (95th Pct)	Year	Central (3%)	High-Impact (95th Pct)
2020	\$47.29	\$138.50	2040	\$67.56	\$206.06
2021	\$47.29	\$141.88	2041	\$68.69	\$209.44
2022	\$48.42	\$145.25	2042	\$68.69	\$212.81
2023	\$49.54	\$148.63	2043	\$69.81	\$216.19
2024	\$50.67	\$152.01	2044	\$70.94	\$218.44
2025	\$51.80	\$155.39	2045	\$72.06	\$221.82
2026	\$52.92	\$158.77	2046	\$73.19	\$225.20
2027	\$54.05	\$161.02	2047	\$74.32	\$228.58
2028	\$55.17	\$164.40	2048	\$75.44	\$231.96
2029	\$55.17	\$167.77	2049	\$76.57	\$235.33
2030	\$56.30	\$171.15	2050	\$77.69	\$238.71
2031	\$57.43	\$174.53	2051	\$78.94	\$242.53
2032	\$58.55	\$177.91	2052	\$80.20	\$246.41
2033	\$59.68	\$181.29	2053	\$81.48	\$250.35
2034	\$60.80	\$184.66	2054	\$82.79	\$254.36
2035	\$61.93	\$189.17	2055	\$84.11	\$258.43
2036	\$63.06	\$192.55	2056	\$85.46	\$262.56
2037	\$64.18	\$195.92	2057	\$86.82	\$266.77
2038	\$65.31	\$199.30	2058	\$88.21	\$271.03
2039	\$66.43	\$202.68	2059	\$89.63	\$275.37
			2060	\$91.06	\$279.78

Table: Social Cost of Carbon Methane (per short ton, in 2018\$)

Year	Central (3%)	High-Impact (95th Pct)	Year	Central (3%)	High-Impact (95th Pct)
2020	\$1,351.20	\$3,603.20	2040	\$2,252.00	\$6,192.99
2021	\$1,351.20	\$3,715.80	2041	\$2,364.60	\$6,305.59
2022	\$1,463.80	\$3,828.40	2042	\$2,364.60	\$6,418.19
2023	\$1,463.80	\$3,941.00	2043	\$2,477.20	\$6,530.79
2024	\$1,576.40	\$4,053.60	2044	\$2,477.20	\$6,643.39
2025	\$1,576.40	\$4,166.20	2045	\$2,589.80	\$6,868.59
2026	\$1,576.40	\$4,278.80	2046	\$2,589.80	\$6,981.19
2027	\$1,689.00	\$4,391.40	2047	\$2,702.40	\$7,093.79
2028	\$1,689.00	\$4,504.00	2048	\$2,702.40	\$7,206.39
2029	\$1,801.60	\$4,616.60	2049	\$2,815.00	\$7,318.99
2030	\$1,801.60	\$4,729.20	2050	\$2,815.00	\$7,544.19
2031	\$1,801.60	\$4,841.80	2051	\$2,885.37	\$7,710.17
2032	\$1,914.20	\$5,067.00	2052	\$2,957.51	\$7,879.79
2033	\$1,914.20	\$5,179.60	2053	\$3,031.44	\$8,053.14
2034	\$2,026.80	\$5,292.20	2054	\$3,107.23	\$8,230.31
2035	\$2,026.80	\$5,517.40	2055	\$3,184.91	\$8,411.38
2036	\$2,139.40	\$5,630.00	2056	\$3,264.53	\$8,596.43
2037	\$2,139.40	\$5,742.60	2057	\$3,346.15	\$8,785.55
2038	\$2,252.00	\$5,855.19	2058	\$3,429.80	\$8,978.83
2039	\$2,252.00	\$6,080.39	2059	\$3,515.55	\$9,176.37
			2060	\$3,603.43	\$9,378.25

(b) No later than August 1 of each year, Commission staff shall compute the cost of ~~carbon dioxide~~ greenhouse gas emissions, starting with the minimum values in the tables in this rule, but adjusting them for inflation, applying reasonable growth rates to extend estimates beyond year 2060 emissions as appropriate, and making other substantive updates as consistent with the best available science and economics, ~~for each of the following 40 years~~ and shall present its calculations to the Commission. The Commission will open a proceeding and give notice of the cost of ~~carbon dioxide~~ greenhouse gas emissions calculated by the Commission staff. Any interested person may file comments regarding the cost of ~~carbon dioxide~~ greenhouse gas emissions in accordance with the Commission’s notice.

(c) No later than November 1 of each year, the Commission shall issue a written decision approving or modifying the cost of ~~carbon dioxide~~ greenhouse gas emissions as calculated by Commission staff. Regardless of whether the Commission has yet issued such a written decision, the minimum values provided in the tables in this rule shall apply.

Sincerely,

Jason A. Schwartz, Legal Director
Institute for Policy Integrity