

RESEARCH ARTICLE



## The untapped potential of preferential trade agreements for climate governance

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### ABSTRACT

The regulatory contribution that preferential trade agreements (PTAs) make to global climate governance is assessed through an analysis of climate-related provisions found in 688 PTAs signed between 1947 and 2016. Provisions are analyzed along four dimensions: innovation, legalization, replication, and distribution. Innovative climate provisions are found in several PTAs that are in some cases more specific and enforceable than the Kyoto Protocol and the Paris Agreement. Nonetheless, these climate provisions offer limited progress because they remain weakly 'legalized', fail to replicate broadly in the global trade system, and were not adopted by the largest greenhouse gas emitters. Despite the inclusion of innovative climate provisions in a number of PTAs, their poor design and weak replication position them as some of the weakest environmental provisions within PTAs.

**KEYWORDS** Climate change; trade; strategic linkage; international negotiations; trade agreements; institutional interactions; regime complex

### Introduction

As climate negotiations within the United Nations Framework Convention on Climate (UNFCCC) have proven slow and produced unambitious results, scholarly attention has turned toward climate policy developments elsewhere. Scholars now characterize climate governance as polycentric; they increasingly focus on how a diverse set of actors, operating through multinodal architectures across scales, can contribute to raising mitigation ambition (Ostrom 2010).<sup>1</sup> Although scholars disagree on the empirical outcomes of such polycentricity, they have devoted much attention to the mapping of such efforts across a wide swath of actors and institutions (Jordan *et al.* 2015). Many have detailed, for example, the important progress regional governments, city networks, private actors, nongovernmental actors, and transnational partnerships have made in tackling climate change (Bulkeley and Betsill 2005, Andonova *et al.* 2009, Abbott 2012, Green 2014,

Allan and Hadden 2017). Several scholars have also explored the potential role of the World Trade Organization (WTO) in either contributing to or constraining climate governance (Green 2005, Kuloesi 2014). Yet, the contribution of preferential trade agreements (PTAs) to climate governance remains underexplored. Here, we begin to assess the *regulatory* contribution that PTAs make to global climate governance.

Environmental provisions in PTAs have become increasingly far-reaching over time. Early PTAs merely replicated the WTO's environmental provisions. More recent PTAs typically include a full-length chapter entirely devoted to environmental protection, with precise and enforceable obligations on various environmental issue areas (Morin *et al.* 2017). PTAs have already made significant contributions to biodiversity governance. For example, the United States (US)–Peru PTA catalyzed the implementation of mahogany-related provisions of the Convention on International Trade in Endangered Species (CITES) in Peru. This resulted in the recategorization of Peru into the highest CITES compliance category (Jinnah 2011). Likewise, some recent PTAs include provisions on genetic resources and the protection of traditional ecological knowledge that go well beyond the 2010 Nagoya Protocol (Jean-Frédéric and Gauquelin 2016). Although it is yet premature to fully understand the environmental impact of these PTA environmental provisions, recent studies have suggested that PTAs do play a role in articulating new environmental norms (Morin *et al.* 2017) and diffusing environmental policies across borders (Jinnah and Lindsay 2016). With multilateral climate negotiations faltering, PTAs could play an important role in the emerging polycentric landscape of climate governance. Just as some PTAs have reached beyond the scope of multilateral biodiversity agreements, one can similarly imagine a PTA with mitigation and adaptation commitments that go beyond the Paris Agreement.

The potential contribution of PTAs to climate governance rests on four distinctive features of trade negotiations. First, rather than bringing several countries together around a relatively integrated issue area, as multilateral environmental agreements (MEAs) do, PTA negotiations involve a limited number of partners addressing a multitude of different issues. This context fosters bargaining and the conclusion of new agreements. Second, PTAs are based on direct reciprocity, and thus in principle open the door to retaliation through sanction-based dispute settlement should states violate their climate-related provisions. Some PTAs' dispute settlement mechanisms, particularly those contained in recent US agreements, already offer stronger incentives, such as sanction-based dispute settlements, to comply with agreed commitments than do MEAs, which typically have weaker compliance mechanisms (Jinnah and Lindsay 2016).<sup>2</sup> Third, PTAs offer opportunities for policy experimentation, as several new PTAs are negotiated every year, with diversity in types and membership. In this way, they act as

institutional laboratories to design and test climate provisions at a limited scale and among like-minded countries. Fourth, PTAs are uniquely positioned to address trade-related aspects of mitigation, such as the export of low-emission technologies, border-tax adjustments on polluting production processes, fossil fuel subsidies, and trade in carbon credits. These four features of trade negotiations led a number of analysts to argue that PTAs can potentially contribute to climate governance (OECD 2007, Whalley 2011, Gehring *et al.* 2013, Leal-Arcas 2013, van Asselt 2017). However, this is the first study to assess the actual regulatory contribution of the full landscape of PTAs to global climate governance.

Our assessment focuses on the quality and quantity of climate change provisions included across all PTAs. To be clear, we do not aim to explain why certain countries include climate-related provisions in their PTAs while others do not. Likewise, we do not assess the impact of these provisions in addressing climate change through, for example, resulting emission reductions.<sup>3</sup> We do not assert a causal connection here. Rather, our analysis assesses the regulatory contribution that PTAs make to global climate governance by manually coding the climate-related provisions contained in 688 PTAs signed between 1947 and 2016. We first identified these climate-related provisions in the TRade and ENvironment Database (TREND) (Morin *et al.* 2018); we borrowed the collection of trade agreements from the Design of Trade Agreement (DESTA) Project (Dür *et al.* 2014).<sup>4</sup>

We assess PTAs' regulatory contribution to climate change along four interacting dimensions: innovation, legalization, replication, and distribution. These dimensions are original to this study and were selected to examine climate provisions' scope and diversity (innovation), their legal strength (legalization), their relative presence in the overall PTA population (replication), and the type of countries that have endorsed them (distribution). For PTAs to significantly contribute to the regulation of climate governance, they need to include comprehensive climate provisions, be highly enforceable, be quantitatively numerous and cover countries that qualitatively matter the most for climate governance.

Centrally, we find a high degree of regulatory innovation in climate provisions in the PTAs included our sample. These provisions do not simply echo those under the UNFCCC umbrella, but, in some cases, are more specific and more enforceable than the Kyoto Protocol and the Paris Agreement. We argue here, however, that these regulatory innovations make a weak contribution to broader climate governance because they remain weakly 'legalized,' failed to replicate broadly in the global trade system, and were not adopted by the largest greenhouse gas (GHG) emitters. As such, despite the inclusion of innovative climate provisions in several PTAs, their weak design and limited replication position them as some of the most feeble environmental provisions within PTAs globally.

