

## Research Articles

# Norm Conflict in Climate Governance: Greenhouse Gas Accounting and the Problem of Consumption

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In a May 2010 essay in *Global Environmental Politics*, Peter Dauvergne called for scholarship on “governing consumption globally” and pointed to the practical need for “policy processes to tackle head on the systemic drivers of consumption.”<sup>1</sup> Dauvergne’s call is apt in the context of climate change, especially in the way that states account for greenhouse gas (GHG) emissions. GHG accounting rules, although technical, have significant implications for international climate negotiations, domestic mitigation policies, and global consumption patterns. We highlight the importance of this issue by examining the political consequences of the climate regime’s adoption of “territorial” or “production-based” accounting—that is, accounting that measures GHG emissions arising from production rather than allocating emissions on the basis of consumption. Research demonstrating the economic inefficiency of production-based mitigation measures has led many economists to recognize the advantages of an integrated assessment based on embodied GHG emissions (i.e., total emissions that arise as a consequence of creating and bringing a product to consumers).<sup>2</sup> However, the political implications of emissions accounting methodologies have received less attention. Among the most significant implications is the tendency for production-based accounting to divert political attention away from consumption as a driver of emissions growth.

In this article we first discuss the global distribution of GHG emissions from production and consumption. We summarize economic literature assessing inefficiencies that arise when states treat emissions from local production

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1. Dauvergne 2010, 1–7.

2. Peters and Hertwich 2008a, 2008b; Pan et al. 2009; Steckel et al. 2010.

differently from emissions embedded in imports. Domestic mitigation policies that limit national production emissions without reference to trade in embodied emissions may *increase* global emissions if they promote expansion of production in less energy-efficient locations.<sup>3</sup> We then examine how accounting methodologies influence the international politics of climate change. Production-based emissions accounting contributes to conflicts among the norms of statism, “common but differentiated responsibility” (CBDR), and “liberal environmentalism” (use of market mechanisms to pursue environmental goals). We explain why these tensions might be partially resolved if national mitigation efforts were differentiated on the basis of consumption rather than production.

### Greenhouse Gas Accounting Rules: The Significance of Consumption-Based Accounting

Accounting rules influence the way that climate change mitigation is conceptualized. A switch to consumption-based accounting and targets would potentially allow “differentiated responsibility” to be implemented through policies targeting high-consumption lifestyles everywhere. At the level of individual behavior, consumers who wish to minimize climate impacts require ready access to information about emissions embodied in products. If national consumption-based emissions targets were adopted, policymakers would probably create price signals or point-of-sale labeling schemes to supply this information. Consumption accounting might also change perceptions in ways that could promote international cooperation on border measures, transport emissions, and technology transfer.

Fundamental political obstacles confound adoption of an effective and economically efficient global response to climate change because there is a mismatch between the affluent (mostly European) states that are most enthusiastic about responding to climate change and the locations where abatement efforts can be most productive.<sup>4</sup> Evidence suggests that the developing world is home to over two-thirds of the lowest-cost abatement opportunities,<sup>5</sup> and will account for 97 percent of anticipated growth in energy-related carbon dioxide (CO<sub>2</sub>) emissions before 2030.<sup>6</sup> Moreover, constraining emissions enough to limit global warming to 2° C above the pre-industrial average would require annual investment of US\$140–175 billion in the developing world between 2010 and 2030.<sup>7</sup> However, mechanisms that allow markets to allocate resources to lowest-cost abatement opportunities, such as global trading of GHG emission entitlements, face political opposition and have implications for national sovereignty. It is, therefore, important to identify governance mechanisms that are

3. Babiker 2005.

4. Victor 2011, 61–82.

5. Edmonds et al. 2008; Hope 2009.

6. IEA 2008, 46.

7. World Bank 2010, 257.

both politically acceptable and effective in directing resources toward developing world emissions abatement. If developed countries were to acknowledge responsibility for their consumption emissions, investment in developing world abatement might gain political acceptance as a natural component of national policy.

Even within states that are supporters of aggressive climate policy, politicians often select policies that sound ambitious but which minimize present-day impacts on voters.<sup>8</sup> This dynamic results in stringent long-term targets and weak near-term actions, and, arguably, support for production-based targets. Production-based accounting has allowed many European states to meet emissions targets while allowing consumption-linked emissions to grow through imported embodied emissions. This situation suits the short-term interests of both Western political leaders and developing world producers, as it avoids targeting consumption. However, it undermines momentum toward the deep reforms that will be necessary to address climate change. If a “norm entrepreneur” state were to adopt a consumption-based emissions inventory and associated targets, other states that seek to be climate policy leaders might do so, and, in turn, might advocate incorporation of consumption-based approaches into international agreements. However, there are no obvious state champions of a shift to consumption-based accounting. Moreover, at a time when few developing states compile regular production-based inventories, building the state capacity to produce more complex consumption-based inventories would be difficult. Nevertheless, sufficient trade and emissions data is available for governments (or nongovernmental organizations) to compile, publish, and publicize *estimated* consumption inventories on a regular basis, and to adopt voluntary consumption-based emissions targets alongside existing production-based targets. By outlining some of the political implications of inventory accounting rules, the following sections seek to build on the work of those who are already agitating for wider attention to this topic among scholars, activists, and policy-makers.<sup>9</sup>

