

Interconnections between the 2030 Agenda and the Paris Climate Agreement – Putting the Spotlight on Trade Elements in the NDCs

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1. INTRODUCTION

In December 2015, all members of the United Nations adopted the Paris Agreement at the 21st Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) and demonstrated the global commitment to hold the increase in global average temperature to “well below 2°C” compared to pre-industrial levels and to “pursue efforts” to limit the increase to 1.5°C. In this context, they agreed to achieve net zero emissions in the second half of this century.

The Paris Agreement is built on a bottom-up approach, meaning that countries are free to determine their own climate targets and instruments, expressed in nationally determined contributions (NDCs). Since countries set out their climate actions before the Paris Agreement was adopted, the word “intended” was used for their national climate action commitments. Once a country ratifies the Paris Agreement, its intended nationally determined contribution (INDC) is converted into an NDC. Many countries have already formally joined the Paris Agreement and converted their INDCs to NDCs.² In future, under the provisions of the Paris Agreement, countries will be asked to submit an updated NDC every five years, and it will have to be more ambitious than the country’s previous NDC (ratcheting-up mechanism).

In October 2016, the relevant ratification conditions were fulfilled and the Paris Agreement entered into force on 4 November 2016. Having celebrated its adoption and speedy ratification as a historical step, the world must now move on to implementing the new treaty and the NDCs it entails. In light of the enormous environmental, economic and social risks that climate change generates, there is a need to assess the role of trade in relation to the implementation of NDCs and the Paris Agreement in order to promote more coherent policymaking and harness international trade approaches that encourage and support the transformation to a low-carbon economy and sustainable development and the 2030 Agenda more broadly.

International trade flows are central for fostering the availability of climate-friendly technologies and of products with relatively lower levels of embedded carbon at competitive costs and at larger scale. A huge shift to climate-friendly technologies is essential to reach the

¹ A similar version of this paper has been published by ICTSD: <http://www.ictsd.org/themes/climate-and-energy/research/trade-elements-in-countries%E2%80%99-climate-contributions-under-the>.

² See the UNFCCC NDC Registry. In referring to the climate contributions under the Paris Agreement in general, the term “NDC” is used; for individual countries’ contributions, either “NDC” or “INDC” is used depending on whether or not that country has ratified the Paris Agreement.

objectives of the Paris Agreement. However, a number of trade barriers undermine their diffusion and deployment. The liberalisation of international trade can thus significantly stimulate the development of this market and increase the spread and affordability of, for instance, clean energy or energy efficiency technologies. In particular, the reduction of trade barriers for environmental goods and services can contribute to climate change goals by facilitating the switch to renewable energy, as well as in improving energy efficiency and thus reducing fossil fuel usage. Moreover, climate-related provisions in trade agreements can act as stimulating framework conditions for decarbonising economic activities. Trade can also help compensate for or adjust to altered productive capacities caused by climate change, for example to ensure access to food or to support economic diversification.

At the same time, the novel bottom-up approach to climate governance, leading to a range of different climate policies and numerous levels of national ambition enshrined in the NDCs, will have manifold trade-related implications. While the Paris Agreement does not explicitly mention international trade, it will affect international trade flows, produce positive and negative spillover effects on other countries through trade, and can be expected to generate more trade conflicts, probing the boundaries of trade rules. Moreover, varying levels of ambition of the NDCs are likely to increase concerns about competitiveness and carbon leakage, which may stimulate the implementation of contested responses and contentious trade-related measures.³ On the other hand, cooperation on climate measures, which can be supported by the global trade regime, can help to better align national measures and cut back trade-related concerns. The Paris Agreement thus increases interactions with international trade and the trade regime, including bilateral, regional and plurilateral trade agreements, and the need for international cooperation to foster synergies between trade and climate policies (Dröge et al. 2016) – and the goals of the 2030 Agenda for Sustainable Development more broadly.

It is therefore important to assess the details of the potential interactions between climate and trade in the context of the Paris Agreement. For instance, trade concerns should not unnecessarily undercut climate objectives and, at the same time, climate change mitigation should not be used as an excuse for unjustifiably protectionist trade measures. The growing interactions therefore have to be taken into account to ensure that the capacity of trade to support climate action is realised and that trade does not undermine climate goals. Considering the linkages can foster more coherent international cooperation and policymaking, with positive implications for both trade and climate change, and ultimately for sustainable development—which is essential in light of the global commitment to the 2030 Agenda and the 17 Sustainable Development Goals it enshrines. In this context, there is also a need to assess and reflect on the implications of measures taken to combat climate change, so-called response measures, in order to ensure that climate action fosters sustainable development.

