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Economy-Wide Costs Versus Cost to the Multi-Lateral Fund: A comparison of CEEW-IIASA and TEAP cost estimates

Vaibhav Chaturvedi, Lekha Sridhar

The Council on Energy, Environment and Water (CEEW) and International Institute for Applied Systems Analysis (IIASA) recently released a joint report on the economy wide mitigation potential and associated economy wide cost for India under the various amendment proposals. As per the CEEW-IIASA analysis, given the information currently available, the economy-wide cost for India between 2015 and 2050 will be close to 12 Billion Euros (sum of undiscounted costs, in 2015 prices) under the Indian amendment proposal and 34 Billion Euros under the North American (NA) amendment proposal. The recent report released by the Technology and Economic Assessment Panel (TEAP) in September 2016 also mentioned the cost under various proposals. The estimates of cost in the TEAP report are 3.44-5.25 Billion US$ for the North American proposal and 9.30-14.22 Billion US$ for the Indian proposal. The objective of this fact sheet is to explain the cost estimates from both the CEEW-IIASA analysis and the TEAP analysis so that the stakeholders can understand and compare these in the correct way.

What is meant by economy wide costs as per the CEEW-IIASA analysis?

The economy wide costs estimation approach adopted by CEEW-IIASA is grounded in the methodology used in climate-policy research. As per this approach, emission mitigation potential is estimated in reference to a 'business-as-usual (BAU)' scenario, and economy-wide mitigation costs are calculated corresponding to the economy-wide mitigation potential under each alternative policy scenario. Thus each policy scenario has a cost which is associated with the mitigation that has to be achieved under the given policy scenario. Higher the mitigation potential, higher will be the cost. The underlying critical pieces of information for the calculation of economy wide costs are the emissions/refrigerant consumption in the BAU scenario, the policy scenario characteristics which in a way specify the level at which emissions/refrigerant consumption have to be capped, and the cost of different low GWP alternatives across different sectors. This cost is hence only the 'incremental cost' due to policy. E.g. if 100 GWh electricity production based on coal power plants (to be constructed) has been planned under the BAU for the next 20 years, and this is to be replaced by equivalent electricity production based on solar power plants under the mitigation policy, it is only the additional cost (difference between cost of 100 GWh based on coal versus solar) that matters for estimating the cost of mitigation. CEEW-IIASA study also highlights the economy wide benefit that could be accrued through energy efficiency for some sectors, to the tune of 48-54 Billion Euros between 2015 and 2050. It is however important to mention the costs and benefits separately as these are borne by different sectors and the level of agreement on the underlying information on low GWP alternatives, their technical characteristics, and their cost is also different.

What is meant by costs as per the TEAP analysis?

The TEAP analysis focuses on the cost to the Multilateral Fund (MLF) under the Montreal Protocol. The MLF is a compensatory fund that pays for the 'loss of profits' and 'incremental cost' in developing countries or Article 5 (A5) parties. Thus the costs are for compensating for the loss of profits to HFC manufacturers and incremental cost of conversion borne by other companies in developing countries. TEAP collects information on the existing refrigerant manufacturing capacity, potential growth in this capacity, and components of incremental cost to estimate the cost to the MLF under different proposals.

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Why are the results from the two studies contradicting in nature?

Under the Indian proposals, developing countries get 10 years additional for a freeze as compared to the NA proposal. This means that additional capacity for manufacturing HFCs will be set up in these 10 years. The MLF will have to also compensate for the 'loss of profits' from this additional manufacturing capacity that would be avoided if the NA proposal is accepted. Hence the cost to MLF will increase for the Indian proposal relative to the NA proposal.

Under the economy wide cost analysis, the cost increases as the freeze date and baseline year are preponed. This is because there will be additional operational investments required when the freeze is preponed. E.g. if under the Indian proposal, the mobile air-conditioning (MAC) sector has to transition to low GWP alternatives after 2040, this transition has to occur by 2027/2028 under the NA proposal. Hence all the cars manufactured between the two time periods will have to be fitted with additional equipment and costlier refrigerant which will increase the overall economy wide cost. This will be true for other sectors also.

There is no contradiction in the two estimates, as these talk about very different things. In effect, the cost to MLF is the cost to be borne by developed countries (non A5 parties), while the economy wide cost is a burden to be borne by developed countries as well as developing countries.

Is it logical to compare both the numbers?

It is not logical to compare the estimates from the CEEW-IIASA and TEAP analysis as these two are conceptually different. One is economy wide costs, while the other is a compensatory fund. In a way, the estimates of CEEW-IIASA begin where the estimates of TEAP ends. MLF will provide compensation in the year in which the industry shifts to low GWP alternatives. The economy on the other hand bears the additional cost for all the future years from the freeze to 2050. For the Indian proposal, cost to MLF will be for supporting industries in A5 parties transitioning in or before 2031, but the cost to the economy will be from the beginning of the transition up to 2050.

Also, CEEW-IIASA estimates are for India only, while the TEAP estimates are for the A5 parties. For the economy-wide cost estimation, it doesn't matter who bears the cost within the economy as that it a separate question. This economy wide cost can be distributed in different ways between different producers and consumers within the country. Only a part of the economy wide cost is compensated by the MLF.

Should the Multilateral Fund compensate for the economy wide costs?

As of now, the MLF compensates for only 'loss of profits' or 'incremental cost'. Whether it should compensate for the economy wide costs is for the parties to decide. The total economic burden on Article 5 parties will be huge compared to the funding available with MLF, so it might be unrealistic to expect that MLF will be able to compensate for the economy wide costs borne mainly in some sectors. What is important to highlight is that the economy wide cost is for mitigating high GWP HFCs. Countries will ultimately have to bear a part of this cost in order to contribute to mitigating global warming. Also, there is significant potential for economic benefits through choosing energy efficient alternatives as well for countries to harness.

Why understand economy wide costs?

It is important to understand the economy wide cost for the following reasons:

- There is opportunity cost of money. The additional economic burden that a country bears could have been allocated to another priority sector for economic development.
- There is economy wide cost and mitigation potential for different sectors for a HFC phase down which could be compared with cost of other mitigation technologies like solar. This comparison can inform which is a more cost effective way for mitigating greenhouse gases.
- The uncompensated economic burden undertaken by a developing country needs to be highlighted at various international forums, that the country has agreed to bear this level of economic burden for mitigating the impacts of climate change.

Why analyse cost only till 2050?

Theoretically, any additional cost per equipment (e.g air-conditioners, cars, etc.) will be borne forever. But for the purpose of comparison of the amendment proposals, 2050 is a reasonable date as beyond this date the key big sectors would have already transitioned under any proposal. The difference will only be prior to 2050.

Could estimates of cost change in the future?

Any cost estimate for the future, be it CEEW-IIASA estimates or TEAP estimates, depend on the best information available currently. As new information emerges, the estimates can also be expected to change in the future.

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