## Production Responsibility versus Consumption Responsibility

South American soybeans consumed in the US, Chinese-made cars exported to the European Union (EU), and Australian aluminum sold to Japan are examples of traded products that generate significant emissions in their production and transportation. In each case, national GHG inventories only record emissions associated with production. If China imports more factory-farmed beef, there is no change to China’s reported emissions. Likewise, if France imports automobiles, its emissions inventory does not change. Instead, emissions are recorded in the manufacturer’s national inventory. If the manufacturer is a devel-

8. Helm 2010, 192.

9. See Clarke 2010b; Hertwich and Peters 2009.

oping country with no mandatory emissions limits, there may be little effort to minimize emissions from the vehicles' production or shipment. For example, production in China or India is generally more emissions intensive than in France. Consequently, if French consumers purchase Chinese cars instead of locally produced vehicles, France's national emissions will drop even while global emissions increase.

The Intergovernmental Panel on Climate Change (IPCC) developed GHG accounting rules and reporting obligations over two decades of international negotiations and work. Adoption of these rules is one achievement of the United Nations Framework Convention on Climate Change (UNFCCC). Under Articles 4 and 12 of the UNFCCC, Annex I (developed-state) parties must submit national GHG inventories of anthropogenic emissions by sources and removals by sinks.<sup>10</sup> The IPCC's "Guidelines for National Greenhouse Gas Inventories" provide states with methodologies for compiling these inventories.<sup>11</sup> While developed states produce detailed annual emissions inventories, requirements for developing states are less strict. Most have provided only one or two national inventory reports, typically containing only two tables of aggregate data (as against the 43 tables required in developed states' reports).<sup>12</sup> A key feature of these accounting rules is that they adopt producer responsibility.<sup>13</sup>

The differences between production and consumption accounting relate to the treatment of GHG emissions embodied in imports, exports, and international transportation. A production inventory measures GHG emissions directly produced by activities within a particular state (emissions arising from transport of goods internationally are currently excluded from national reporting). Conversely, a consumption-based inventory would deduct emissions embodied in exports from a state's production total, and add emissions embodied in imports. Complexities arise in consumption accounting because many products have components from several states. For example, while production accounting allocates emissions associated with production of an automobile among the inventories of each state where components are manufactured, consumption accounting would allocate all emissions to the state which imports a car. Consumption accounting is consequently a complex process that may be confounded by inadequate reporting, since emissions data must be compiled from each stage of the supply chain.

Governments have long been aware of complex issues surrounding inventory accounting. Prior to adoption of the Kyoto Protocol, some states sought to adjust national emissions inventories to reflect trade in electricity and other products, and to adjust emissions baselines to reflect seasonal variations in energy use and trade. Denmark, for example, argued that adjustments should be

10. UNFCCC 2004.

11. IPCC 2006.

12. The Cancun Agreements partially rectify this by requiring more detailed reporting by developing countries. Breidenich 2011, 9–12.

13. Lenzen et al. 2007.

possible to account for seasonal fluctuations in hydroelectric power generation.<sup>14</sup> China, despite being a major exporter of embodied emissions, has shown little interest in consumption accounting.<sup>15</sup> Instead, its early interest in inventory reform centered on a 1991 push for per capita (rather than aggregate national) reporting.<sup>16</sup> At no point have states made any sustained attempt to assess national emissions associated with consumption, or to find a formula for dividing responsibility for emissions linked to traded goods (other than electricity).

States' common preference for production-based accounting is not surprising. Production or "territorial" accounting was adopted at a time when international trade in embodied emissions was less significant than it is today, and production accounting carried advantages: it is simpler than consumption accounting, allows for differential reporting processes among different states, and is consistent with existing methods for compiling energy statistics.<sup>17</sup> However, as international trade in embodied emissions has expanded, the gap between emissions assigned to developed states under production accounting versus those under consumption accounting account has grown. This has benefitted developed states' reputations while providing marginal assistance to developing world export industries.

