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Christian Lininger

Consumption-Based Approaches in International Climate Policy

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Foreword

Despite the intentions expressed at the UN climate summits before, at, and after Copenhagen, the world is still waiting for a globally acceptable climate agreement. As a result, present climate policy is characterized by a bottom-up structure consisting of voluntary pledges. This will continue to be true at least until 2020, now the earliest point in time at which a new climate agreement may become effective. Within the current setting, most countries that do pursue climate policy are experiencing a twofold development. While *territorial* greenhouse gas emissions show signs of declining, consumption-based emissions continue to increase, i.e., "dirty" production is simply being outsourced, and consumption and investment structures remain focused on greenhouse-gas-intensive goods. The inability to reduce *global* emissions is clearly evident, as is the inability to effectively address the main objective of any climate mitigation policy, i.e., the reduction of global greenhouse gas concentrations.

In this volume, Christian Lininger provides a very lucid analysis of the potential offered by a shift to consumption-based approaches in the field of climate policy. Written in a language that is at one and the same time scientific, accessible, and fun to read—the latter characteristic no doubt being a reflection of his three decades in journalism—he provides several avenues for raising our understanding of the relevant economic channels. Most importantly, in doing so he opens the box for all—it is not at all necessary to have expertise in his field of economics to follow his analysis.

Christian Lininger is also able to show why simply changing either climate targets or policy instruments to a more consumption-based accounting system will not suffice, irrespective of whether we address the issues from an environmental, economic, or social justice point of view. He then adopts a more positive stance and identifies which additional aspects of climate policy have to be taken care of in order to ensure greater effectiveness and increased social justice.

As an anonymous reviewer of this book put it:

I found the text of this manuscript highly readable and informative. I am not an economist and on first glance thought I would be lost in economic theory. However I did not get lost. A third of the manuscript deals with a literature review on the economic, political and legal background to climate policy and includes an excellent summary of the political hurdles. I do not know of a better summary of the variety of approaches to pricing carbon and what these are likely to achieve.

Part III is insightful and objective on an implementation of consumption-based policy approach. I found the results sometimes surprising and I liked the way the author took the reader through the notion of justice in approaching international climate policy. Chapter 10 was an excellent summary of proposals and their likely outcome.

Overall I think this could be a highly successful book, and may even have an impact on some governments.

Graz, Austria Karl W. Steininger

Acknowledgments

This book is based on my doctoral thesis. It was written during my time as an economist at the Wegener Center for Climate and Global Change of the University of Graz. Research on the subject of this book has benefited from the lively academic environment at the Wegner Center and from numerous discussions with Karl W. Steininger, the head of the Wegener Center's EconClim Research Group. It was Karl who first suggested taking a deeper look into consumption-based approaches to climate policy—a field that turned out to be an extremely rewarding subject for economic study. I am deeply indebted to him for always supporting my research and offering numerous valuable suggestions. Very special thanks also go to Karl Farmer of the Department of Economics of the University of Graz, who guided me through the difficulties of developing the analytical model used in this study. Most of the research for this book was performed as part of the project "RESPONSE," which was financed by the Austrian Climate Research Programme ACRP of the Austrian Climate and Energy Fund. The ideas and contributions of the group within the "RESPONSE" team focusing on consumption-based climate policies—Karl W. Steininger, Susanne Droege, Lukas Meyer, Dominic Roser, and Luke Tomlinson—were all of great help for my own research, as were the extensive discussions with all the other members of the "RESPONSE" team: Birgit Bednar-Friedl, Barbara Buchner, Thomas Schinko, Andreas Tuerk, and Alexa Zellentin. Finally, my English writing was corrected by James Roderick O'Donovan. Completing this book would not have been possible without the help of all these people. Any remaining errors are mine alone.