While there is a growing literature on overlapping regimes (Keohane and Victor 2011; Zelli, Gupta and van Asselt 2013) and a number of studies of the role of international trade or the trade regime in light of the Paris Agreement (Bacchus 2016; Cosby 2016; Dröge et al. 2016;

³ At the same time, the universality of the Paris Agreement addresses to some extent these concerns compared to the previous system of distinguishing between Annex I (industrialised) and non-Annex I (developing) countries.

Granoff 2016; Jegou, Hawkins and Botwright 2016; Saner 2016; Sierra Club 2016; Working Group on Trade, Investment, and Climate Policy 2016), there has so far not been a detailed analysis of the role of trade in the NDCs and an assessment of the post-Paris climate change regime and its interplay with the trade regime complex through the NDC-lens.⁴ Against this background, the objective of this paper is to analyse the NDCs from a trade perspective, exploring how trade frameworks can support their efforts and identifying ways to minimise potential conflicts and instead create a mutually reinforcing relationship between the trade and the climate regimes—putting the spotlight on climate change mitigation. The trade elements in countries’ climate contributions are discussed and options identified for strengthening the mutual supportiveness of the two regimes. The main purpose is to explore how trade and trade measures can help to promote the implementation of NDCs.

2. TRADE AND CLIMATE CHANGE UNDER THE PARIS AGREEMENT

In the context of the Paris Agreement, the climate regime has moved towards a universal approach, which demands efforts from all countries. This, together with the commitment to increase ambition over time, has the potential to generate the response to climate change that is needed to avoid the most dangerous levels of global warming. After its historic adoption, it is now crucial to make sure the Paris Agreement does not remain a paper tiger but is properly implemented, including in terms of the countries’ national contributions. Trade elements in the NDCs, as well as trade frameworks and the trade system more generally, have an important role to play in supporting the implementation of the Paris Agreement.

While the Paris Agreement is universal, it is characterised by a flexible bottom-up approach that leaves open which climate actions individual countries seek to implement. In the run-up to the Paris negotiations, countries publicly announced their post-2020 climate targets, or INDCs. The ambition of the climate targets and actions communicated in these INDCs, and the extent to which they are implemented, in principle decide whether or not the world achieves the Agreement’s long-term goals.

More than 160 INDCs have been submitted, of which more and more are being converted into NDCs.⁵ They mirror each country’s ambition to mitigate greenhouse gas emissions (GHG), taking into consideration its domestic circumstances and capabilities. Many countries also address other issues in the climate contributions, such as what support they need from, or will provide to other countries (Pauw et al. 2016). In their climate action plans, countries thus communicate both their contributions and their conditionalities.

While the Paris Agreement provides for scaling up the global mitigation effort, it also increases interactions with international trade and the trade regime. On the one hand, national climate strategies can entail a number of measures that may be in conflict with the trade regime. At the

⁴ For a brief overview of policy measures with trade implications in the NDCs, see Dröge et al. (2016,30).

⁵ See <http://www4.unfccc.int/submissions/indc/Submission%20Pages/submissions.aspx> and <http://www4.unfccc.int/ndcregistry/pages/All.aspx>. The European Union (EU) contribution counts as one submission (comprising 28 EU member states). By March 2017, more than 120 INDCs had been converted into NDCs.

same time, various trade policies and trade-related measures can be supportive of the NDCs and can foster their achievement. Considering these linkages can lead to more coherent policymaking, with positive outcomes for both trade and climate change, and ultimately for sustainable development (Dröge et al. 2016; Jegou, Hawkins and Botwright 2016).

In the context of the UNFCCC's response measures forum, established in 2010 to reflect on the implications of what are called "response measures" to climate change, there have been attempts to generate a discussion about international trade.⁶ However, this has been difficult and contentious—not least due to the perception that the debate about response measures may be tied to "compensation obligations" towards countries whose exports would be negatively affected by climate measures, as well as the view that trade discussions belong purely to the World Trade Organization (WTO). With a shift of tone and focus in the response measures forum since the adoption of the Paris Agreement, focusing now more on the "sustainable transition," international trade may feature again in that context (Marcu and Stoefs 2017).

A deeper understanding and a more thorough reflection on the interactions between trade and climate change can help maximise the synergies between the two. To achieve this goal, we need to assess the key trade elements that are particularly relevant in creating opportunities and/or challenges for the climate and trade interface. In the following, 11 important trade elements will be discussed: reducing trade barriers, regulating trade on climate grounds, regulating timber trade, standards and labelling, border carbon adjustments, renewable energy, fossil fuel subsidy reform, international market mechanisms, technology transfer, response measures, and co-benefits.

2.1 Reducing Trade Barriers

Open international markets are important for making mitigation and adaptation technologies more available at lower cost and facilitating access to products with relatively lower levels of embedded carbon. A crucial contribution that trade can make to climate action is thus to foster the diffusion of climate-friendly technologies, such as clean energy or energy efficiency technologies, which are hampered by considerable trade barriers. There are different types of trade barriers. For example, we can distinguish between tariffs and non-tariff barriers. The latter include, for example, standards, conformity assessment procedures, local content requirements, and restrictions on trade in services. They are often even more problematic and require more cooperation than tariffs.