While production inventories focus policymakers' attention on production emissions, consumption accounting highlights patterns of consumption. For example, disparities between per capita GHG emissions in developed and developing countries increase if considered in terms of consumption rather than production.<sup>18</sup> According to one study that analyzed 57 sectors in 113 countries, internationally traded production emissions grew from 4.3 gigatons (Gt) CO<sub>2</sub> to 7.8 Gt CO<sub>2</sub> between 1990 and 2008 (from 20 percent to 26 percent of global emissions), while emissions transfers from developing to developed countries through trade (which amounted to 1.6 Gt CO<sub>2</sub> in 2008) exceeded the Kyoto Protocol's emissions reductions.<sup>19</sup> Another study found that 23 percent of total CO<sub>2</sub> emissions were traded internationally in 2004, primarily as exports from emerging markets to the west.<sup>20</sup> This contradicts some perceptions about Europe's success in reducing GHG emissions. For example, in 2001 emissions embodied in imports were approximately 40 percent of domestic production-linked emissions in several EU states (France, UK, Germany, and Italy).<sup>21</sup> Whereas most developed states were net importers of emissions embodied in

14. UNFCCC 1996a, 5.

15. Pan et al. 2009, 143, n. 2; "Fighting Against Global Warming," *Xinhua*, 4 June 2007.

16. Carpenter et al. 1995.

17. Lenzen et al. 2007, 27–28; UNFCCC 1996b, para 16–18.

18. Ahmad and Wyckoff 2003; Wiedmann et al. 2007; Peters and Hertwich 2008c; Hertwich and Peters 2009; Peters et al. 2009; Wiedmann 2009.

19. Peters et al. 2011, 8533.

20. Davis and Caldeira 2010, 5687.

21. Peters and Hertwich 2008a, 41.

trade, developing countries together were net exporters. Thus, their inventories include emissions from products they have not consumed.

The disparity between consumption and accounting reporting is growing.<sup>22</sup> This is illustrated in several UK-specific studies showing an increase in total consumption-associated emissions from 1992 to 2004,<sup>23</sup> even as the UK's production inventory declined modestly.<sup>24</sup> Another study showed that trade between the UK and China reduced the former's CO<sub>2</sub> emissions by approximately 11 percent in 2004.<sup>25</sup> Moreover, because Chinese industry is less carbon-efficient, expansion of Chinese production does more than shift emissions from the UK to China. It *increases* total emissions arising from the same consumption. For example, the UK's imports of Chinese goods in 2004 resulted in a net global increase in emissions of 117 million tons of CO<sub>2</sub> (0.4 percent of global emissions) as against a scenario where this production had occurred domestically.<sup>26</sup> Other studies confirm that about half of China's emissions growth derives from export production,<sup>27</sup> and that EU consumption emissions of CO<sub>2</sub> grew approximately 47 percent between 1990 and 2006.<sup>28</sup> Such inequalities in consumption emissions are mirrored within countries. Inequalities in emissions among people within developing countries sometimes exceed the north-south inequalities witnessed on a global scale.<sup>29</sup>

## Effects of Production-Based Accounting on Mitigation Efforts

Inventory accounting rules matter. Governments are likely to adopt emissions targets based on the rules being followed (e.g., production-based targets under the Kyoto Protocol). Policymaking focused on minimizing domestic *production-linked* GHG emissions rather than *total* GHG emissions undermines effective mitigation efforts in at least three ways. Domestically, it can result in unbalanced mitigation policies that target production technique without addressing the scale and composition of consumption. Internationally, it encourages emissions "off-shoring" as production expands in developing economies that are subject to more limited emissions controls. Finally it undermines the pursuit of environmental efficiencies and environmental comparative advantage.

### *Unbalanced Mitigation Policies*

Production accounting rules and emissions targets encourage states to reduce their reported GHG emissions associated with domestic *production*. This is a fun-

22. Peters et al. 2009.

23. Baiocchi and Minx 2010; Wiedmann et al. 2010.

24. Choudrie et al. 2008, 12.

25. Li and Hewitt 2008, 1912.

26. Li and Hewitt 2008, 1912.

27. Guan et al. 2009; Pan et al. 2009.

28. Brinkley and Less 2010.

29. Ananthapadmanabhan et al. 2007.

damental problem with production-based accounting: it results in unbalanced attention to *production technique* over scale and composition. Advocates of sustainable consumption argue that sustainability requires reform of growth-dependent economic models because improvements in production technique invariably lead to increased net consumption if they are not accompanied by emissions limits.<sup>30</sup> If production creates pollution, this can be addressed by altering (a) the *scale* of production, which suggests reducing consumption (e.g., limiting aviation); (b) the *composition* of activity through substitution of one activity with another (e.g., consuming less emissions-intensive food);<sup>31</sup> (c) the *technique* of economic activity to reduce or eliminate harmful pollution (e.g., livestock waste management that captures methane); or (d) by eliminating a product through regulation or replacement (e.g., banning chlorofluorocarbons).<sup>32</sup>

Unilateral national mitigation policies will likely produce some shifts in scale, composition, and technique. These may be effective within non-trade-exposed sectors. For example, carbon pricing to increase the cost of domestic road transport might lead to changes in the scale, mode, and techniques utilized in transport in order to lower carbon emissions. However, if equivalent carbon pricing is not imposed on aviation, such a reform might encourage substitution of higher-emissions domestic aviation for lower-emissions domestic road-transport. As disparities between local and international emissions pricing increase, so will the perverse outcomes.