Contents

Abbreviations

Annex I Parties	Countries that committed to emissions reduction under the UNFCCC
Annex B Parties	Countries that committed to emissions reduction under the Kyoto Protocol
BAT	Best available technology
BCA	Border carbon adjustment
BEET	Balance of emissions embodied in trade
CBDR	Common but differentiated responsibility (a UNFCCC principle)
CDM	Clean Development Mechanism (of the Kyoto Protocol)
CE marking	"Communauté Européenne" marking—indicates a product's compliance with EU legislation
CES	Constant elasticity of substitution
CGE	Computable general equilibrium
CO_2	Carbon dioxide
COP	Conference of the Parties to the UNFCCC
EEE	Emissions embodied in exports
EEI	Emissions embodied in imports
EET	Emissions embodied in trade
EMF	Energy Modeling Forum
ETS	Emissions Trading System (of the EU)
GATT	General Agreement on Tariffs and Trade
GDP	Gross domestic product
GE	General equilibrium
GHG	Greenhouse gas
Gt	Gigatonne
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
LDC	Least developed country
LIC	Low-income country

MAC	Marginal abatement costs
MFN	Most favored nation treatment (a WTO principle)
NAFTA	North American Free Trade Agreement
OECD	Organization for Economic Co-operation and Development
PE	Partial equilibrium
SCM	Agreement on Subsidies and Countervailing Measures
UN	United Nations
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
VAT	Value-added tax
WBGU	Wissenschaftlicher Beirat der Bundesregierung – Globale Umweltveränderungen (German Advisory Council on Global Change)
WTO	World Trade Organization

Chapter 1
Introduction

Abstract This study analyses the potentials and consequences of a change from the current system of a production-based policy orientation in international climate policy to one that is consumption-based. Such a change has been suggested by some authors as a way to improve the global effectiveness of unilateral climate policies followed by industrialized countries. The central research question of this study is whether this indeed is the case. In this introductory chapter, four arguments for adopting consumption-based policies are introduced: such policies currently include a larger share of global emissions; they bring the export sector of emerging economies, which often still offers opportunities for comparatively cheap abatement, into the scope of the policy; they may reduce carbon leakage; and they may help to overcome political opposition to an ambitious climate policy. Then the methodology, structure, and the research objectives of the study are laid out: The first part of the study reviews the economic, legal, and political background and the often contradictory findings on consumption-based approaches in the current literature. The second part investigates—with the help of an analytical model—the effects of different policy variants on environmental effectiveness, cost-effectiveness, carbon leakage, competitiveness and the global distribution of income. The third part attempts to answer the question whether consumption-based approaches are a concept that only works in the idealized setting of stylized analytical models, or whether such policies could prove useful also under "real-world" circumstances. Several criteria and options for practical policy design are discussed.

While the need to swiftly and effectively address climate change is becoming ever more urgent, international climate policy is still characterized by a lack of a worldwide coordinated emissions abatement strategy. In 2009 the Copenhagen Climate Conference failed to agree on a binding international climate treaty. The subsequent UN Climate Conference in Durban in December 2011 once again formulated the objective of working out an international agreement, but that treaty—if, indeed, it is ever signed—is not likely to come into force before 2020. Thus, at least in the short to medium term, global climate policy will be characterized not by a top-down approach, but by what is termed bottom-up or hybrid climate architectures, i.e. unilateral actions and voluntary coalitions between certain countries. To date, such unilateral measures—and also the pledges of

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individual countries to take further abatement actions in the future—do not add up to what would be required in order to avoid overshooting the internationally agreed 2° global warming threshold: the United Nations Environment Programme (UNEP 2013) estimates that the implementation of current pledges would imply a global temperature increase of 3–4 °C by the end of the century compared to the preindustrial period; and the recently completed first volume of the Fifth Assessment Report of the IPCC (2013) predicts a mean temperature increase by the end of the century of about 2.4 °C, even for the second-most optimistic of four greenhouse gas (GHG) concentration scenarios studied.

Thus the current situation is characterized by an urgent need to step up action against climate change, but the constraint that, realistically, in the short run such action will only be possible through unilateral initiatives. The challenge therefore is *inter alia* to increase the effectiveness of unilateral approaches to climate policy. One way to possibly accomplish that goal suggested in the academic literature is a change from the current system of production-based policy orientation to one that is consumption-based. Instead of targeting the emissions discharged on the territory of the country that abates, such a policy focuses on the emissions embodied in the goods the country consumes. If industrialized countries adopted this approach, they could bring the large and increasing amount of emissions embodied in imports from emerging economies into the scope of the policy. This, it has been suggested, might improve the efficiency, cost-effectiveness, and environmental effectiveness of the policy, and might also reduce carbon leakage.