The reduction of trade barriers can also enhance the supply of intermediate goods needed for the introduction of climate-related technologies. Reducing trade barriers, including unilaterally, fuels the production, diffusion and deployment of these technologies and stimulates the development of the market for the renewable energy and energy-efficient technologies required for the transformation to a low-carbon economy. Access to the needed climate products is fostered and they are made more affordable, increasing their uptake. Overall, in 2012, the global market for low-carbon and environmental goods and services was estimated

⁶ The parties did not rule out actions that are contested from a trade perspective, such as border carbon adjustment or carbon standards and labelling.

at around US\$5.5 trillion—of which almost 80 percent was directly related to climate change (UK Department for Business, Innovation and Skills 2013)—amounting to more than one quarter of the dollar value of trade in that year.

2.2 Regulating Trade on Climate Grounds

While lowering trade barriers can foster the international flow of goods and services that facilitate climate protection, under certain circumstances, set out by international trade law, there is also an option to use trade barriers to regulate trade on environmental grounds: Non-discrimination, a core value of the multilateral trading system, is enshrined in GATT Article I (non-discrimination between countries, requiring “like” products from different countries to be treated equally) and GATT Article III (national treatment obligation, requiring imported products to be treated in the same way as “like” domestic products).

This may generate challenges for climate policies that seek to distinguish products based on their embodied emissions. Trade law allows countries to set criteria for the way goods are produced and to discriminate between different products in accordance with these criteria if the relevant process and production methods (PPMs) affect the “likeness” of products. In the absence of a single definition of “likeness,” the judgement is made on a case-by-case basis, typically including criteria such as the physical characteristics of the final products or their competitive relationship to one another (Hawkins 2016). While emissions are part of the production process, they cannot be found in the physical characteristics of a traded good. Yet, there is disagreement about the permissibility of discriminatory measures based on “non-product related PPMs” (npr-PPMs) that leave no trace in the final product (Low, Marceau and Reinaud 2011). Whether products can be considered “unlike” based on npr-PPMs is contested (Grubb et al. 2015). The trade system as it is today therefore does not straightforwardly distinguish between products based on their levels of embedded carbon (Grubb et al. 2015; Bacchus 2016; Hawkins 2016).

This legal uncertainty might be addressed by invoking General Agreement on Tariffs and Trade (GATT) Article XX. At the same time, the possibility of invoking Article XX with respect to PPMs which entail different carbon content of products raises some controversy and it remains to be seen how WTO jurisprudence will address the issue. GATT Article XX contains a list of exceptions to the GATT rules, allowing for the suspension of non-discrimination if certain conditions are met. For instance, Article XX allows derogation from GATT principles for national policy objectives, including environmental considerations where there is a proven risk of endangering “human, animal or plant life or health” in line with GATT Article XX(b) or where it is necessary for the protection of exhaustible natural resources in line with GATT Article XX(g). Proving this is a challenging undertaking, however. Moreover, to invoke GATT Article XX, a country would have to satisfy the chapeau, showing that the climate measure does not “constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade ...” Therefore, there is currently no legal certainty in the trade system for countries to administer climate measures that distinguish

products based on their embedded carbon, though a possibility remains and the understanding is still evolving.

In addition to the GATT, a set of other WTO agreements are relevant for the interactions between climate and trade policy, including the Agreement on Technical Barriers to Trade (TBT) which addresses regulatory measures in the context of trade in goods. Under the TBT Agreement, “a Member's right to regulate should not be constrained if the measures taken are necessary to fulfil certain legitimate policy objectives,” such as environmental protection. At the same time, it is contested whether the TBT Agreement also applies to npr-PPMs (see below).

2.3 Regulating Timber Trade

In light of the importance of deforestation as a driver of climate change, improving forest governance and promoting the international trade in legally sourced timber can contribute to mitigating climate change and reducing other environmental impacts of illegal logging. Regulating timber trade can thus help to strengthen climate protection by preventing deforestation and improving the protection of much-needed carbon sinks worldwide. Moreover, it can also help to increase the incomes and food security of forest communities by promoting access to domestic and international markets for wood. There are several prominent approaches in this context (EU FLEGT Facility 2012). The EU's FLEGT (Forest Law Enforcement, Governance and Trade) Action Plan, established in 2003, aims to reduce illegal logging by strengthening sustainable and legal forest management, improving governance and promoting trade in legally produced timber. In Australia, the Illegal Logging Prohibition Act 2012 prohibits the import of illegally logged timber and timber products into the country. In the United States in 2008, the Lacey Act, originally passed in 1900 to protect the trafficking of wildlife, was amended to include plant products, turning it into the world's first ban on the trade of illegally sourced wood products (EU FLEGT Facility 2012, 4).