In the next section, we present the regulatory climate innovations that we find in PTAs, and group them into eight categories. Then, we argue that, despite the wide variety of these climate provisions, climate-related provisions remain weak because they are poorly legalized, before arguing that climate provisions have failed to replicate across PTAs, especially when compared with other environmental issues. Finally, we argue that climate-related provisions are further weakened by their lack of uptake by large GHG emitters.

## Innovation

PTAs tend to be highly standardized. New trade agreements often replicate provisions from earlier agreements (Allee and Elsig 2016). In some instances, however, they introduce novelties not present in any previous agreements. Following Morin *et al.* (2017), we call these unprecedented provisions ‘regulatory innovations.’ As innovating can be costly and risky due to transaction costs and unintended consequences, tracking such innovations not only reveals new governance forms but also where and when negotiators were particularly committed to tackle this problem.

We have identified eight categories of PTA regulatory innovations that directly address climate change (Table 1). We then detail the climate change objectives of each category, their historical evolution, and important differences in wording between PTAs.

## Renewable energy and energy efficiency

The most common climate-related provisions in PTAs address renewable energy or energy efficiency – with 138 such provisions in PTAs adopted by China, Japan, India, Korea, Mexico, the US, and the European Union (EU). Energy-related provisions are also some of the oldest environmental provisions in PTAs. Indeed, as early as 1979, the Lomé II convention, between Europe and the ACP (African, Caribbean, and Pacific) countries, promoted solar, geothermal, wind, and hydroelectric technologies. Many countries subsequently also included provisions on research, cooperation, assistance, project development, and the exchange of information on renewable energy and energy efficiency. The 2014 agreement between Australia and Korea, for example, calls on parties to organize joint activities, to exchange views on policy, and to enhance scientific exchange on ‘energy efficiency measures and measures relating to climate change’ (art. 16.14). A 2011 agreement between Korea and Peru goes even further by including a provision ‘encouraging public and private institutions related to small and medium-sized enterprises to cooperate in [...] renewable energy, and other subjects of mutual interest’ (2011, art. 20.4).

**Table 1.** Eight categories of provisions directly related to climate change.

Category of provision	First PTA to include it	Year	Excerpt	Number of PTAs
Promotion of renewable energy	Lomé II	1979	'The Community will assist <i>inter alia</i> , in the [...] implementation of alternative energy strategies in programmes and projects that will [...] cover wind, solar, geothermal and hydro-energy sources'	70
Promotion of energy efficiency	Lomé II	1979	'The Community will assist <i>inter alia</i> , in the [...] production in the ACP States of equipment for the production and distribution of energy as well as the application of energy-saving techniques'	68
Cooperation on climate governance	EU–Poland /Hungary	1991	'Cooperation shall centre on [...] global climate change'	38
Reduction of GHG emissions	Lomé IV	1989	'The Parties recognize the value of exchanging views, using existing consultation mechanisms under this Convention, on major ecological hazards, whether on a planetary scale (such as the greenhouse effect)'	31
Adaptation to climate change	China–Costa Rica	2010	'The Parties shall cooperate to [...] promote effective risk management in the agribusiness chains aiming to incorporate measures for adaptation [...] of climate change [...]'	14
Ratification or implementation of Kyoto	EU–Montenegro	2007	'Special attention shall be paid to the ratification and the implementation of the Kyoto Protocol.'	13
Ratification or implementation of UNFCCC	Common Market for Eastern and Southern Africa	1993	'The Member States [...] agree to: [...] accede to the UNCED Agreements relating to the Conventions on climatic change and biodiversity'	7
Harmonization of climate regulation	EU–Ukraine	2014	'Ukraine undertakes to gradually approximate its legislation to [...] Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community [...]'	2

In this table and elsewhere here, we refer to trade agreements by the more readily identifiable treaty or association name.

### Cooperation on climate governance

Provisions related to cooperation on climate governance are relatively prolific. Such provisions have been included in 38 PTAs since before the UNFCCC was agreed. In 1991, for example, the EU concluded agreements with Poland and Hungary, which required cooperation on climate change matters by encouraging dialogue on the issue between trading partners (Jinnah and Morgera 2013). Some PTAs are more specific and ask parties to cooperate

in the development of coordinated measures on climate issues. Recently, some PTAs incorporated provisions that required states to cooperate in ‘trade-related aspects of international climate change regimes’ (Australia Korea, 2014, art. 18.8). These ‘trade-related aspects’ may potentially include the use of protectionist measures to assist domestic renewable energy producers (e.g. subsidies), or to level the playing field with countries that do not attempt to reduce their GHG emissions (e.g. border tax adjustments).

### *Reduction of GHG emissions*

A total of 31 PTAs directly address the reduction of GHG emissions. Many of them address mitigation vaguely by, for example, promoting general cooperation on the issue. For example, the agreement between the EU and South Africa invites parties to collaborate on ‘issues surrounding the reduction of greenhouse gas emissions’ (1999, art. 84). The more recent agreement between the EU and Central America is slightly more specific, stating that ‘cooperation shall in particular address [...] the strengthening of carbon market mechanisms’ (2012, art. 50). Other agreements, including the Indonesia–Japan Economic Partnership Agreement, refer directly to the Kyoto Protocol’s Clean Development Mechanism (2007, art. 39). Some PTAs promote trade in environmental goods and services specifically related to GHG emissions. The agreement between the EU and Georgia provides that ‘parties shall strive to facilitate the removal of obstacles to trade or investment concerning goods and services of particular relevance to climate change mitigation [...]’ (2014, art. 231). This agreement also states that cooperation between the EU and Georgia shall aim at ‘promoting measures at international level [...] in the areas of [...] research, development, demonstration, deployment and diffusion of safe and sustainable low carbon [...] technologies’ (2014 art. 308). Other PTAs are far more specific. A 2012 agreement between Australia and Malaysia, for example, details requirements related to the transfer of carbon capture capacities between the two countries.

### *Adaptation to climate change*

Climate adaptation provisions appear less frequently in PTAs than do climate mitigation provisions. Only 14 PTAs include a provision directly related to adaptation. Most of these 14 PTAs vaguely call for greater cooperation in the area of adaptation and the adoption of measures that promote climate change adaptation. For example, the agreement between Korea and Peru states that each party ‘shall adopt policies and measures [...] for evaluating the vulnerability and adaptation to climate change’. (2011, art. 19.8). The agreement between Moldova and the EU requires

parties to cooperate on ‘adaptation to climate change’ and the development of ‘adaptation technologies’ (2014; art. 93).