This study will review the literature on consumption-oriented climate policy approaches (and policy approaches that are at least in part consumption-oriented). Employing an analytical model, it will then examine to what extent such approaches can indeed enhance the effectiveness of unilateral abatement policies and the consequences they may have for other criteria important in practical policy formulation such as the global distribution of the cost of the policy or its effect on the competitiveness of individual countries. Finally, drawing on the results of the literature review and the model-based analysis, this study will discuss the question how consumption-based policies could be designed in practice and whether there exist design options that help to realize the possible advantages of consumption-based approaches, while minimizing their possible disadvantages.

1.1 Production-Based vs. Consumption-Based Policy Orientation

Currently, the climate policy of virtually all countries is applied to the emissions directly discharged on their territory. For emissions set free in the production of goods and services, this means recording the emissions at the point of production of these goods, irrespective of where and by whom the goods are later consumed. Emissions recorded according to this principle are therefore often referred to as a

country's "production-based emissions inventory" (e.g. Peters and Hertwich 2008a). Territorial or production-based emissions[1] accounting is also the GHG accounting principle employed by the UNFCCC (1998a, b) in the Kyoto Protocol. However, it is not the only conceivable accounting principle: Alternatively, emissions could be recorded at the point where goods and services are consumed. All emissions that occur in any location worldwide in the course of the production of these goods would then be attributed to this consumption. This is termed "consumption-based accounting", and the emissions base thus determined can also be used as base for unilateral climate policy: for example, a tax could be levied on the emissions "embodied" in every good sold for consumption.

Note that for the world as a whole both emissions measures—the production-based and the consumption-based one—are equal: They record exactly the same emissions, they just do this at different points. For an individual country, however, the two measures typically diverge. This is due to the fact that emissions embodied in imports are "brought into" the country. When the imported goods are consumed in that country, these emissions will be recorded as part of the country's consumption-based emissions inventory, but—as these goods were produced in a different part of the world—they are not counted as part of the country's production-based emissions inventory. The opposite holds true for goods exported: the emissions set free in their production are recorded in the exporting country's production-based emissions inventory but not in its consumption-based one. Thus, the difference between a policy that uses production and one that uses consumption as its base is that the former policy targets the country's exports, while the latter targets the country's imports. Both policies, of course, also include the country's domestic production for domestic consumption within their bases.

1.2 Consumption-Based Approaches and Policy Effectiveness

There are a number of different motivations for advocating the adoption of consumption-based emissions abatement policies—this study will, however, analyze only one of these motivations in greater detail: the argument that a consumption-oriented policy, pursued by a coalition of industrialized countries (e.g. by the EU or by a broader coalition of, say, all OECD countries), is potentially more effective than the current production-based approach. Various indicators for the effectiveness of a climate policy will be used, for example cost-effectiveness, environmental effectiveness, or carbon leakage. In the academic literature on unilateral climate policy, different reasons are given (or in some cases at least

[1] For an explanation of the difference between the terms "territorial" and "production-based" emissions accounting see Footnote 2 of Chap. 2.

suggested) why a consumption-based approach—according to one of these indicators—should indeed be more effective:

- With current worldwide production and trade patterns, *a consumption-based policy by industrialized countries includes a larger share of global emissions* than a production-based policy. This result is mainly due to the far higher carbon-intensity of the exports of emerging economies compared to the exports of most industrialized countries (e.g. Davis and Caldeira 2010). Peters and Hertwich (2008b, 57) argue that one of the advantages of a consumption-based approach in such a situation is that the "emission commitments for developing countries are not as important" in achieving a global emissions reduction goal. While Peters and Hertwich do not discuss it in these terms, one can use this argument also to draw conclusions on the cost-effectiveness of a consumption-based policy: if, as it is usually assumed, marginal abatement costs rise with the quantity of emissions abated, then to reach a given absolute abatement target it is cheaper to abate a smaller percentage from a larger emissions base then to abate a larger percentage from a smaller emissions base. Therefore, enlarging the emissions base by switching to a consumption-based approach may increase the cost-effectiveness of the policy (Steininger et al. 2014). Furthermore, within the last two decades, for industrialized countries the gap between production- and consumption-based emissions has rapidly grown wider (e.g. Peters et al. 2011)—thus the weight of this argument is constantly increasing.
- Global cost-effectiveness also requires that emissions be abated in those countries where this can be done most cheaply (Weyant and Hill 1999). This is sometimes termed "where-flexibility". Obviously, marginal abatement costs are high in countries that have already partly decarbonized their economy (like many industrialized countries), but are effectively zero in countries without a climate policy—like some developing and emerging economies. Thus abatement in developing and emerging economies should be more cost-effective (Barrett 1998; Stern 2007). Here, this well-known argument will be taken one step further: even if developing countries do not follow a climate policy themselves, industrialized countries might still be able to exploit some of these low-cost abatement opportunities. By pursuing a consumption-based policy they can *bring the export sector of developing and emerging economies into the scope of the policy*. According to this line of reasoning, overall costs for a consumption-based policy will be lower than those for a policy that is production-based (Steininger et al. 2014).
- The introduction of a production-based policy raises the costs and thus the prices of goods produced in abating countries. Consumers (demanding final products) and producers (demanding intermediate products) thus have an incentive to substitute goods from non-abating countries (that are now relatively cheaper) for the more expensive goods that are subject to the policy. Thus, production and, as a consequence, emissions in non-abating countries will rise and in this way counteract the reduction of emissions in abating countries. This effect is known as carbon leakage (more exactly, carbon leakage through the