2.4 Standards and Labelling

Measures that seek to regulate the embodied carbon of products may fall under the GATT (Article III on national treatment) and/or the TBT Agreement, which addresses specifically standard and labelling requirements applicable to “a product, process or production method.” Mandatory standards that determine product characteristics or related production methods, referred to as technical regulations under the TBT Agreement, are permitted, under certain conditions, if they are applied in an equal manner to domestic and imported products such that imports are not at a comparative disadvantage in comparison to the “like” domestic products (Assunção and Zhang 2002, Arcuri 2013). The crucial issue is therefore to determine whether two seemingly similar products with different amounts of embodied carbon could be considered “unlike.” However, whether products can be regarded as “unlike” based on npr-PPMs is controversial and measures which discriminate between products based on npr-PPMs, such as mandatory environmental standards or ecolabels, are thus also controversial (Grubb et al. 2015). While trade law thus sets limits for the use of mandatory standards, for the time being, voluntary standards are beyond the scope of WTO disciplines (Grubb et al. 2015).

The use of labelling for traded goods, for example on the basis of their embodied carbon, might become more relevant in light of the Paris Agreement (Cosbey 2016). While ecolabels such as product carbon footprint labels used to represent a small niche, more recently they have been growing in relevance, applying to an increasing market share (Potts et al. 2014). Standards and labels offer opportunities for strengthening climate protection, for example by fostering consumer awareness and more transparency along global value chains. They thus promote climate-friendly consumption and production patterns. They can also create market access opportunities for those with comparative advantages in this area. However, they also entail controversies. One key challenge is raised by the debate about the underlying methodologies for calculating the amount of a product's embedded carbon, which in turn would have considerable trade implications (Bolwig and Gibbon 2009; Neuhoff et al. 2014). An additional challenge relates to the costs involved for producers and market access implications, especially for smaller producers (Neuhoff et al. 2014; Brandi 2016).

2.5 Border Carbon Adjustments

Insofar as the ambition of climate contributions will increase over time under the Paris Agreement, countries will be ever more likely to worry about the implications of their policies for competitiveness. Concerns about carbon leakage can also be expected to increase. In the case of unilateral carbon pricing or emissions trading regulation, there is a risk that domestic demand shifts to cheaper products from abroad that may be subject to less stringent climate policies, causing production in other countries to increase and to generate more emissions, thereby offsetting domestic mitigation efforts.

In this context, border carbon adjustments will unarguably be considered as one potential policy option to address carbon leakage and competitiveness concerns (Dröge et al. 2016; Kortum and Weisbach 2016). Border carbon adjustments are a policy tool intended to respond to carbon pricing that differs across jurisdictions. They make sure that imported goods are also subject to the importing country's carbon cost by pricing imports and reimbursing the carbon cost for products destined for export. While border carbon adjustments are currently not implemented anywhere, they have surfaced again and again in several debates and policy proposals, also recently, and their introduction has been explored in both the EU and the United States.⁷

Border carbon adjustments are legally and politically controversial—and their climate-trade implications are not clear-cut. On the one hand, they can contribute to preventing carbon leakage, thus offering opportunities for climate protection. On the other hand, they entail risks, for instance in terms of being abused for protectionist purposes or generating conflict with the trade regime. Moreover, their implementation would involve practical and administrative challenges (Persson 2010). If they were to be introduced, their environmental objective would

⁷ The EU attempted to include international aviation in its emissions trading system, which was the closest attempt to date to introduce border carbon adjustments, and which caused a lot of backlash. Following the adoption of the Carbon Offset and Reduction Scheme for International Aviation by the International Civil Aviation Organization in October 2016, the EU will have to re-evaluate what to do with the suspension of this measure.

have to be made clear and taken into account in their design, and their misuse for protectionist purposes should be prevented (e.g. Cosbey et al. 2012).

2.6 Renewable Energy

Scaling up renewable energy is essential to mitigate climate change (IPCC 2015). Renewable energy therefore plays a highly important role in many countries' mitigation efforts. According to the global renewable energy roadmap from the International Renewable Energy Agency, the world can reduce global carbon emissions from energy use by as much as 35 percent if the share of renewable energy is doubled by 2030 (IRENA 2016). Subsidies for renewable energy are a key approach to support renewable energy development—and entail many important interlinkages with the trade regime. For instance, subsidies can help renewable energy firms in a dynamic new market tackle market failures and become globally competitive. However, they may also end up extending the life of companies that will never reach the point of competitiveness. Moreover, renewable energy subsidies may be conditional on local content requirements⁸ which undermine trade opportunities and thus cost-effective access to the components needed for renewable energy generation equipment, with implications for the costs and provision of renewable energy (Espa and Rolland 2015).