Some small trade-dependent economies illustrate problems inherent in production accounting. For example, because Singapore and Hong Kong (a semi-autonomous region within China) have little domestic manufacturing or agricultural production, their consumption emissions are several times higher than production emissions.<sup>33</sup> In both cases, energy generation is the largest category of reported emissions, and climate policies therefore focus on energy supply and efficiency.<sup>34</sup> However, policy makers in these economies have not addressed the more complex challenge of reducing consumption-linked emissions (e.g., through consumption-linked emissions taxes).

### *Carbon Leakage, Emissions Off-Shoring, and Environmental Comparative Advantage*

Very little “carbon leakage”—the relocation of specific businesses and productive capacity to avoid climate policies—has occurred to date.<sup>35</sup> However, a process of “emissions off-shoring” is occurring, with emissions embedded in goods exported from the developing world to the developed world increasing.<sup>36</sup>

30. Jackson 2009.

31. Weber and Mathews 2008.

32. Grossman and Krueger 1991; Brock and Taylor 2004.

33. Davis and Caldeira 2010, 5691; Peters and Hertwich 2008b; Hertwich and Peters 2009, 6416.

34. National Environment Agency 2010; Environment Bureau 2010.

35. See Peters and Hertwich 2008b.

36. Eckersley 2011, 371.



Studies of China's trade patterns cited earlier provide evidence that the relative scale of developing world production is increasing, resulting in an increase in aggregate emissions.<sup>37</sup> Developed world GHG pricing is not currently a significant driver of these trends. However, future intensification of emissions-control efforts may increase incentives that promote off-shoring. The problem warrants attention because developed states that support emissions controls could potentially use their imports of embodied emissions as a source of leverage to encourage mitigation in developing countries.

Emissions off-shoring illustrates a broader concern: efficient mitigation policies should direct investment toward locations where abatement costs are lowest. As we have seen, national production-based mitigation policies are potentially inefficient in any sector where production is organized internationally, or where locally produced items compete with traded items. Imagine country A, which has a strong domestic aquaculture industry but no domestic beef industry. A's consumers have no strong preference between consumption of imported factory-farmed beef (highest emissions) and local fish (lower emissions). However, if national climate policies raise the cost of fish, consumption might switch to relatively cheaper imported beef. This perverse outcome results because emissions pricing, applying only to domestic production, gives imports a competitive advantage. Market distortions will be greatest in the most emissions-intensive sectors. In a global economy, national production-linked emissions limits will frequently be environmentally sub-optimal.<sup>38</sup>

If environmental impacts are internalized in the cost of production, market mechanisms should theoretically shift production to locations where emissions intensity is lowest. The idea of "environmental comparative advantage" has been used to describe this effect. This idea suggests that states should specialize in producing goods for which their opportunity cost is lowest (i.e., where their comparative efficiency is greatest). Economic analysis of comparative advantage has traditionally focused on factors such as labor costs and resource availability, but the same dynamic could reward environmental competitiveness. Peters and Hertwich illustrate this through a discussion of aluminum.<sup>39</sup> Because aluminum production is exceptionally energy intensive, it is environmentally preferable for production to expand in locations with abundant renewable energy (usually hydropower). If GHG emissions pricing differs significantly between countries, economic incentives may instead promote productions in locations where emissions are unregulated. Energy costs are a major determinant of total production costs in only a limited number of industries, notably aluminum, iron, steel, cement, bulk glass, and paper, so the implications of this argument are currently limited.<sup>40</sup> However, if energy prices were to

37. Pan et al. 2009; Li and Hewitt 2008.

38. Gros 2009. Only minor distortions have arisen to date. See Aldy and Pizer 2009; Clarke 2010a, 158–159.

39. Peters and Hertwich 2008b, 58–59.

40. Houser et al. 2008; Aldy and Pizer 2009.



internalize the full externalities associated with GHG emissions, environmental comparative advantage would become more significant.

## Norm Hierarchy and the Climate Regime

To date, the UNFCCC has failed to halt, let alone reverse, the upward trajectory of global GHG emissions.<sup>41</sup> This failure might lead us to question whether the convention's rules and norms are well suited to the achievement of its goals. In this section we consider how accounting methodologies influence international climate negotiations. We map normative tensions in the climate regime with reference to Mlada Bukovansky's methodology for analyzing contradictions within a political culture (i.e., the rules and norms defining appropriate behavior). Bukovansky proposes that analysis of "international political culture" requires study of "the relationships of either contradiction or complementarity between its various elements" to identify the political actors that mobilize "around the contradictions and complementarities of the cultural system in pursuit of their strategic interests."<sup>42</sup> We identify three key "contradictions" in the climate regime's rules and norms that have been exploited by political actors: (1) between statism and neo-liberal market-based environmental policy; (2) between the general norm of reciprocity and its specific expression in the climate regime as a norm of common but differentiated responsibility; and (3) between emissions-reduction targets and national economic development (see Table 1). These tensions are not absolute conflicts. For example, economic development may be necessary for developing states to achieve emissions abatement. However, states exploit ambiguities and contradictions among the regime's norms by promoting particular interpretations of norms that accord with their perceived national interests. Resulting disputes impede a more effective international response to climate change. Although production-based inventory accounting rules were adopted for pragmatic reasons, this choice has had lasting consequences. Once adopted, international rules can create path dependence and may be preserved because of the difficulty of coalescing support around an alternative. Moreover, because rational actors do not continuously recalculate the advantages of all possible courses of action, states will often follow rules associated with international regimes simply because they constrain others and promote cooperation and predictability.<sup>43</sup> It is perhaps illustrative of this dynamic that after production accounting was adopted, UNFCCC negotiations selected production-based national targets with minimal consideration of consumption-based alternatives.

The resulting emphasis on production-linked emissions is consistent with a particular configuration of underlying norms that emphasizes state autonomy and competitiveness at the expense of ambitious mitigation commitments and

41. Le Quéré et al. 2009.

42. Bukovansky 2002, 12.

43. Keohane 1984, 115.

**Table 1**

Tensions among Norms in the UNFCCC

| <i>General Norms</i>          | <i>Regime-Specific Norms</i>                                    | <i>Tensions</i>   |
|-------------------------------|---|---|
| Statism (and CBDR)            | Neoliberal environmentalism                                     | The Kyoto protocol's flexibility mechanisms create opportunities for global application of market solutions. However, national production-based emissions targets remain the dominant emissions-control measures; differentiated national production targets are inconsistent with neoliberal environmentalism. |
| Reciprocity                   | Common but differentiated responsibility                        | Most developing states are supporters of a strict interpretation of CBDR. Developed states typically support a greater level of reciprocity in climate-mitigation policies.   |
| Right to economic development | Emissions reduction (an aspirational norm and treaty objective) | The norm of economic development has been prioritized over emissions-reduction targets with sufficient ambition to avoid dangerous climate change.  |

the "liberal environmental" goal of utilizing market mechanisms to achieve lowest-cost emissions abatement. Such tensions predate adoption of production-based accounting rules.<sup>44</sup> However, these rules impede their resolution. For example, production-based targets promote conflict over the interpretation of common but differentiated responsibility (CBDR). If developed states were to adopt consumption-based emissions targets, the competitiveness implications of differentiated national targets would be reduced, and the case for negotiating mechanisms to tax emissions embodied in developed world consumption (e.g., via equalizing border adjustments) would be strengthened. This alternative approach to implementing "differentiated responsibility" might facilitate more cooperative outcomes in climate negotiations.

Constructivist accounts suggest that regime norms most likely to succeed are those most consistent with international society's deeper norms.<sup>45</sup> Steven Bernstein's description of three levels of international culture, in which deeper-level norms condition the evolution of specific regimes, is instructive. In Bernstein's account, the deepest and most immutable norms define the identity of the units constituting the international system. In contemporary international

44. Meckling 2011.

45. Bernstein 2001; Kowert and Legro 1996; Reus-Smit 1999; Florini 1996.

society, the constitutive units are states.<sup>46</sup> While statism is fundamental to the international system, controversy surrounds the balance between state autonomy and reciprocal cooperation in any international regime. The next level of norms specifies the obligations and criteria of membership in international society and defines the nature of sovereignty in a given era (e.g., sovereign equality of states). Bernstein argues that a norm of “general and diffuse reciprocity,” requiring that all states are “treated essentially alike” and “enjoy the same rights and responsibilities,” is the most important norm at this level.<sup>47</sup> At a third level, norms adopted within specific regimes “constitute and regulate social relations differentiated functionally.”<sup>48</sup> Norms and rules specific to the climate regime, such as CBDR and liberal environmentalism, sit at this level.<sup>49</sup> The tensions between these norms correspond to tensions in climate negotiations.

#### *Common but Differentiated Responsibility, Reciprocity, and the Right to Development*

Common but differentiated responsibility is a particular expression of deeper-level norms of statism and reciprocity that recognize a general national “right to development” while also promoting action addressing climate change.<sup>50</sup> This nascent norm is described in the UNFCCC:

[C]limate change calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response, in accordance with their common but differentiated responsibilities and respective capabilities and their social and economic conditions. . . . Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof (UNFCCC, Articles 1 and 3).