"competitiveness channel"): instead of being reduced on a global level, emissions are just shifted across borders (to non-abating countries). The greater such carbon leakage, the smaller the reduction in global emissions achieved by the abatement policy, i.e. the smaller its environmental effectiveness. If, on the other hand, through the introduction of a consumption based-policy, imports of abating countries are also subject to the policy (and their prices thus also raised), while exports from abating countries are exempted from the policy, then such *leakage effects will be avoided*. A consumption-based policy may therefore be environmentally more effective. This is probably the best-known argument in support of consumption-based policy approaches, suggested in numerous studies (e.g. Peters and Hertwich 2008b).

– A related argument can be made as regards the effects of a climate policy on competitiveness: the cost increase caused by the abatement policy also lowers the competitiveness of industry in abating countries. Firms in abating countries are therefore typically opposed to stringent unilateral abatement measures, and their resistance may make it politically impossible for governments to commit themselves to such measures. If, however, the competitiveness of domestic industry could be protected, this would allow countries to unilaterally pursue a more ambitious climate policy. One way to protect industry's competitiveness is a switch to a consumption-based policy—this would, as is often argued, "level the playing field between domestic and foreign producers." Noted that this argument is not about protecting domestic industry as an end in itself, but about *overcoming political opposition to an ambitious climate policy* (Grubb 2011; Cosbey et al. 2012).

These four arguments may appear convincing at first sight—still, as will become clear in the course of this study, they are valid only under certain assumptions and in certain circumstances. Thus, it is far from clear how useful they are for developing climate policies that work in a real-world setting, i.e. whether it is indeed possible to improve the effectiveness of the existing global climate policy framework by switching the accounting base. Most of this study will be devoted to a detailed analysis of this question.

Various authors have, however, suggested that, instead of attempting to formulate climate policies within the current global policy framework, this framework should be completely reformed. For example, the German Advisory Council on Global Change (WBGU) has proposed an alternative way to allocate abatement obligations between individual countries. Instead of agreeing on percentage emissions reductions relative to the status-quo or to some reference scenario, the Advisory Council suggests proceeding as follows: in a first step it would be necessary to establish the "GHG disposal space" in the atmosphere that would remain if the global temperature increase were limited to 2°. In a second step, this disposal space would then be distributed in the form of "emissions budgets" among individual countries (WBGU 2009). As Droege (2011) remarks, the debate on an equitable division of these emission rights is related to the question of consumption-based policy approaches. The proposed "emission budgets" could refer either to

production-based, or alternatively to consumption-based emissions. Thus, if indeed a switch to a new system for the allocation of abatement obligations is considered, then the choice between a production- and a consumption-based system should be based on a clear understanding of the different consequences of these two systems. The debate on such a reform therefore provides additional impetus for studying the effects of consumption-based policies.