While GATT Articles VI and XVI include general provisions on subsidies, the WTO Agreement on Subsidies and Countervailing Measures (SCM) provides definitions of subsidies in order to regulate their use. National climate policies, especially those that strengthen renewable energy development, could be in conflict with international trade law if domestic producers are supported in a protectionist manner that undermines WTO rules.⁹ In the recent past, there have been many trade disputes in this area, and the increasing support for renewable energy can be expected to test the limits of existing trade rules and further increase the likelihood of trade disputes in that context (Dröge et al. 2016).¹⁰ A recent case is the *India – Solar Cells* feed-in tariff dispute (DS456). India asserted that its trade-restrictive domestic content requirement for solar panel producers was eligible for a specific subsidy scheme as part of its national climate action plan under the Paris Agreement, but this view was not supported by the WTO dispute settlement. Overall, the Paris Agreement can be expected to stimulate stronger competition in terms of support for renewable energy, which could potentially generate more trade disputes.

2.7 Fossil Fuel Subsidy Reform

Fossil fuel subsidies distort prices to the detriment of decarbonisation, inhibit the spread of climate-friendly technologies, and place a burden on national budgets. Due to the absence of clear reporting, there are various estimates. According to Koplou (2014), subsidies to energy amount to approximately 1 percent of global gross domestic product (GDP), or US\$840 billion—with some 70 percent going to oil (39 percent), natural gas (24 percent) and coal (6 percent).

⁸ On local content requirements, see Kuntze and Moerenhout (2013).

⁹ The link between energy and trade is complicated as energy can be regarded as both a good and a service and thus subject to various WTO rules, including those of the SCM Agreement.

¹⁰ More generally, we might also see more support for “low-carbon” firms or sectors, used as a tool of industrial policy (Cosbey 2016). On green industrial policy, see also Pegels (2014) and Rodrik (2014).

According to another recent study, the costs caused by these subsidies, including environmental and health damage, currently run to around US\$5.3 trillion per year (Coady et al. 2016).¹¹ At the same time, against the background of existing trade rules, fossil fuel subsidies cannot be challenged on account of their environmental externalities (Horlick and Clarke 2016). Additional issues of concern are that fossil fuel subsidies are often not reported by WTO members, in part due to unclear rules about which types need to be notified (Casier et al. 2014), and that subsidies to fossil fuels are hardly ever questioned under the surveillance mechanism of the WTO (Steenblik and Simón 2011; Casier et al. 2014).

2.8 International Market Mechanisms

The Paris Agreement has widened the scope for using market-based carbon pricing mechanisms on a voluntary basis, but has not specified their design and implementation. Article 6 of the Paris Agreement includes several provisions that allow for the use of international carbon markets, including voluntary cooperative approaches (Cames et al. 2016).¹² International cooperation in the context of carbon markets can contribute to reducing the cost of mitigation, as well as addressing competitiveness and carbon leakage concerns, which in turn can generate incentives to promote an increasing number of carbon markets with greater ambition (Hawkins 2016). Potential conflicts with trade rules could arise if national or international emissions trading schemes allow for free allocation or if they include importers (Dröge et al. 2016).

2.9 Technology Transfer

Relevant climate technologies are, for instance, those linked to mitigation efforts, such as energy efficiency, renewable energy or hybrid vehicles, but also adaptation technologies, such as those required for drought-resistant crop varieties or improved irrigation systems. While the need for technology transfer has been acknowledged in the Paris Agreement (Article 10), the climate treaty does not stipulate the details of how to transfer climate-friendly technologies or how the relevant questions regarding intellectual property rights (IPRs) should be addressed. Instead, it postpones the clarification of these issues, which are likely to be controversial, to future negotiations, above all in the context of the Paris Agreement and the WTO (Dröge et al. 2016).

The WTO matters for technology transfer because the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) is relevant for the role of IPRs in traded climate-friendly technologies. While the TRIPS Agreement entails some flexibility in the enforcement of IPRs, and requires, for instance, special treatment for least developed countries (LDCs) (Yu

¹¹ Contrary to popular opinion, subsidising fossil fuels is not an efficient way of increasing competitiveness and helping the poor. Instead, according to the World Bank these subsidies particularly benefit the better-off (Fay et al. 2015). However, although the removal of subsidies tends to promote equality, it leads to an increase in the price of energy and other goods, lowering the purchasing power of poorer households. It is therefore essential that the savings made by the removal of subsidies are used to compensate loss of income among the poor, reimburse people who lose out financially and strengthen social safety nets (Brandi et al. 2015).

¹² It is disputed whether internationally traded emissions unit fall under the GATT or the General Agreement on Trade in Services (GATS).

2016), the agreement does not clarify the underlying disagreement on IPRs in the context of innovation and diffusion of climate technologies. While many developed countries and the private sector argue that strong IPRs are required to promote the needed innovation of climate technologies, many developing countries and non-governmental organisations argue for using and expanding the flexibilities on intellectual property under the TRIPS Agreement, including compulsory licensing, to facilitate access to those technologies (UNEP, EPO and ICTSD 2010). However, in light of the many other important factors determining the success of technology transfer, including domestic ones, IPRs are often not the biggest hurdle to be overcome (UNEP, EPO and ICTSD 2010; de Coninck and Sagar 2015).

2.10 Response Measures

According to the Paris Agreement, consideration must be given to “the concern of Parties with economies most affected by the impacts of response measures” to climate change, above all developing countries which might be worried about their prospects for social and economic development (Chan 2016). During COP21, it was decided to continue and strengthen the response measures forum established earlier in order to facilitate debate of this issue, which has traditionally been challenging because of its sensitive and controversial nature, including the perception that it serves the interest of oil-exporting countries and may raise obligations of compensation (Jegou, Hawkins and Botwright 2016).

Response measures are relevant to international trade in the following two ways: On the one hand, climate policies can affect trade flows; on the other hand, trade measures can be harnessed to foster the mitigation of climate change (ICTSD 2011b). According to Article 3.5 of the UNFCCC, “measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade.” It is thus important to assess and work together to minimise inadvertent implications of response measures, including for international trade, and also to make sure that climate action enhances, rather than undercuts sustainable development (Jegou, Hawkins and Botwright 2016).

2.11 Co-benefits in the Context of Trade

Trade and trade-related elements in the context of the NDCs can generate co-benefits. For instance, the scaling up of renewable energy can stimulate exports of renewable energy and lower dependency on imports of costly fossil fuels. This can foster energy security and free up financial means in the public budget for other key issues such as health or education, potentially generating additional sustainable development co-benefits in relation to Agenda 2030.¹³

¹³ Other potential co-benefits relate to the creation of jobs and economic diversification. At the same time, the consequences of trade-related mitigation efforts are not clear-cut and while the relationship between trade and mitigation is likely to create many co-benefits, it can also generate trade-offs in terms of economic diversification. See also Elkahwagy, Gyanchandani and Piselli (2017).

3. METHODOLOGY

This section assesses first the occurrence of a number of trade-related elements across all NDCs. In a second step, it will turn the spotlight on 22 selected NDCs: Australia, Brazil, Canada, Chile, China, Democratic Republic of the Congo, European Union, India, Indonesia, Iran, Japan, Mexico, Maldives, Morocco, New Zealand, Norway, Saudi Arabia, South Africa, South Korea, Trinidad and Tobago, Russia, and the United States.

These NDCs have been chosen on the basis of a number of objective criteria. First of all, the selection is based on whether the country is among the major emitting countries. All of the 10 most important emitting countries in terms of total territorial emissions are included in the analysis: China, the United States, India, Russia, Japan, Germany (as part of the EU), Iran, South Korea, Saudi Arabia and Brazil (see Table 1). Moreover, three of the 10 most important emitting countries in terms of territorial emissions per capita have been selected: Trinidad and Tobago, Saudi Arabia and Luxembourg (as part of the EU) (see Table 2). Moreover, the selection also takes account of whether the country is a key net exporter of embedded carbon. The more closely analysed sample includes the four most important net exporters of carbon (China, Russia, India, and South Korea) plus an additional three (South Africa, Saudi Arabia, and the Netherlands as part of EU) out of the top 10 net exporters of embedded carbon (see Table 3).

Table 1: Top 10 emission countries (total)

(countries in the sample are highlighted in bold)

	CO ₂ (kt) (2013)	CO ₂ (metric tons per capita) (2013)
1. China	10,249,463	7.6
2. United States	5,186,168	16.4
3. India	2,034,752	1.6
4. Russia	1,789,074	12.5
5. Japan	1,243,384	9.8
6. Germany	757,313	9.2
7. Iran	616,976	8.0
8. South Korea	592,499	11.8
9. Saudi Arabia	541,429	17.9
10. Brazil	503,677	2.5

Source: World Bank (http://data.worldbank.org/indicator/EN.ATM.CO2E.PC?name_desc=false)

Table 2: Top 10 emission countries (per capita)

(countries in the sample are highlighted in bold)

	CO ₂ metric tons per capita 2013
1. Qatar	40.5
2. Trinidad & Tobago	34.5
3. Curaçao	34.2
4. Kuwait	27.3
5. Bahrain	23.7
6. Sint Maarten (Dutch Part)	20.8
7. Brunei Darussalam	18.9

8. United Arab Emirates	18.7
9. Luxembourg (part of EU)	18.7
10. Saudi Arabia	17.9

Source: World Bank (http://data.worldbank.org/indicator/EN.ATM.CO2E.PC?name_desc=false)

Table 3: Top 10 net exporters of embedded carbon

(countries in the sample are highlighted in bold)

	(net-CO ₂ million t)
	2011
1. China	995.7
2. Russia	531.8
3. India	134.5
4. South Korea	61.6
5. Chinese Taipei	59.1
6. South Africa	45.6
7. Saudi Arabia	41.9
8. Malaysia	39.1
9. Netherlands (part of EU)	17.20
10. Thailand	15.70

Source: Wiebke and Yamano (2016)

4. TRADE ELEMENTS IN THE CLIMATE CONTRIBUTIONS

What kinds of trade elements are incorporated into the NDCs, to what extent do the different trade elements feature in the NDCs, and which potential or pitfalls do they imply? This section identifies and describes the NDCs' trade elements and also outlines their implications, identifying potential opportunities or conflicts.

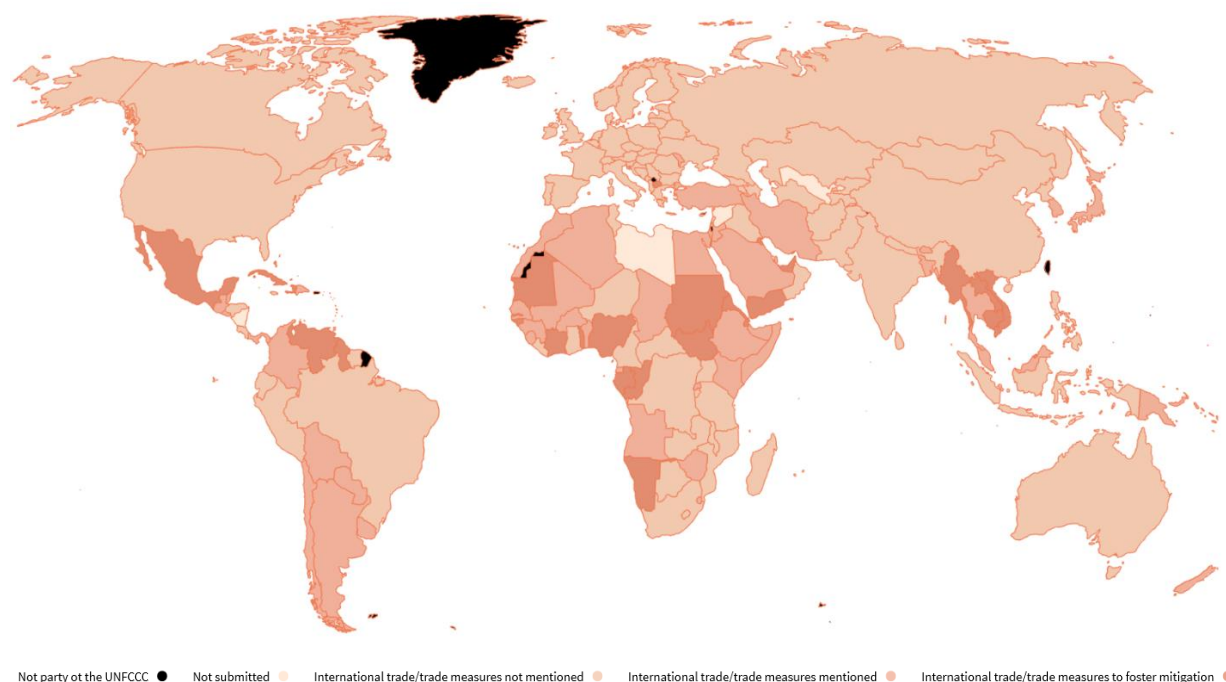
4.1 Trade Elements in the Climate Contributions—A Bird's Eye Perspective

Overall, 45 percent of the climate contributions submitted in the run-up to COP21 entail a direct reference to trade or trade elements and 22 percent include specific trade elements that are geared towards fostering mitigation.¹⁴ The largest emitters and exporters of embedded carbon, however, do not tend to be among them (see also Figure 1 and Section 4.2). At the same time, almost all climate contributions do include references to elements that are in one way or another related to trade (e.g. renewable energy as a mitigation sector, energy subsidies or technology transfer), and these elements are also important and should be taken into account

¹⁴ The data on the trade-related elements in the INDCs and NDCs presented in 4.1, with the exception of international market mechanisms, response measures and co-benefits, stems from the NDC Explorer (<http://klimalog.die-gdi.de/ndc>), prepared by Pauw et al. (2016) in the context of the Klimalog project of the German Development Institute/Deutsches Institut für Entwicklungspolitik (DIE). The term "specific trade elements" in Section 4.1 refers to trade elements that represent instruments for climate change mitigation and include references to the reduction of trade barriers, the regulation of trade on climate grounds, including in the case of timber, as well as relevant standards and labelling schemes. The maps in Section 4 illustrate the content of the INDCs because they provide a more complete picture as, to date, not all INDCs have been converted into NDCs; however, very few countries change the content of their contribution in the course of that conversion.

in order to avoid trade conflicts and foster coherence between trade and climate objectives (for an overview, see also Table 5 in the Annex).