While developing countries received “more favorable” treatment in some earlier international agreements, the UNFCCC goes further and adopts CBDR as a central principle.<sup>51</sup> Because CBDR is deliberately asymmetrical and requires developed states to act first, this norm violates the concept of equal treatment that is part of the norm of ‘reciprocity.’ Moreover, it threatens to alter the relative competitiveness of developed and developing states.

The Kyoto protocol operationalized CBDR by establishing binding emissions targets and stringent annual emissions reporting for developed states while setting no mandatory targets for developing states. Because the vast majority of future emissions growth will occur in the developing world, this agreement left the climate regime’s most intractable dilemma unresolved: a climate agreement that fails to constrain emissions growth in large developing economies cannot be effective. While the modesty of the Kyoto targets made this ini-

46. Bernstein 2001, 187.

47. Bernstein 2001, 187.

48. Bernstein 2001, 187.

49. Bernstein 2001; Florini 1996.

50. Shue 1995.

51. Stone 2004, 278–279.

tial expression of CBDR acceptable to many developed states, it opened a fault line in the climate negotiations between the US and developing countries, particularly China. The underlying tension arises because neither the US nor Chinese government is willing to accept unfair obligations, and each has very different ideas about what constitutes a level playing field. While these opposing conceptions of fairness connect to national discourses, their resolution is not assisted by the CBDR norm's ambiguity.

At the December 2009 Copenhagen summit, Chinese Premier Wen Jiabao illustrated the gap between American and Chinese conceptions of just differentiation when outlining his government's interpretation of CBDR:

The principle of "common but differentiated responsibilities" represents the core and bedrock of international cooperation on climate change, and it must never be compromised. . . . Developed countries must take the lead in making deep quantified emission cuts and provide financial and technological support to developing countries. This is an unshirkable moral responsibility as well as a legal obligation that they must fulfill.<sup>52</sup>

Contrast this with former President George W. Bush's rejection of CBDR when announcing the withdrawal of the US's signature from the Kyoto Protocol:

I oppose the Kyoto Protocol because it exempts 80 percent of the world, including major population centers such as China and India from compliance, and would cause serious harm to the US economy. The Senate's vote [rejecting any agreement that did not limit developing country emissions], 95–0, shows that there is a clear consensus that the Kyoto Protocol is an unfair and ineffective means of addressing global climate change concerns.<sup>53</sup>

Although the Obama Administration has been more open to US leadership in climate negotiations, it has also promoted weak interpretations of CBDR by insisting that developing states accept emissions limits. This dispute remained a central factor at the Copenhagen summit.<sup>54</sup> Given that China and the US together account for about 45 percent of global GHG emissions, this continuing deadlock is significant.<sup>55</sup> Production-based accounting and targets reinforce the deadlock by emphasizing China's high emissions from *production* over its relatively low consumption emissions, and by making it less attractive for US policymakers to influence production emissions in both countries through measures that target emissions from American consumption. In short, if "differentiation" were implemented on a consumption basis, its implications for competitiveness would be reduced.

52. Wen 2009.

53. Bush 2001.

54. Christoff 2009, 643.

55. Netherlands Environmental Assessment Agency 2008.

*Liberal Environmentalism and Statism*

The CBDR norm and the practice of production-based GHG accounting should be considered alongside another climate regime norm that won partial acceptance during Kyoto Protocol negotiations: liberal environmentalism.<sup>56</sup> As Bernstein explains,

[L]iberal environmentalism accepts the liberalization of trade and finance as consistent with, and even necessary for, international environmental protection. It also promotes market and other economic mechanisms (such as tradable pollution permit schemes or the privatization of commons) over “command-and-control” methods (standards, bans, quotas and so on) as the preferred method of environmental management.<sup>57</sup>

The animating idea of liberal environmentalism is that, with appropriate regulation to internalize environmental externalities, markets can be utilized to allocate resources and achieve environmental goals with optimal efficiency. While the Kyoto Protocol’s flexibility mechanisms partially operationalize this norm, the globalizing tendency implicit within liberal environmentalism conflicts with statism and the Kyoto Protocol’s expression of CBDR. This is because tackling climate change with optimal economic efficiency requires that a globally consistent price be placed on the relevant environmental externality, namely GHG emissions.