1.3 Two Strands of Literature and a Controversial Political Debate

In recent years, a switch to a consumption-based policy orientation has been explicitly or implicitly discussed by two lines of the economic literature. These discussions have revolved not only around policy-effectiveness arguments (listed in the previous section), but also around a number of other criteria deemed important: In one of the two literature strands, the *literature on emissions embodied in trade*, many authors argue that it is "fairer" to make countries partly or wholly responsible for the emissions triggered by their domestic consumption, rather than just their production-based emissions (Kondo et al. 1998; Munksgaard and Pedersen 2001; Ferng 2003; Bastianoni et al. 2004; Peters and Hertwich 2006; Lenzen et al. 2007). A second core field of research of this strand of literature is emissions "transfers" between countries by means of international trade. Virtually all studies on this subject reveal a common characteristic: emissions embodied in goods are exported mainly from emerging economies to consumers in developed countries, and these inter-country carbon flows are rapidly growing over time (e.g. Davis and Caldeira 2010; Peters et al. 2011). In terms of its impact on the environment, this development is seen as worrying, as increasing amounts of the goods consumed in countries with binding mitigation targets (which, however, limit only emissions in production, but not in consumption) are produced in countries without such targets (Peters and Hertwich 2008a). Even though the literature on emissions embodied in trade does not suppose that these trends in emission transfer are caused by current (production-oriented) climate policy, some authors suggest basing international climate policy on consumption-based accounting as a countermeasure (Peters and Hertwich 2008a, b; Nakano et al. 2009; Wiedmann 2009).

The second line of literature, the *literature on carbon border adjustments*, indirectly also discusses switching to a consumption-based approach—although in that strand of literature this term is generally not used. Carbon border adjustments work as follows: the region that abates bases its policy on production-based emissions accounting, but supplements that policy by import taxes[2] and export rebates. The import taxes are levied on the carbon-content of products originating

[2] There exist other forms of border adjustments apart from taxes—see Sect. 2.2.3. The expression "taxes" is used—without loss of generality—merely to keep the discussion simple.

from countries not following an equally stringent climate policy, and the export subsidies are granted to domestic producers for the carbon content of exports to countries with a less stringent policy. If such import taxes and export rebates are applied to all products according to their true carbon content, and if the carbon price charged or rebated equals the domestic carbon price, the measures represent a full switch to a consumption-based policy approach; or, to use the language of the literature on international taxation, a switch in the carbon tax system from an origin basis to a destination basis.

The literature on carbon border adjustments, however, usually does not assume such a "full switch"—the adjustments are typically not envisioned for all goods, but only for the products of carbon-intensive industries; additionally they are often not based on a precise calculation of the carbon content of these goods. The reason is that in this strand of literature the objective of the border adjustments is defined more narrowly: the adjustments are not introduced for reasons of fairness or out of a principled belief that the carbon price applied to different products must always be the same, but as one of a number of possible ways of achieving some practical policy goals—to protect industries deemed at risk of loss of competitiveness or to stem carbon leakage triggered by unilateral climate policy. Protecting the competitiveness of certain industries—if pursued as an aim in itself and not as a means of overcoming political opposition to a more stringent climate policy—is, of course, not an environmental objective. Therefore this study will not analyze competitiveness issues in-depth. A basic understanding of competitiveness concerns—as discussed in the border adjustment literature—will, however, help to grasp the political controversies triggered by the pursuit of unilateral climate policies.

At any rate, the scenarios studied in the literature on border carbon adjustments do not qualify as examples of a "pure" consumption-based policy. But, as we will see in the course of this study, it is questionable whether a "pure" consumption-based policy can actually be implemented in a real-world setting; and secondly, the analysis of a "less-than-full" switch to consumption-based accounting will also provide valuable insights into the consequences of switches of the policy base.

The question whether border carbon adjustments do indeed help to protect the competitiveness of industries at risk and to stem carbon leakage is studied in this strand of literature by quantitative sectoral as well as computable general equilibrium (CGE) models. The results diverge vastly—they range from findings that confirm that border measures are effective in curbing both leakage and competitiveness losses to results which state that they can fulfill neither objective (see Chap. 5 for a review of these studies and the respective references). One reason for the huge discrepancy in results may be that the studies start from quite different assumptions on the size of the abating coalition, the range of products included, the way in which the border adjustments are calculated, and the question whether the adjustments consist only of an import tariff, or also of an export rebate. At any rate, currently there is still no consensus in this strand of literature on the question whether—and if so, under what conditions—the introduction of border carbon adjustments can be recommended. One recent study comparing 12 simulation models not only assesses the impact of border measures on carbon leakage and competitiveness, but also on

cost-effectiveness. This study finds that improvements in terms of cost-effectiveness are only modest, but that, on the other hand, the border measures shift the economic burden of emissions reduction to non-abating countries (Boehringer et al. 2012).

