Austin Environmental Sciences

Open Access

Austin Publishing Group

Editorial

A First Step in the Consumption-Based Accounting Direction

Caro D*
Department of Environmental Science, Aarhus University, Denmark

***Corresponding author:** Dario Caro, Department of Environmental Science, Aarhus University, Frederiksborgvej 399, DK-4000 Roskilde, Denmark

Received: June 13, 2016; **Accepted:** June 24, 2016; **Published:** June 26, 2016

Editorial

Global Warming is a dramatically urgent and serious problem and our planet needs a new development model of growth that is sustainable [1]. The Paris UN Climate Conference has represented an historic opportunity to put the world on course to meet the climate change challenge [2]. More than 200 countries supported a goal of keeping global temperature rises to 2C but agreed to keep it to 1.5C above pre-industrial levels. To achieve this important goal, a decisive mitigation of Green House Gas (GHG) emissions is urgently needed. The decision by national governments to take measures to mitigate GHG emissions calls for suitable tools for monitoring and quantifying emissions, as well as checking reduction.

At the present time, the monitoring of GHG emissions within a territorial system uses IPCC guidelines to realize annual inventories assessing the amount of GHG emissions [3]. The IPCC provides guidelines intended for use by individual countries in estimating the total GHG emissions generated by each productive activity coupled with 4 emissions sectors [3]. These GHG inventories are developed yearly, by following a standardized procedure for the computation of GHG emissions. Currently, the IPCC accounting represents the official reference point upon which environmental policies and strategies able to drive the GHG emission reduction at national scale can be based [4].

Although the IPCC-based accounting provides punctual measures of GHG emissions at the national level, some researchers have argued that it shows an incomplete picture of the emissions that can be attributed to the economy [5-7]. The IPCC-based accounting refers to the principle of geographical responsibility to allocate emissions: GHG emissions are in general assigned on the basis of the source localization. Consequently, it has been highlighted that the geographical approach implies a problem relative to the allocation of GHG emissions involved in international trade [8]. In short, this approach gives the responsibility of GHG emissions to producer countries irrespective of the goods are consumed in the same producer country or elsewhere, thus neglecting the international trade effect. For instance, if a mobile phone is produced in China and then exported in US, the IPCC accounting assigns all the emissions due to the production of the mobile phone to China, whereas zero emissions are assigned to US. Moreover, when national production is shifted to countries without emissions commitments, it may lead to an overall increase in global emissions referred to as "carbon leakage" effect [9].

The debate on how to monitor GHGs released from countries has become relevant in the recent years. Although the binding agreements in the all Kyoto and post-Kyoto commitments refer to the IPCC accounting, alternative GHG emission accountings have been presented in the scientific literature. In particular, different approaches in terms of allocation of the "responsibility" of GHG emissions have been extensively discussed in the last two decades [10-12]. In this context, models based on Environmental Extended Multi Regional Input-Output (MRIO) are cutting-edge [13], however their implementation as GHG monitoring tool referring to the international agreements is still not approved by international organizations. The discussion about the tool for estimating GHG emissions would seem just to be a technical issue. However, a large body of literature has highlighted that such choice determines the results of the GHG inventory and the related policy implications for each country. There is an urgent need to understand the strengths and the weakness of the traditional (IPCC-based) and alternative GHG emission accountings.

The consumption-based accountings are based on a different approach in which a country is responsible for emissions due to the consumption of goods and services. In this context, MRIO models include, in monetary terms, imports as process vectors responsible for GHG emissions, as well as the indirect emissions in the total supply chain, assigning these to each consumer country as they directly solicit the production of imported goods and services [14]. The use of MRIO analysis to the aim of attributing the responsibility for GHG emissions to the final consumers is constantly increasing. Given the current globalization trends of economic patterns, in which most of the products used for economic activities are actually produced in places different from those of consumption, the consumption-based accountings can be highly informative [15]. Although MRIO analysis represent a valid alternative, their implementation is still too difficult in terms of practical and political feasibility. While it is clear that there are several advantages to using a MRIO analysis [16], their implementation would require a drastic change with respect to the traditional accounting, thus destabilizing the present monitoring and environmental strategies currently associated with it. Additional concerns also arise from the lack of an appropriate uncertainty analysis [17].