Other PTAs address the adverse effects of climate change in specific sectors like forests, fisheries, and agriculture. Agricultural adaptation is an area where PTAs could facilitate particularly important action on climate governance due to its economic centrality and high climate vulnerability in many developing countries. Several agreements thus include agricultural adaptation provisions. For example, the agreement between China and Costa Rica calls on parties to ‘promote effective risk management in the agribusiness chains aiming to incorporate measures for adaptation [to] climate change [...]’. The agreement between Korea and Australia similarly highlights the importance of agricultural adaptation and calls on parties ‘to promote cooperative activities in [...] climate change adaptation [...]’ in that sector (2014, art. 16.4).

### *Ratification or implementation of climate agreements*

A total of 13 PTAs require their parties to ratify or implement a specific climate agreement. In 1993, the Common Market for Eastern and Southern Africa (COMESA) was the first PTA to provide that its parties must accede to the UNFCCC. At the time, 17 COMESA countries had not yet ratified the UNFCCC but they all did so in the months following their signature of COMESA. However, it was more than 10 years after adoption of the Kyoto Protocol in 1997 before there was reference to the Protocol in a PTA. The first was the EU–Montenegro agreement, which provides that ‘special attention shall be paid to the ratification and the implementation of the Kyoto Protocol.’ (2007, art. 111).

Some PTAs give an important status to multilateral climate agreements by providing that ‘nothing in this Agreement shall limit the right of a Party to adopt or maintain measures to implement [these] agreements [...]’ (EU, Colombia and Peru 2012, art. 270.4). This provision would support an interpretation of the trade agreement favorable to the Kyoto Protocol in case of legal incompatibility. However, the agreement also makes clear that measures to implement MEAs ‘shall not be applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between the Parties or a disguised restriction on trade’ (EU Colombia Peru 2012, art. 270.4). As such, these climate provisions are typically weak and their compatibility with trade law remains murky in the event of any future conflict.

### *Harmonization of climate regulation*

Only two PTAs, both signed by the EU, require harmonization of climate change regulation across Parties. The EU typically introduces

harmonization provisions into its PTAs with countries seeking accession. Recently, the EU has also included references to harmonization of legislation related to climate change. For example, the EU's agreements with Ukraine and Moldova both provide that the latter countries shall 'gradually approximate [their] legislation to [...] Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community [...]'.<sup>1</sup>

### *Other provisions indirectly related to climate change*

Several PTAs include environmental provisions that are not specifically related to climate change but could be useful in addressing it. As Table 2 reveals, many of these provisions are more common than provisions addressing climate change directly. For example, one of the most frequent environmental provisions is an exception to trade commitments for the conservation of natural resources. This exception arguably could therefore justify trade-restrictive measures that aim at conserving the global atmosphere. Several dozen PTAs also include provisions providing that the level of environmental protection should not be weakened to attract trade or investments. While not addressing climate change directly, these environmental provisions may provide legal justification for cooperation on climate change matters under the auspices of these PTAs.

Provisions related to air pollution are particularly relevant to climate change because air pollution often covaries with GHGs emissions, and can therefore be used to indirectly mitigate GHG emissions. We found 46 PTAs with such provisions on air pollution and vehicle emissions. In several of these PTAs, states agree to participate in joint work programs or to coordinate their strategies (e.g. COMESA 1993). Some agreements also reiterate existing provisions from specific bilateral agreements addressing air pollution (e.g. China–Korea 2015). Recent European agreements are perhaps the most related and precise, as they regularly provide for specific vehicle emissions standards (e.g. EU–Montenegro 2007).

Another category of provisions that is indirectly related to climate change concerns is natural disaster-related provisions, whose importance will likely increase as the frequency and intensity of disasters increase in the face of climate change. The Treaty of Rome (1957) was the first to introduce a provision facilitating assistance to other members in case of a natural disaster. It provides exceptions to general trade principles, especially for the awarding of contracts to facilitate rapid response efforts. Other PTAs create financial mechanisms to facilitate and accelerate the distribution of aid (e.g. Yaoundé I, 1963, art. 39). Some of them also provide rules governing the distribution of aid in the case of natural disasters and addressing delays in payments and level of contributions (e.g. Lomé III, 1984, art. 203.8). Other PTAs include



**Table 2.** Selection of provisions indirectly related to climate change.

Category of provision	First PTA to include it	Year	Excerpt	Number of PTAs
Exception for the conservation of resources	General Agreement on Tariffs and Trade	1947	'Nothing in this Agreement shall be constructed to prevent the adoption or enforcement by any contracting party of measures [...] related to the conservation of exhaustible natural resources [...].'	324
Cooperation on environmental matters	European Economic Community – Algeria	1976	'The Purpose of cooperation between the Community and Algeria shall be to promote in particular [...] the protection of the environment'	161
Should not lower environmental protection	North American Free Trade Agreement	1992	'The Parties recognize that it is inappropriate to encourage investment by relaxing domestic [...] environmental measures.'	93
Technical assistance	Lomé II	1979	'The Community will assist, <i>inter alia</i> , in [...] implementation of measure that will minimize the negative impact of energy production on the environment.'	90
Enforcement of environmental measures	North American Agreement on Environmental Cooperation (NAAEC)	1992	'The Council shall encourage an effective enforcement by each Party of its environmental laws and regulations.'	84
Public awareness on the environment	Lomé III	1984	'The Contracting Parties undertake to promote [...] the prevention of pollution.'	76
Improvement of environmental protection	African Economic Community	1991	'Member states [...] shall adopt national, regional and continental policies, strategies, and Programmes and established appropriate institution for the protection and enhancement of the environment.'	64
Trade in environmental goods	Annex to the European Free Trade Association	2001	'Member states undertake [...] to foster trade in organically produced agricultural products and foodstuffs.'	53
Exception to protection against expropriation	US–Singapore	2003	'Regulatory actions by a Party that are designed and applied to protect [...] the environment, do not constitute indirect expropriation.'	53
Air pollution	European Economic Community–Romania	1991	Cooperation shall aim at [...] combatting local, regional and transboundary air [...] pollution.'	46

(Continued)

**Table 2.** (Continued).

Category of provision	First PTA to include it	Year	Excerpt	Number of PTAs
Participation in the adoption of environmental measures	NAAEC	1992	'Each Party shall [...] provide interested persons and Parties a reasonable opportunity to comment on [environmental] measures.'	46
Capacity building	European Economic Community – Poland	1991	'Parties plan to [...] exchange [...] information and experts dealing with the transfer of clean technologies.'	46
Evidence-based environmental measures	Single European Act	1986	'In preparing its action relating to the Environment, the community shall take account of available scientific and technical data.'	35
Assistance related to natural disasters	Treaty of Rome	1957	'The following shall be deemed to be compatible with the Common Market: [...] (b) aids intended to remedy damage caused by natural calamities or other extraordinary events'	27
Domestic impact assessment	NAAEC	1992	'Each party shall [...] assess, as appropriate, environmental impacts.'	8
Investment in environmental research	NAAEC	1992	'Each Party shall [...] further scientific research and technology development in respect of environmental matters.'	8
Monitoring the state of the environment	NAAEC	1992	'Each Party shall [...] periodically prepare and make publically available reports on the state of the environment.'	4
Differentiated responsibility principle	EU–Colombia–Peru	2012	'The Parties reiterate their commitment to address global environmental challenges, in accordance with the principle of common but differentiated responsibilities.'	2

detailed provisions on cooperation to reduce the vulnerability of Parties to natural disasters, including by building research, monitoring, early-warning, prevention, rehabilitation and reconstruction capabilities (e.g. China–Costa Rica, 2010, art. 124). Some PTAs even include provisions regarding assistance to third countries, such as the European Lisbon agreement (2007, art. 188j).

Finally, two PTAs reiterate a core principle of the global climate regime, common but differentiated responsibilities (CBDR), which seeks, in part, to guide the fair distribution of emission reduction responsibility between countries. Although antithetical to the global trade regime's central premise

of nondiscrimination, two recent European agreements (EU–Colombia–Peru and EU–Central America) included explicit references to CBDR.

In sum, we find an impressive degree of innovation as related to climate change across the 688 coded PTAs, with eight distinct categories of policy innovation in this area. Innovations related to energy efficiency and renewable energy are particularly prolific, but we also find several other less utilized but nonetheless important innovations related to, for example, GHG mitigation and, to a lesser extent, adaptation. Finally, we identify several other provisions that do not reference climate change specifically, but have indirect climate relevance, for example as related to air pollution. These indirect provisions may provide states with the latitude to innovate further, through PTA implementation, if they chose to interpret these provisions as relevant to climate change.

### Legalization

To complement our analysis of the contribution of PTA climate provisions to climate governance, we measure the legalization of these provisions. Legalization is an important metric because it reflects the strength of climate governance through PTAs. We define legalization along three dimensions: obligation, precision, and delegation (Abbott *et al.* 2000:17–18). Obligation refers to the strength of the commitment that states make. Precision limits parties’ discretion by narrowing the possible interpretations of a rule. Delegation is related to the contribution of external actors, including judicators, in implementation and enforcement. If all three dimensions are strong, we classify the PTA as highly legalized. At the other end, low legalization happens when obligation, precision and delegation are weak. Between these two extremes there are several moderate degrees of legalization.

Based on these definitions, we have identified specific indicators to evaluate the degree of obligation, precision, and delegation of PTAs climate change provisions (see Table 3). We measure the level of obligation along a six-degree continuum, ranging from an explicit negation of intent to be

**Table 3.** Coding legalization.

	Obligation	Precision	Delegation
Least legalized (0)	0.0. Explicitly not binding	0.0. General reference	0.0 Political bargaining
	0.2. Mere recognition	0.3. Discretionary measure	1.0 Judicial mechanism
	0.4. Optional commitment	0.6. Detailed measure	
	0.6. Hortatory commitment	1.0 Specific target	
	0.8. Implicit commitment		
	1.0 Binding commitment		
Most legalized (1)			



legally bound (low legalization) to a legally binding commitment (high legalization). A mere recommendation to consider issues related to climate adaptation would receive the weakest degree of obligation. In contrast, the firm commitments that use terms like ‘shall’ or ‘must’ denote a higher degree of obligation. We classified the degree of precision into four categories. General references, the weakest degree of precision, include the mere acknowledgment of the existence of the UNFCCC. The most precise provisions are those that provide for a specific target, such as the commitment to ratify a given MEA before a certain date. To assess the degree of delegation, we checked whether PTAs that include at least one climate change provision also provide for a judicial mechanism to settle disputes on that provision. We looked more specifically for an independent and accessible court or arbitration mechanism, with an automatic right to action that renders legally binding and enforceable decisions. We coded each dimension from 0 (the least legalized) to 1 (the most legalized). When PTAs included several provisions on climate change, we considered only the highest value reached by any provisions of the agreement, so that we do not penalize wordy agreements with long preambles.

Table 4 presents the results of our analysis. We find that several climate change provisions have a legally binding language. Of all PTAs with climate-related provisions, 64% have at least one provision that is highly legalized as measured through degree of obligation.

These climate provisions are rarely precise, however, with only 10% denoting specific targets. Further reflecting low levels of precision, more than 38% of PTAs with climate provisions merely acknowledge the climate change problem. For example, the clause stating that ‘The Parties shall develop and strengthen their cooperation to combat climate change’ (E.U. Georgia 2014, art. 307) scores high in obligation, because states that Parties *shall* do this, but low in precision, because the reference is vague and lacks a specific target or measure.

Finally, the level of delegation is very low. Seventy percent of PTAs with climate-related provisions do not provide for a third party to settle disputes on these provisions. For those that have such mechanisms, few provide for sanctions or remedies in case of violation. For example, the China–Korea agreement (2015) only authorizes parties to request for consultations if an environmental dispute arises (art. 16.8 and 16.9). As reflected in many

**Table 4.** Legalization of PTAs climate provisions.

	Median	Mode
Obligation	Binding commitment	Binding commitment
Precision	Discretionary measures	General reference
Delegation	No dispute settlement mechanism	No dispute settlement mechanism

PTAs, there is a double standard, with stronger enforcement mechanisms for trade commitments than for environmental ones.

Although the level of legalization is low across two of our three metrics, it has increased significantly since the 1990s. In the 1990s, the few agreements that included climate change provisions used language that was highly imprecise and poorly enforceable. For instance, the 1992 Framework Agreement on Enhancing Association of Southeast Asian Nation Economic Cooperation has merely a vague clause calling on Parties to cooperate on energy efficiency (art. 2(B) (3)). In the beginning of the twenty-first century, PTA provisions on climate change became more precise. A note to the 2011 agreement between Korea and US, for example, is particularly precise in providing that

from 2012 through 2015, a manufacturer that sold up to 4500 motor vehicles in the territory of Korea in calendar year 2009 shall be deemed to comply with the target level set forth in the regulations if either the average fuel economy or the average CO<sub>2</sub> emissions level for the vehicles the manufacturer sold in the territory of Korea during the relevant calendar year meets a target level that is 19 percent more lenient than the relevant target level provided in the regulation that would otherwise be applicable to that manufacturer.

We also see variation across countries in the level of legalization reflected in their PTAs. European agreements are characterized by a higher degree of legalization than average. They are highly binding and moderately precise (Douma 2017). However, they favor dispute settlement by consultation (although arbitration is also available in some recent agreements). In contrast, especially in recent agreements, the US tends to include dispute settlement mechanisms that include legally binding decisions and sanction-based enforcement provisions. The US, therefore, scores higher than the EU for delegation, due to the strong dispute settlement mechanisms (Jinnah and Morgera 2013). However, US agreements contain a significantly weaker level of obligation and precision in their climate change provisions than do those of the EU. There appears to be a trade-off between these provisions, as states rarely score high on all dimensions.