Apart from these two strands of the recent economic literature there exists an older theoretic literature on unilateral climate policy measures (Markusen 1975; Hoel 1996). These contributions find that border adjustments can improve the efficiency of a unilateral policy, but that typically the most efficient outcome is not achieved by a "full" adjustment that completely changes the accounting base, but rather by a policy that combines the taxation of production with the taxation of consumption—and that typically also applies different carbon tax rates to different economic sectors. To see why, note that a policy that combines the taxing of both production and consumption includes more sectors of the global economy than either a "pure" production-based or a "pure" consumption-based policy. But bringing additional sectors within the scope of the policy and having the possibility to freely set the carbon tax rate in these sectors (which may be positive or negative) as well as to adjust the carbon tax rates in all other sectors clearly enlarges the set of choices available when designing an efficient policy. Thus such a policy can never be less efficient and will typically be more efficient than either of the two "pure" policy variants.

Notwithstanding the ambiguity of the findings on their effectiveness, the idea of carbon border adjustments has triggered an intense and often controversial political debate. In Europe, such measures have repeatedly been called for by industry representatives as well as some politicians, for example the former French President Nicholas Sarkozy. In the U.S., the introduction of a cap-and-trade regime was discussed in 2009. There, provisions for border adjustments were included in all proposed congressional bills. In the end, the Senate did not approve any of these bills—and the plans for the cap-and-trade system were abandoned (Clapp 2010). Still, many authors (e.g. Van Asselt and Brewer 2010) believe that the debate on border measures is far from over. Van Asselt and Brewer also note that—especially in the U.S.—calls for border measures are motivated mainly by competitiveness arguments, rather than by environmental concerns.

The response to these proposals from the countries possibly targeted by the measures—emerging economies—was immediate and fierce: they asked the UNFCCC to ban border carbon adjustments (Khor and Jhamtani 2009). For emerging economies, gains in the relative competitiveness of industrialized countries correspond to losses in the competitiveness of their industry. Additionally, emerging economies also fear general welfare losses through border adjustments—as, for example, predicted by the model comparison study mentioned above (Boehringer et al. 2012). Just how intense the controversy can become, is shown by the vehement reaction from both emerging economies and industrialized countries to the EU's recent decision to introduce an aviation emissions levy (which has some similarities to a border carbon tax).

Border carbon adjustments are not the only way to change the emissions accounting base to a consumption-orientation—this study will also discuss a different proposal for switching to a consumption-based policy as well as measures to

alleviate negative distributional impacts on developing and emerging economies. Still, given the "long-standing negative experience in developing countries with trade talks" and the absence of "trust" in the motives of industrialized countries (Droege 2011, 1197), the introduction of consumption-based policy approaches will remain a controversial idea.

1.4 Methodology, Structure, and Research Objectives

The objections voiced in developing and emerging economies to border carbon adjustments (and therefore, presumably, to every form of consumption-oriented policy) make it all the more important to examine whether consumption-based approaches can indeed further environmental objectives—or whether they are only another form of "protectionism," (Droege 2011, 1197), as is often claimed by these countries. As discussed in the previous section, the academic literature has so far not given a final and unanimous answer to this question. This study aims to contribute further to the respective discussion. In contrast to much of the existing literature, the discussion will however not be framed in the tradition of only one of the literature strands introduced in the previous section; rather the aim is to draw from the findings and arguments of all of these traditions in order to compare the different approaches and to make best use of all of the current knowledge in this field of research. The study is structured into three parts, each of which pursues quite distinct research objectives.

1.4.1 A Common Perspective on Hitherto Separate Literature Strands

The first part of the study introduces the central concepts needed for the following analysis—it provides the economic, the political, and the legal background—and it reviews the literature on consumption-based abatement policies, in particular the two literature strands mentioned above, the literature on emissions embodied in trade and the literature on border carbon adjustments. One might argue that a literature review only seldom reveals new facts or arguments—but in the field of the economics of unilateral climate policy this might be different: the two literature strands have for some years existed side by side—but only rarely has an attempt been made to compare their arguments, their findings, or their policy recommendations (Steininger et al. (2014) is one of the few exceptions). This study, in contrast, aims to critically review the literature from the two strands, to examine where these strands produce comparable results, and where they diverge. To give a few examples: