Keystone XL Could Cost Society Over $100 Billion per Year

On April 22, more than one million comments opposing the Keystone XL pipeline were delivered to the State Department. The EPA weighed in too. In its review of the State Department draft Supplementary Environmental Impact Statement (SEIS), the EPA identified "significant environmental impacts" and noted that full assessment of these impacts was not possible due to insufficient information.

One of the missing pieces of information is an estimate of the damage – translated into dollars – that Keystone XL's climate pollution would do to health, property, agriculture, ecosystem services, and more.

That estimate, provided here, ranges to over $100 billion per year.

The Obama Administration has made clear that estimating this cost – the "social cost of carbon" – is a "critical step in formulating policy responses to climate change."

The Department of Defense points out that climate change "may have significant geopolitical impacts…contributing to greater competition for more limited and critical life-sustaining resources like food and water[…] [E]ffects of climate change…may act as accelerants of instability or conflict…[and] may lead to increased demands for … humanitarian assistance or disaster response."

The Department of Homeland Security states that "[i]ndirectly, climate change acts as a "threat multiplier," aggravating stressors abroad such as poverty, environmental degradation, and social tensions, resulting in conditions that could enable terrorist activity, violence, and mass migration." It also details the threat climate change poses to domestic ecosystems and infrastructure and the costs this may impose on the U.S. economy.[1]

In this new and changing climate context, attempts to monetize damages are crucial to help better inform decision-making.

In 2009, the Council of Economic Advisers and the Office of Management and Budget convened an interagency group, with regular input from the Council on Environmental Quality, National Economic Council, Office of Energy and Climate Change, and Office of Science and Technology Policy. The Environmental Protection Agency and the Departments of Agriculture, Commerce, Energy, Transportation, and Treasury were also active participants.

In 2010, this Interagency Working Group on the Social Cost of Carbon (IAWG) offered a provisional estimate

of the social cost of carbon (SCC) for carbon dioxide; i.e., they estimated the dollar value of some of the damage done to human society, per metric ton of CO_2, as that ton is added to the cumulative global sum of emissions.

The IAWG emphasized that its analysis has a "number of limitations" and that the estimates are "incomplete." To take just one example, Ocean Acidification, a "potentially large damage from CO_2 emissions" is not quantified in the analysis (let alone monetized).

Further, the IAWG used a limited set of discount rates and "provided a rationale for the upper end discount rates it selected, but did not do the same for *excluding* lower values."[2] High discount rates yield low estimates of the cost of damages.

According to Senator Sheldon Whitehouse [D-RI], the Administration is currently reassessing the low SCC estimates published in 2010 obtained from the unbalanced set of discount rates. By including the previously excluded lower discount rates, while otherwise applying the same IAWG methodology, the upper-range SCC estimate increases by an order of magnitude.[3] Therefore, while the methodology for calculating the social cost of CO_2 is still developing, the range of possible cost estimates is very wide, ranging from $5 to as much as $758 per ton. (See Endnote 3.)

Because the difference in lifecycle emissions between tar sands oil and average U.S. crude is "a major focus of the public debate," the EPA expects State to estimate the monetized damage based on this difference in emissions, i.e., based on "incremental" emissions relative to a business-as-usual average-U.S.-crudes scenario.

But business-as-usual, aka "current policies", has, in the words of the chief economist of the International Energy Agency, "catastrophic implications for all of us." Guaranteed climate catastrophe is clearly a disastrous basis for policy-making and we need to start measuring policies against scenarios that avoid disaster. This is one reason why estimating the social cost of the climate damage of the Keystone XL pipeline should not be based on the incremental emissions relative to a conventional fossil fuel scenario, but instead should be based on the pipeline's full climate pollution footprint.

As it turns out, this "full footprint" approach is the approach the International Monetary Fund took earlier this year when estimating the current global fossil fuel subsidy arising from the failure to put a price on climate pollution.[4]

As previous Oil Change International analysis has shown, the Keystone XL pipeline's total carbon footprint would be over 181 million tons of CO_2e per year.

Using the IAWG SCC estimates, Keystone XL's social cost of carbon would range from $1 billion to over $10 billion per year, in the pipeline's first year of operating.[5]

In emphasizing the importance of considering the full range of SCC estimates, the IAWG points out: "no consensus exists on the appropriate [discount] rate to use in an intergenerational context." However, this

point applies not only to the range of discount rates the IAWG *did* consider, but also to discount rates that they did *not* consider. Taking this fuller range into account, Keystone XL's SCC price tag could range from $1 billion to ***over $100 billion*** in the pipeline's first year of operations, and grow from there.[6]

If society has to subsidize Keystone XL to the tune of billions of dollars per year, maybe over $100 billion per year, how can it possibly be in the national interest?