To summarize, the degree of legalization of climate provisions in PTAs varies across our three metrics. Although most agreements have at least one provision that scores high on obligation, the majority of climate provisions lack high levels of both precision and delegation. Different countries also favor different forms of legalization. Whereas the EU favors higher levels of precision and obligation in its PTA climate provisions, the US is weaker on those metrics but higher on delegation. Overall, this suggests that the level of legalization of PTAs' climate provisions is relatively weak, but as we note above, getting stronger over time.

## Replication

Most PTAs' environmental provisions are not tailored for a specific trade partnership. Rather, they are reproduced from their earlier agreements *verbatim* (or nearly so), and sometimes from third-country agreements (Allee and Elsig 2016). We refer to this process as 'replication.' In this section, we examine the extent to which climate-related provisions were replicated, which is important in evaluating PTAs' contribution to climate governance because it indicates how widely adopted a particular governance innovation has become.

Of the 688 PTAs we examined, 86% include at least one provision relating to the environment. Of these PTAs (or 222 agreements), 32% include at least one provision addressing a specific environmental issue, such as biodiversity, desertification, hazardous waste, forestry, or ozone depletion. However, only 14% of PTAs (or 98 agreements) have incorporated provisions that address issues related to climate change.

Although climate change provisions have recently become more common in PTAs, replication of these provisions within the trade system remains limited. As Figure 1 shows, the number of agreements that contain at least one climate-related provision remains significantly lower than the number of agreements with at least one provision related to other environmental issue-areas. Only 52% of all PTAs signed between 2010 and 2015 include a provision on climate change. These results highlight that, although several countries are increasingly willing to include detailed environmental provisions in their PTAs, some still avoid addressing climate change directly.

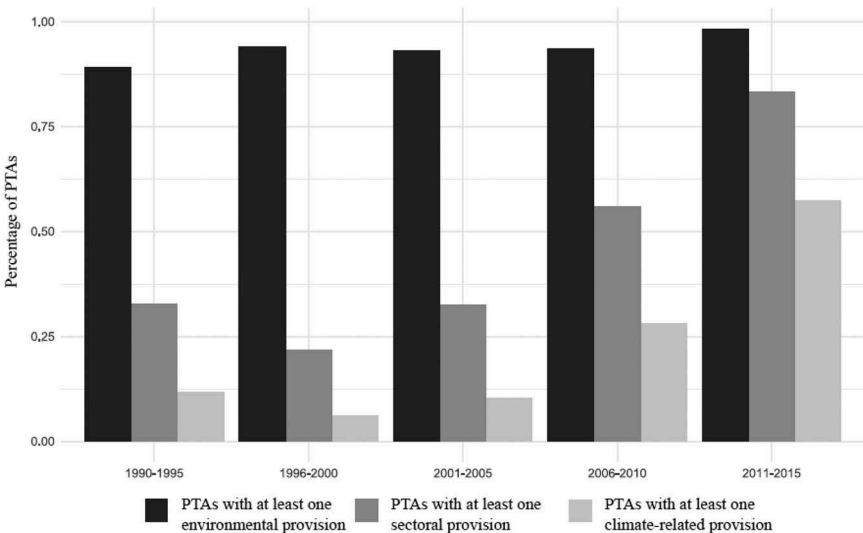
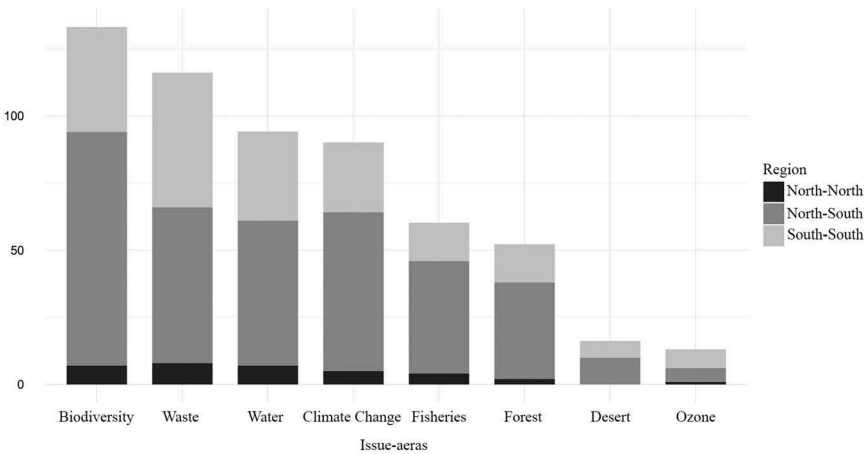


Figure 1. Share of PTAs with climate provisions.

In order to better assess the replication of climate change provisions within the trade regime, we compare PTA provisions on climate with those on biodiversity. The climate change and biodiversity regimes share a number of important features allowing for their comparison: they are two prominent global environmental regimes, with significant environmental, social and economic implications; both regimes have wide scope and cover several more specific issues, as evidenced by the proliferation of transnational and international instruments addressing these issues; the core treaties of regimes, the UNFCCC and the Convention on Biological Diversity (CBD) were both adopted in 1992; North/South politics structure central normative debates in both regimes; the US has opposed some key instruments of both regimes; both are trade-related but not trade-focused. Based on these similarities, we might expect that roughly as many PTAs would refer to climate change as to biodiversity.

Despite these similarities, our dataset reveals that far fewer PTAs address climate change than biodiversity (Figure 2).<sup>5</sup> Moreover, the gap between the number of provisions on climate change and those on biodiversity grows over time. Between 1990 and 1995, 11.7% included at least one climate change provision while 17.5% of agreements included at least one biodiversity provision. More recently, between 2010 and 2015, the percentage of agreements that include at least one climate change provision reached 54.8%. For the same period, 74.2% of PTAs include at least one provision on biodiversity. Despite a remarkable rate of replication for environmental provisions across the trade regime, the scope of replication for climate provisions remains smaller than that of biodiversity provisions.

In order to evaluate the replication of climate provisions relative to other environmental issues, we also compared the frequency of references to MEAs in



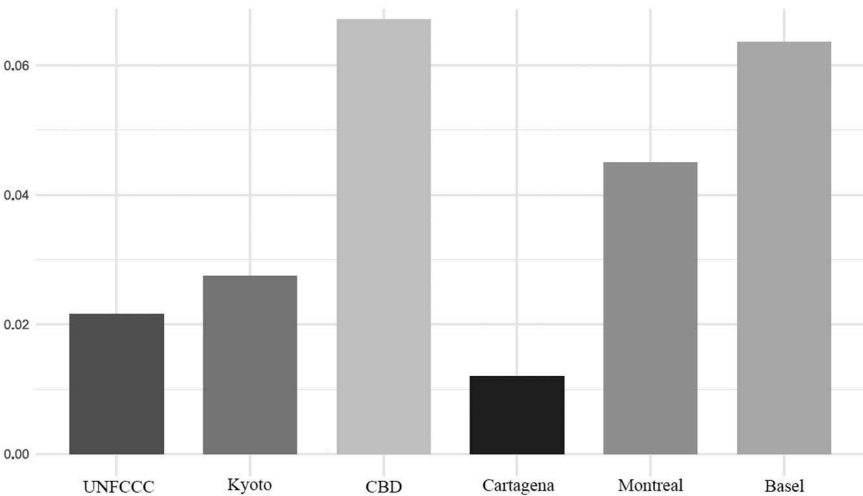
**Figure 2.** Number of PTAs with at least one provision addressing the issue area.

PTAs across issue areas. PTAs refer to MEAs for various reasons, including requiring parties to ratify or implement the MEA, as [Table 1](#) noted. In addition to the UNFCCC and the Kyoto Protocol, we look at the Vienna Convention (1981) and its Montreal Protocol (1987), the Convention on Biological Diversity (1992) and its two protocols (Cartagena, 2000 and Nagoya, 2010), and the Basel Convention on hazardous wastes (1989). For each MEA, we calculated the percentage of PTAs that refer to it since its conclusion. This means that older agreements are evaluated on the basis of a larger sample of PTAs. The results are presented in [Figure 3](#), where the UNFCCC and the Kyoto Protocol are clearly underrepresented in comparison to other MEAs. Less than 3% of PTAs adopted since 1992 (UNFCCC) or 1997 (Kyoto) refer to these climate agreements. By contrast, the CBD and the Basel Convention are referenced in more than 6% of all agreements signed after their adoption. With the exception of the sparsely diffused Cartagena Protocol, the two climate change agreements are lagging behind other MEAs in terms of the extent to which related provisions are replicated across multiple PTAs.

We have demonstrated that climate-related provisions are among the least replicated of all environmental provisions in PTAs. We support this finding by evaluating both the raw number of PTAs that reference climate relative to other environmental issues, and the number of PTAs that reference climate MEAs relative to MEAs in other issue areas.

### Distribution

The *distribution* of PTAs' climate change provisions is also important to consider: it is more important that states critical to the success of the



**Figure 3.** Proportion of PTAs with references to specific MEAs.



climate regime (i.e. the largest emitters) sign PTAs with climate provisions than it is how many PTAs in total have included climate provisions. Indeed, one argument for including climate provisions in PTAs is precisely that climate leaders can use their trade leverage to convince laggard or ambivalent countries. Unfortunately, we find that it is rarely the case.

The distribution of climate change provisions remains concentrated around Europe. The EU was the first to explicitly use the term ‘climate change’ in a PTA, with its agreements with Hungary and Poland on 16 December 1991, before the UNFCCC was even concluded. Moreover, until 2004, the EU was alone in explicitly referring to climate change in its PTAs.<sup>6</sup> Today, 38% of all European PTAs address climate change, and 100% of EU PTAs signed since 2008 contain climate provisions. The 50 or so EU trade agreements concluded since the adoption of the UNFCCC in 1992 contain an average of 2.6 climate provisions, and many of the most recent EU agreements contain more than seven such provisions. By comparison, PTAs signed throughout the world since 1992, excluding European agreements, have an average of 0.2 provisions on climate change.<sup>7</sup>

Figure 4 shows EU leadership on climate change governance through trade agreements in comparison to other major emitters, including the US and Japan. Not only does the EU more frequently include climate provisions in its PTAs, but it also includes a wider variety of climate provisions. Figure 4 also shows that many PTAs only address climate change indirectly. For example, although the EU and Japan have ratified both the UNFCCC

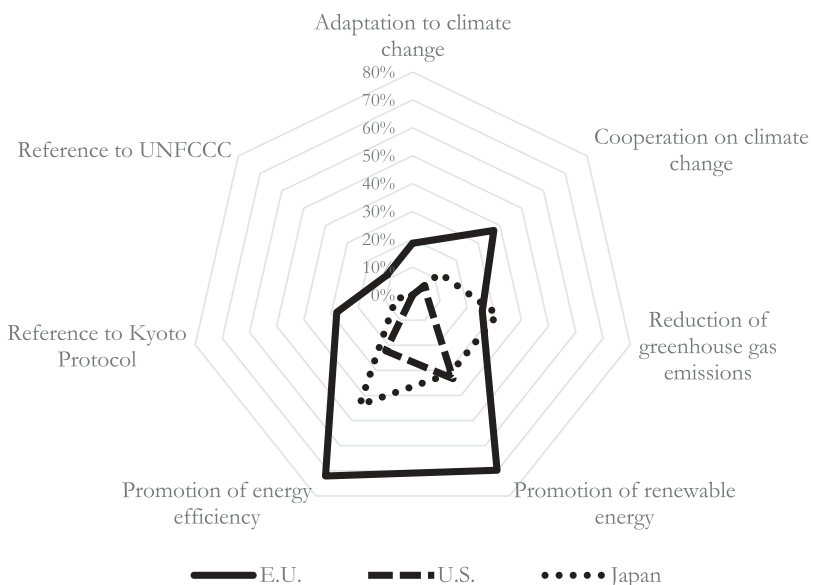


Figure 4. Percentage of PTAs that include provisions on climate change since 1992.

and the Kyoto Protocol, few of their PTAs refer to these two conventions directly. Rather, their climate provisions reflect broader policy objectives, such as promoting more efficient or renewable sources of energy.

We also conducted a network analysis to determine the distribution of climate provisions across countries. Figure 5 presents a chronological mapping of the network of PTAs that include at least one climate provision. Each node corresponds to a country or regional group and each tie shows that these two actors are linked by an agreement that includes at least one climate provision. As Figure 5 shows, the EU's central position clearly emerges from the constellation of agreements it has established with its trading partners. The network grew mainly around European influence and remains focused around the EU. That is, the EU is the most central actor, whether measured by degree

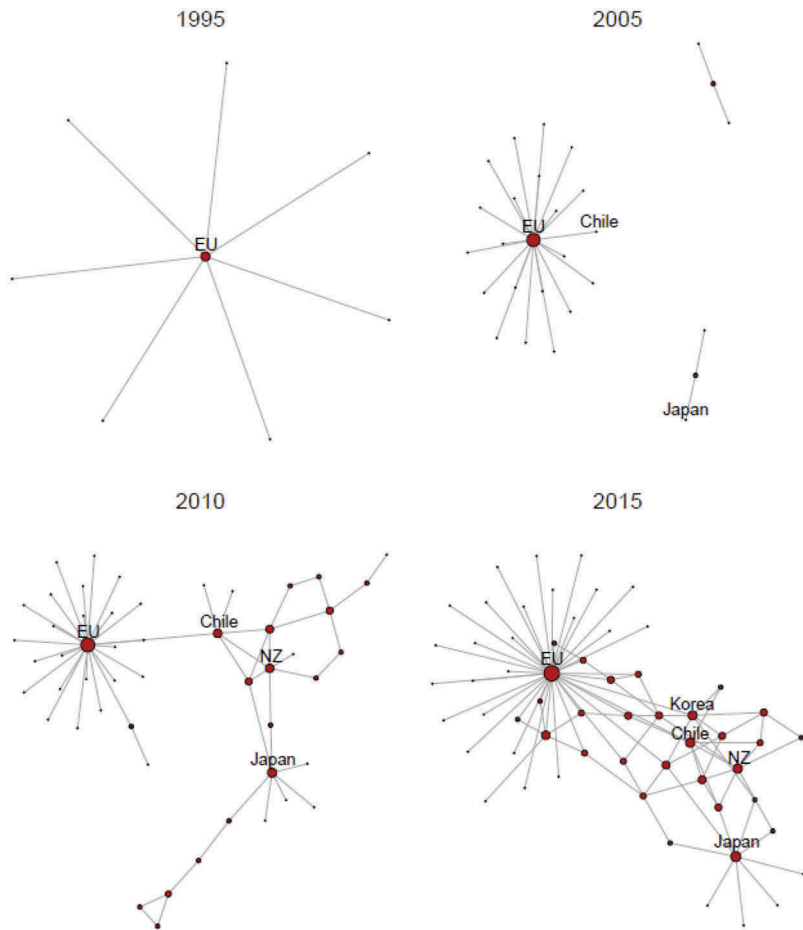


Figure 5. Network of provisions on climate change.

centrality, closeness centrality, or betweenness centrality.<sup>8</sup> We also see that the EU is struggling to export its model beyond its immediate trading partners. Only a small section of the network seems to have developed independently of EU influence. A number of Pacific Basin countries, in particular, have played a role in the dissemination of climate provisions, and some of their respective partners have gone on to reproduce these provisions in their subsequent agreements. Nevertheless their influence remains marginal compared with the E.U.

Unfortunately, many other major actors within the climate regime have not followed the EU's lead. Nearly 50 countries have not addressed climate change in any of their PTAs. Among these countries are some of the most significant GHG emitters and oil producers, such as Saudi Arabia, Brazil, Venezuela, and Iran.

Additionally, several major emitters only incorporate weak and few climate change provisions into their PTAs. Neither the US, India, China, nor Canada include a significant number of climate change provisions in their PTAs signed since 1992 (their respective averages of 0.6, 0.3, 0.4, and 0.8 compare to the EU's 2.6). The US includes a number of climate-related provisions in its recent PTAs (especially on renewable energy and energy efficiency), but explicitly refers to climate change only once, in the 2004 US-Australia Environmental side-agreement. That provision lists 12 specific environmental issues for cooperation between the US and Australia, with 'global climate change' among them. This is in stark contrast to the attention the US pays within its PTAs to other environmental issues, such as forest protection and endangered species (Jinnah 2011).

To further assess the distribution of climate provisions in PTAs, we compared the average number of climate change provisions in each country's PTAs with their level of CO<sub>2</sub> emissions.<sup>9</sup> The size of the bubbles in Figure 6 corresponds to the number of PTAs signed by each country. As such, smaller bubbles deserve less attention and should be interpreted with more caution than the larger ones. This analysis reveals that countries that include more climate provisions in their PTAs tend to be low emitters. Moreover, this relation is more significant for developed countries than for developing ones, with most developed countries seeming to design PTAs that reflect only their short-term economic interests regarding climate change.

The relationship between climate provisions and vulnerability is slightly more straightforward<sup>10</sup>: highly vulnerable countries are more likely to include climate provisions in their PTAs. The country with the most climate change provisions in its PTAs (see Figure 7), Eritrea, is also the second most vulnerable country (after Somalia). Conversely, countries with the lowest vulnerability indices, such as Norway, the US, and Canada, include fewer climate provisions in their PTAs. The EU appears as an

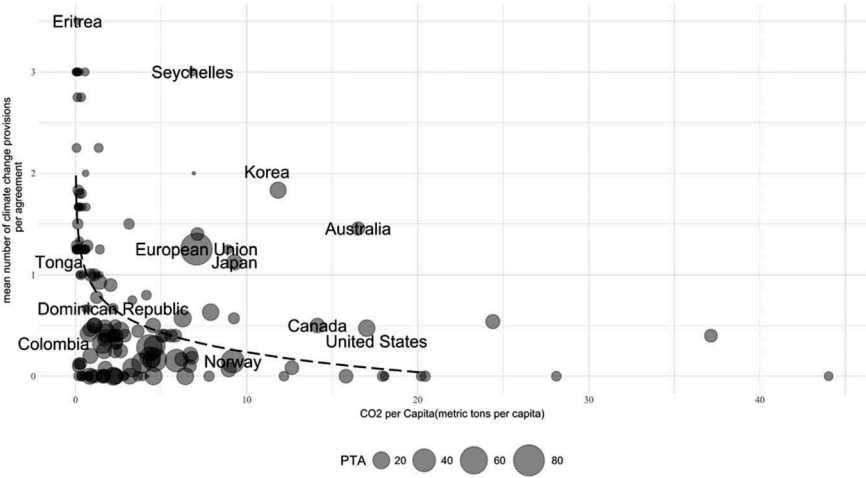


Figure 6. Relation between CO2 emission and PTAs' climate provisions.

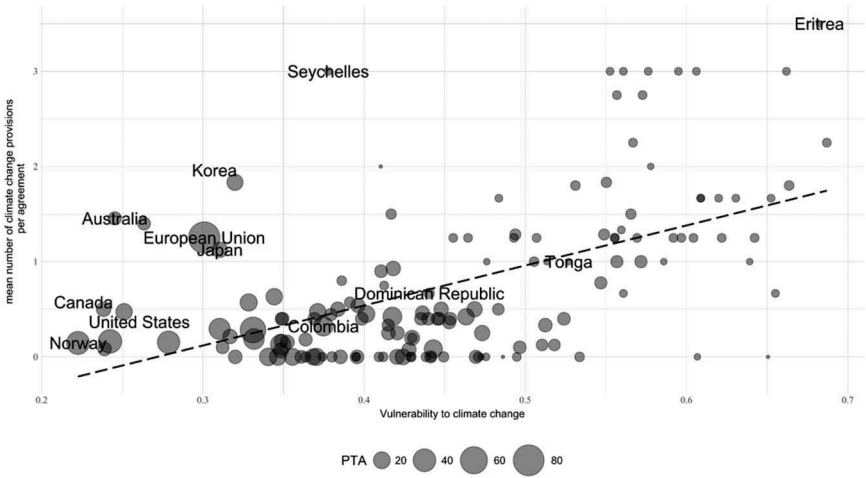


Figure 7. Relation between vulnerability to climate change and PTAs' climate provisions.

outlier, as it is less vulnerable to climate change while being one of the strongest proponents of mitigation in its PTAs.

This section has demonstrated the limited distribution of climate change provisions in PTAs. Although the EU is a clear leader on climate governance through PTAs, other major emitters are laggards, including only few and weak climate-related provisions. Finally, vulnerable countries tend to incorporate more climate provisions than do countries less vulnerable to climate change.

## Discussion and conclusions

With fewer parties at the bargaining table, supported by strong enforcement mechanisms, and allowing for policy experimentation, PTAs hold great potential to enhance climate change governance. We have assessed the actual regulatory contribution of PTAs to global climate change governance by examining the quality and quantity of climate change provisions across 688 PTAs. Centrally, we have argued that, although the inclusion of climate provisions in PTAs is novel, climate provisions in PTAs are weak on the other three metrics we measured: legalization, replication, and distribution. The legalization of climate provisions is weak due to their lack of precision and weak dispute settlement mechanisms. Replication of climate provisions is also limited in comparison to other environmental issues. Finally, with the exception of the EU, distribution is also weak, with limited uptake among large GHG emitters and among countries that are not highly vulnerable to climate change.

It is striking that PTAs ignore several issues at the very heart of trade–climate linkages: few PTAs include meaningful provisions on carbon taxes, fossil fuel subsidies, carbon credits, or emission trading. The mentions of carbon trading that do exist are limited to weak references to cooperation on this issue, for example in recent EU agreements with Moldova (2014, art. 93) and Georgia (2014, art. 308). The 2014 EU–Singapore agreement is the only trade agreement to address fossil fuel subsidies and it merely provides that ‘parties share the goal of progressively reducing subsidies for fossil fuels’ (art. 12.7). This points to the fact that PTA climate-related provisions are not particularly trade-related.

Taken together, these results raise important questions about how and why variation occurs and what leads to the emergence and persistence of particular types of provisions. Based on the proliferating provisions related to other environmental issues in PTAs, it is surprising that they have not been more fully explored as an avenue for climate governance. There are many possible reasons for this hesitancy. Arguably, countries are resistant to including strong climate provisions in PTAs for the same reasons they are resistant to accepting them in other multilateral forums: the costs of GHG mitigation are high and largely born by powerful actors in rich countries. This is in stark contrast to environmental issues, such as biodiversity, which have been quickly adopted in many PTAs. In that case, the costs of conservation are largely born poorer countries, which have the most biodiversity. It is possible that for biodiversity-rich countries, the benefits of market access outweigh the costs of conservation. Because trade negotiations tend to value utility in short-term economic gains, it is unlikely that the costs of climate mitigation would meet this bar.

As emerging economies move into more leadership roles on climate change, it will be very interesting to see if and how they incorporate climate issues into their future PTAs. Even Canada, a high-emitter, recently stated that it wants its trade agreements to ‘fully support efforts to address climate change’ (Freeland 2017). In this context, PTA provisions that create linkages to energy issues are likely to increase in future. As Lewis noted, increasing concerns about climate change mitigation costs have prompted states to promote renewable energy and energy efficiency through subsidies or other protectionist measures: ‘as renewable energy deployment expands, conflicts between renewable energy policy and trade policy are likely to escalate’ (2014, p. 27). PTAs may have a key role to play in managing these potential conflicts.

This raises questions about *if* PTAs are the appropriate venues to pursue environmental objectives at all, and if they are, *why* trade negotiators should care about these issues. If we are to ensure equity and legitimacy of global environmental governance, power dynamics must be carefully considered to ensure less powerful countries are not ‘muscle’ into accepting environmental provisions that may not be in their best interest as a condition of the market access granted by PTAs. But assuming these power asymmetries can be navigated, trade negotiators would be well advised to consider climate change. The era of siloed global governance is over. The scale and scope of contemporary global problems, coupled with the decrease in available resources to address these problems, demands that cooperation and interlinkages between problem-solving regimes be exploited. Regulating use of carbon taxes and facilitating tariff reductions on energy efficient technologies are obvious places to begin. Indeed, both the North American Free Trade Agreement (NAFTA) and the WTO have already begun to engage some of these issues, through for example, cooperation on adaptation planning and sectoral emission reductions under NAFTA (CEC 2015), and the WTO’s ongoing negotiations on the Environmental Goods Agreement. Trade negotiators for other PTAs would be wise to build on the work of NAFTA and the WTO as the interdependence of global problem solving continues to grow.

## Notes

1. Other concepts that describe this architectural form in climate governance include the regime complex (Keohane and Victor 2011) and fragmented governance (van Asselt and Zelli 2014).
2. There is great variation across PTAs in this regard. (Marx *et al.* 2017). However, the fact that recent US agreements include environmental provisions under the general dispute settlement suggests the potential for broader replication of such provisions to other PTAs. In contrast, the Paris Agreement and Kyoto Protocol both defer to the UNFCCC Article 14 for

resolution of any disputes. This article 14 is largely limited to conciliation, and in some limited circumstances, deferment to the International Court of Justice.

3. Given the nature of climate provisions in PTAs to date it is challenging to evaluate GHG reductions associated with these provisions (Baghdadi *et al.* 2013).
4. Our analysis assesses agreements signed before 31 December 2016. It does not include the EU–Japan trade agreement, which is the first trade agreement to specifically refer to the Paris Agreement.
5. For this comparison, we consider that the eight categories of provisions presented in Table 1 are climate changes provisions. We considered as biodiversity provisions those related to endangered species, invasive species, migratory species, protected areas, genetic resources, biosafety and genetically modified organisms.
6. We looked for various translations of ‘climate change’ and ‘global warning’.
7. Although some African countries appear to include a relatively high average number of provisions on climate change in their trade agreements, this is largely explained by the fact that they have signed fewer agreements more recently than other countries.
8. Degree centrality is based on the number of ties per node. Closeness centrality measures, for each node, the distance to all other nodes. Betweenness centrality is based on the location of a node in the path that link other nodes. As a central actor, the EU has the highest number of PTAs with at least one climate provision (degree centrality), is connected to other countries in this network by the fewest number of PTAs (closeness centrality), and appears as a step in most paths connecting two other actors in this PTA network (betweenness centrality).
9. We used 2011 CO<sub>2</sub> emissions per capita provided by the World Bank.
10. We evaluated vulnerability of a country to climate change according to the *Notre-Dame Global Adaptation Index*.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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