Although the adoption of the MRIO analysis would have deep consequences on the current trading system, generating new trade flows in which the environmental impact of producer countries would be a key aspect to consider for importing countries [18], their implementation would imply a radical change in the current trading equilibrium and relative policies. In particular the utilization of MRIO

Citation: Caro D. A First Step in the Consumption-Based Accounting Direction. Austin Environ Sci. 2016; 1(1): 1004.

would replace the current accounting system [19], thus affecting the international regulations based on IPCC-based accounting which are presently adopted. In this context, less detailed but more feasible alternative consumption-based accountings, not replacing the current method to estimate national emissions have been presented in literature and they need more attention [20,21]. They could represent a simple way to move a first step in the consumption-based accounting direction without excessively altering the equilibrium created during the Kyoto and post-Kyoto period. They may be a necessary preliminary step toward soliciting countries to reduce the GHG emissions embodied in trade and to direct production towards cleaner technologies.

References

1. Stocker T, Dahe Q, Plattner GK, (Eds.) Stockholm; The Physical Science Basis. Contribution of Working Group I to the 5th Assessment Report of the IPCC. 2003.
2. Conferences of parties, Draft decision, Framework Convention on Climate Change, 2015.
3. Eggleston HS, Buendia L, Miwa K, Ngara T, Tanabe K (eds). Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventories Programme, Published: IGES, Japan. 2006.
4. Bastianoni S, Marchi M, Caro D, Casprini P, Pulselli FM. The connection between 2006 IPCC inventory methodology and ISO14064-1 certification standard. A reference point for the environmental policies at sub national scale. Environmental science and policy. 2014; 44: 97-107.
5. Sprigmann M. Integrating emissions transfers into policy-making. Nature Climate Change. 2014; 4: 177-181.
6. Peters GP, Hertwich EG. Post-Kyoto greenhouse gas inventories: production versus consumption. Climate Change. 2008; 86: 51-66.
7. Lenzen M, Murray J, Sack F, Wiedemann T. Shared producer and consumer responsibility: theory and practice. Ecological Economics. 2006; 61: 27-42.
8. Rodrigues J, Domingos T. Consumer and producer environmental responsibility: comparing two approaches. Ecological Economics. 2008; 66: 533-546.
9. Ghertner DA, Fripp M. Trading away damage: Quantifying environmental leakage through consumption-based, life-cycle analysis. Ecological Economics. 2007; 63: 563-577.
10. Gupta S, Bhandari PM. An effective allocation criterion for CO_2 emissions. Energy Policy. 1999; 27: 727-736.
11. Munksgaard J, Pedersen KA. CO_2 accounts for open economies: producer or consumer responsibility? Energy Policy. 2001; 29: 327-334.
12. Zaks DPM, Barford CC, Ramankutty N, Foley JA. Producer and consumer responsibility for greenhouse gas emissions from agricultural production: a perspective for the Brazilian Amazon. Environmental research letters. 2009.
13. Wiedmann T, Wilting HC, Lenzen M, Lutter S, Palm V. Quo Vadis MRIO? Methodological, data and institutional requirements for Multi-Region Input-Output analysis. Ecol Econ. 2011, 70: 1937-1945.
14. Lenzen M, Kanemoto K, Moran D, Geschke A. Mapping the structure of the world economy. Environmental Science and Technology. 2012, 46: 8374-8381.
15. Wiedmann T. A review of recent multi-region input−output models used for consumption-based emission and resource accounting. Ecological Economics. 2009, 69: 211−222.
16. Davis SJ, Peters GP, Caldeira K. The supply chain of CO_2 emissions. Proceedings of the National Academy of Sciences of the United States of America. 2011; 108: 18554-18559
17. Peters G, Hertwich EG. CO_2 embodied in international trade with implications for global climate policy. Environmental science & technology. 2008, 42: 1401-1407.
18. Davis S, Caldeira K. Consumption-based accounting of CO_2 emissions. Proceedings of the National Academy of Sciences of the United States of America. 2010; 12: 5687-5692.
19. Caro D, Rugani B, Benetto E, Pulselli FM. Implications of a consumer-based perspective for the estimation of GHG emissions. The illustrative case of Luxembourg. Science of the total environment. 2015; 508: 67-75.
20. Caro D, Bastianoni S, Borghesi S, Pulselli FM. On the feasibility of a consumer-based allocation method in national GHG inventories. Ecological Indicators. 2014; 36: 640-643.
21. Bastianoni S, Caro D, Borghesi S, Pulselli FM, The effect of a consumption-based accounting method in national GHG inventories: a trilateral application at macro and micro scale. Frontiers in Energy Systems and Policy. 2014; 2: 1-8.

Austin Environ Sci - Volume 1 Issue 1 - 2016
Submit your Manuscript | www.austinpublishinggroup.com

Citation: Caro D. A First Step in the Consumption-Based Accounting Direction. Austin Environ Sci. 2016; 1(1): 1004.