Marginal abatement costs are generally lower in developing countries. Consequently, economically optimal climate policies must find mechanisms to channel developed-world finance toward developing-world mitigation projects.<sup>58</sup> To illustrate this dynamic, imagine that it costs \$1 billion to close one US coal-fired power station and replace it with a renewable-energy power source. Now suppose that 20 new coal-fired stations are about to be constructed in China, and the same investment of \$1 billion could see all of them fitted with technologies that would halve their emissions. In this scenario, expenditure on small alterations to new developing-world infrastructure would achieve emissions cuts ten times more efficiently than would replacement of existing infrastructure in the developed world.<sup>59</sup> While US citizens might be reluctant to finance Chinese infrastructure, such possibilities are the kinds of efficiencies that market mechanisms are supposed to identify. It is this logic that provides the economic justification for the use of the Kyoto Protocol’s “flexible mechanisms,” notably emissions trading, joint implementation and the Clean Development Mechanism. Each allows states to meet their GHG targets through international measures. However, existing flexibility mechanisms capture only a small fraction of potential efficiencies.<sup>60</sup> Adoption of enforceable emissions tar-

56. Meckling 2011.

57. Bernstein 2001, 7.

58. Edmonds et al. 2008; Hope 2009.

59. But the “savings” in China are against projected future emissions growth.

60. See Victor 2011, 91–96.

gets in developed states, but not in developing ones, encourages differential pricing of emissions in different places. This application of the CBDR norm thus conflicts with liberal environmentalism, which pushes for globally consistent emissions pricing and global market mechanisms to direct investment toward lowest-cost abatement opportunities.

Differentiated production-based emissions targets layer more contradictions onto these tensions because they are inconsistent with the normative justification for CBDR and the liberal-environmental goal of economically efficient emissions abatement. The justification for the CBDR norm rests in the right of developing states to continued economic development to improve living standards and to accumulate sufficient resources for improving environmental conditions. However, national emissions targets that result from production accounting are not necessarily tailored to promote human development or environmental protection because benefits to developing countries may be captured by elites. There are strong normative arguments for pricing “survival emissions” associated with consumption by the world’s poor differently than “luxury emissions” associated with the lifestyles of affluent people, including those in developing countries.<sup>61</sup> However, there is no equivalent justification for exempting emissions from consumption of luxury goods simply because they were produced in the developing world. The increasing production of goods in the developing world for consumption in the West, and the growing numbers of affluent developing-world citizens living consumerist lifestyles, is rendering these inconsistencies increasingly obvious.

## Implications for Climate Change Policy

Adoption of *consumption*-based GHG accounting might generate fresh perspectives and minimize tension between CBDR and liberal environmentalism in climate negotiations, most obviously because consumption targets offer an alternative way to operationalize CBDR. By shifting attention to patterns of consumption, consumption-based accounting could reduce the political importance of developing-world GHG targets, shift attention away from national economic competition, and potentially facilitate “sectoral” agreements that target “luxury consumption” in developed *and* developing states. Consumption accounting may also promote progress toward addressing specific regulatory problems, such as taxation of emissions embodied in trade, regulation of bunker-fuel emissions, and promotion of technological diffusion.

### *Border Measures Targeting Emissions Embodied in Trade*

Opponents of climate action have focused on the implications of climate policy for national competitiveness. For example, proposed climate legislation in the

61. Baer et al. 2009; Chakravarty et al. 2009.

US (notably the failed Waxman-Markey American Clean Energy and Security Act) has included measures that would, if enacted, amount to a GHG border tax on imports from countries that have not imposed a price on carbon.<sup>62</sup> Although the European Commission has resisted these pressures, some EU states have advocated similar border tariffs.<sup>63</sup> Implementing such measures would be highly provocative because they would appear to be protectionist, potentially violating World Trade Organization (WTO) rules, and they are inconsistent with developing states' interpretations of CBDR.

Debates over border measures are far from resolved. While such measures may well serve protectionist purposes, there is no inherent reason why they could not be implemented under a multilateral, rule-based arrangement that is supportive of continued trade liberalization. Existing WTO rules allowing border tax adjustments to neutralize the impact of "value-added taxes" offer an example of how this might be achieved.<sup>64</sup> Such measures could be imposed on either exports or imports. Use of *export* tariffs to equalize emissions pricing could achieve the same environmental goals as carbon import tariffs, while allowing revenue to be retained within developing countries. Indeed, between 2006 and 2008 China imposed export taxes on energy-intensive products such as iron, steel, cement, and aluminum, imposing an implicit emissions price similar to the EU's allowance price.<sup>65</sup> This demonstrates that embodied emissions can be targeted in ways that are consistent with CBDR. Alternatively, national adoption of GHG consumption taxes that apply equally to local and imported goods could avoid much of the trade distortion associated with production taxes, although pricing emissions embodied in exports from mitigating to non-mitigating countries would then be problematic.<sup>66</sup> A shift to consumption-based inventories and targets would not automatically achieve a cooperative outcome. However, consumption-based national targets might spur negotiations by making the value of an international agreement on border measures more apparent.