So far, the State Department's assessment has failed entirely to consider the social cost of carbon. Until government agencies properly account for the cost of climate change caused by major fossil fuel infrastructure, projects like Keystone XL will continue to impose disproportionate costs on society. The failure to account for those costs is at the root of our failure to address global climate change and its consequences.

ENDNOTES

[1] "More intense storms, frequent heavy precipitation, heat waves, drought, extreme flooding, and higher sea levels could significantly change the types and magnitudes of hazards impacting communities and the emergency management professionals serving them […] The impacts of climate change could directly affect the Nation's critical infrastructure. In U.S. coastal regions, rising sea levels, higher storm surge, and increased erosion could damage or destroy critical infrastructure […] [H]igher temperatures and more frequent or severe heat waves could buckle railways, damage roads, and strain power systems […] Higher temperatures and more intense storms may cause damage or disruptions to telecommunications and power systems, creating challenges for telecommunications infrastructure, emergency communications, and cybersecurity […] [H]igher temperatures may change patterns of human, animal, and plant diseases […] In addition, severe weather events, mass migration issues, pandemics, and degraded [critical infrastructure and key resources] could stretch Federal resources, placing a greater burden on [State, Local, Tribal and Territorial] and private sector partners."

[2] Open Access pdf Here

[3] The IAWG selected four SCC estimates: "For 2010, these estimates are $5, $21, $35, and $65 [per ton of CO_2] (in 2007 dollars). The first three estimates are based on the average SCC across models and socio-economic and emissions scenarios at the 5, 3, and 2.5 percent discount rates, respectively. The fourth value is included to represent the higher-than-expected impacts from temperature change further out in the tails of the SCC distribution. For this purpose, we use the SCC value for the 95th percentile at a 3 percent discount rate. […] These SCC estimates also grow over time. For instance, the central value increases to $24 per ton of CO_2 in 2015 and $26 per ton of CO_2 in 2020." Johnson & Hope 2012 [open access pdf here] use the IAWG methodology but expand the range of discount rates considered to include 1, 1.5, and 2 percent discount rates, so that there are six estimates based on the respective averages across models and socio-economic scenarios. For 2010, the three additional estimates are $62, $122, and $266 per ton of CO_2 (in 2007 dollars). The question arises how to represent the risk of impacts from temperature change further out in the tails of the SCC distribution, for this fuller range. The IAWG used the SCC value for the 95th percentile at a 3 percent discount rate in its limited discount rate analysis. But that value is much smaller than two of the average values in the expanded analysis. The SCC value for the 95th percentile at the (new) mid-range discount rate can't play this role, either, because the new center is in between the 2 percent and 2.5 percent discount rates, and that 95th percentile is still too small as it turns out. If we instead choose the SCC value for the 95th percentile at a 1 percent discount rate, we get $758 as our seventh and highest value. So the full range would be $5 - $758. If we instead simply double the highest average value (based on $65 having been roughly 2 x $35) – we get 2 x $266, and the full range would be $5 - $532. Either way (whether we use $532 or $758), the upper range SCC value is roughly an order of magnitude larger than the upper range value obtained when only considering the limited range of discount rates considered by the IAWG in 2009-2010.

[4] The appropriateness of using the SCC for calculating the cost of emissions that are not small relative to the cumulative global carbon dioxide emissions is not clear. However, even the total global annual emissions are small relative to the cumulative global carbon dioxide emissions, which makes the IMF approach appropriate.

[5] The 2015 SCC (in 2007 dollars) price tag of the Keystone XL pipeline is estimated at 181 million x SCC (2015) x 0.95. The 0.95 factor assumes that, in the Keystone XL context, $CO_2 = 0.95CO_2e$; the draft SEIS notes that in this context "emissions in units of CO_2e are often nearly equal to the quantity of CO_2 emitted." The IAWG 2015 SCC ranges from $6 to $73 per ton CO_2, so the social cost of carbon dioxide of Keystone XL in its first year of operating would range from $1 billion to $13 billion.

[6] Using the expanded range in Endnote 3, the upper range value would be $91 billion or $130 billion, already in 2010 (in 2007 dollars), and higher still in 2015.