### *International Transport Emissions*

GHG emissions from international aviation and shipping are not currently constrained by any global agreement and are not allocated to national inventories. This situation arose due to uncertainties about allocating responsibility. While the possibility of allocating emissions on the basis of cargo/passenger destination (consistent with consumption accounting) was considered, it was judged impractical due to inadequate data.<sup>67</sup> More recent efforts to constrain transport emissions have encountered disagreement over how to apply CBDR. Under

62. US House of Representatives 2009.

63. "Italy Joins French Calls for EU Carbon Tariff," EurActiv.com, April 16, 2010.

64. Clarke 2010b, 10.

65. Zhang 2010, 26–7; Eckersley 2011, 389.

66. Clarke 2010a, 159–160; Clarke 2010b, 10–12.

67. UNFCCC 1996b, para 27.



consumption accounting, emissions associated with transport of goods would be counted in the national inventories of states where goods are consumed. This accounting change might potentially allow transport emissions to be regulated in ways that respect CBDR. For example, transport emissions might be taxed differentially according to a cargo's destination.

### *Technology Diffusion*

A switch to consumption accounting and consumption-based emissions pricing would potentially promote international cooperation and technology diffusion by altering the relationship between CBDR and economic competitiveness, and by creating incentives for developing country producers to invest in emissions reduction. To illustrate, consider just the relationship between China and the US. We might assume that each will seek to enhance its competitiveness by minimizing costs imposed on domestic production. Under production targets the US might fear that increasing its climate-mitigation efforts would make Chinese goods more competitive. However, under consumption-based targets this relationship changes. If the US is required to reduce emissions associated with consumption, the emissions intensity of Chinese imports becomes a legitimate US concern. Measures that assist China to lower its emissions, for example by encouraging the transfer of environmentally friendly technology to China, then become much more consistent with the US's pursuit of its differentiated responsibility. What is more, mitigation action would be encouraged if Chinese producers could capture value from emissions reductions through, for example, lower emissions taxes in their export markets.

### *Disaggregating Emissions*

Many existing proposals seek to resolve the deadlock over developing states' GHG emissions targets by disaggregating national emissions. Some propose sectoral agreements that target specific industries or GHGs while avoiding national emissions caps.<sup>68</sup> Because emissions profiles and abatement opportunities differ widely between industries and among specific GHGs, narrow agreements may enable incentives that maximize participation.<sup>69</sup> Other proposals seek to disaggregate emissions from developing states so that particular regions, such as China's highly developed coastal cities, take on obligations.<sup>70</sup> Arguably affluent people in the developing world should also be targeted by climate policies. A switch to consumption accounting would improve the prospects for many of these "disaggregating" proposals, thereby limiting emissions *within* developing states without requiring them to accept binding *nationwide* emissions limits.

Because substantial affluent communities exist within many developing

68. Schmidt et al. 2008.

69. Barrett 2007.

70. Hu 2009.

countries (and impoverished communities exist in the developed world), efforts to address consumption should not be restricted to the West. Indeed, a “cosmopolitan” view of climate justice holds that people’s responsibilities and entitlements with respect to climate change should be equivalent regardless of their nationality.<sup>71</sup> Due to the immense political obstacles, there has been little progress toward conceptualizing, let alone implementing, cosmopolitan justice.<sup>72</sup> Attention to consumption-linked emissions suggests a possible resolution of this dilemma: efforts to impose climate-related obligations on affluent populations in the developed and developing world alike might include sectoral agreements targeting specific sectors of “luxury” consumption (e.g., aviation and specific manufactured goods) that are closely linked to affluence.<sup>73</sup>

## Conclusion

Technical complexity and the lack of a state champion mean that consumption accounting is unlikely to be adopted in the near future. However, individual states (or cities) could calculate consumption-based inventories, set voluntary consumption-based targets, and experiment with consumption taxes in advance of an international agreement. Indeed, such steps are probably a necessary precursor to coordinated international action because they can demonstrate the potential of consumption-based policies. Ultimately, adoption of consumption-based national targets may offer an alternative way of implementing CBDR that increases the consistency of the climate regime’s norms. Although consumption accounting has many advantages, it is not a silver bullet. Addressing global consumerism and mobilizing international investment in developing-world mitigation are immense challenges.

The ongoing deadlock in climate change negotiations arises due to states’ conflicting priorities. Protagonists commonly express their positions in terms of fairness and justice and are committed to positions from which it is difficult to budge. Consumption-based emissions targets offer an alternative way of implementing CBDR that might reframe these debates in ways that would improve the prospects for international cooperation. Greenhouse gas accounting that emphasizes consumption would not resolve the challenges of climate governance, but it could provide a valuable new perspective amid divided international negotiations.

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71. Caney 2005; Vanderheiden 2008; Baer et al. 2009.

72. Dobson 2006; Grubler and Pachauri 2009, E123.

73. Hertwich and Peters 2009.

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