Figure 1: Specific Trade Elements in Countries' Climate Contributions



Source: Pauw et al. (2016)

Following their ratification of the Paris Agreement, many countries have moved from having INDCs to having NDCs, but very few countries have adjusted their “contributions” in that process. To date, only three NDCs are different from the INDCs: those of Belize, Morocco, and New Zealand. In the case of Belize, there are no changes regarding the trade elements: in both its INDC and NDC, there is a general reference to trade but no more far-reaching reference to trade or trade-related measures to foster mitigation. However, in the case of New Zealand and Morocco, the trade elements were modified. While New Zealand’s INDC included a general reference to trade and tied its emissions status to its export-oriented agricultural sector,¹⁵ its NDC no longer refers to trade. By contrast, Morocco’s NDC includes a more specific reference to trade (according to its NDC, Morocco aims at reaching a “95% rate of traded species managed sustainably” by 2020) than its INDC, which merely included a general reference to trade without any mention of fostering climate mitigation or other environmental goals.

4.1.1 Reducing trade barriers

Six percent of countries’ climate contributions indicate the relevant party’s intention to lower trade barriers in order to contribute to mitigating climate change. Again, the most important emitters and exporters of embedded carbon typically do not explicitly refer to the reduction of

¹⁵ According to the INDC (p. 3), “New Zealand is a small, narrow, island country with an open, trade reliant economy that is founded in our land sector [...] Around 74 percent of New Zealand’s exports come from the land sector. Agricultural emissions derived from the production of food for the rest of the world account for approximately half of our total greenhouse gas emissions. However, New Zealand is one of the most efficient agricultural producers in the world.”

trade barriers in their climate contributions (see also 4.2). Instead, it is rather the smaller countries that underline the commitment to make use of this approach, many of them SIDS, that is, low-lying coastal countries. These countries tend to be both highly susceptible to the impacts of climate change and highly dependent on international trade: Bahamas, Cuba, Djibouti, Guyana, Lao PDR, Niue, Saint Lucia, Saint Vincent and the Grenadines, Seychelles and Togo.

Above all, the climate contributions refer to the reduction of trade barriers that can contribute to renewable energy development and to promoting more climate-friendly vehicles. For instance, both Guyana and Lao PDR mention the removal of their import duties to foster renewable energy development by reducing trade barriers for the import of renewable energy equipment. The Bahamas, Saint Lucia and Saint Vincent and the Grenadines mention the reduction of their import duties on certain types of vehicles, including hybrid and electric cars. While a number of countries, as mentioned above, explicitly indicate their commitment to reduce trade barriers to foster the mitigation of climate change, there is substantial potential for a stronger emphasis on this type of trade-related measure for climate protection.

4.1.2 Regulating trade on climate grounds

Eleven percent of all climate contributions explicitly refer to the use of trade measures to regulate imports on climate grounds. These include Antigua and Barbuda, Bahamas, Republic of Congo, Cook Islands, Djibouti, Eritrea, Gabon, Haiti, Kuwait, Mauritania, Namibia, Nigeria, Saint Lucia, Samoa, South Sudan, Togo, Tuvalu, and Venezuela. Again, the most important emitters and exporters of embedded carbon tend not to be among them, except for Kuwait, which has one of the highest levels of per capita emissions worldwide.

More specifically, several climate contributions mention the regulation of, or even a ban on the import of old or inefficient vehicles. For example, according to the climate contribution of Bahamas, the country “will discourage the importation of inefficient motor vehicles by linking the tax regime to mileage per gallon and the engine capacity.” Saint Lucia mentions a “new levy to control importation of used vehicles.” Eritrea refers to the “restriction on import of used cars” as part of its planned “mitigation measures.” Nigeria’s climate contribution mentions enforcement of the import ban on cars that are more than 15 years old.¹⁶ Other countries focus on the import of electric appliances. For example, Namibia plans to “set regulations to ensure import of energy efficient appliances,” and Venezuela mentions banning the import of light bulbs and inefficient appliances. It is also worth noting that, as the analysis of the climate contributions reveals, more countries explicitly refer to introducing and making use of trade measures to *regulate* imports (18) compared to *reducing* such measures (10). As a result, there might be a risk of protectionist abuse of trade measures and an increase of trade conflicts.

¹⁶ Djibouti’s INDC mentions as one measure the “Restriction des imports de voitures anciennes: Suppression de l’import de 10000 voitures anciennes et trop polluantes.”

4.1.3 Regulating timber trade

Only 3 percent of all climate contributions specifically mention international trade in timber: Cambodia, Côte d'Ivoire, Guinea-Bissau, Guyana, Lao PDR and Myanmar. For example, Guinea-Bissau's climate contribution refers to a ban on exporting timber from protected areas. A number of climate contributions refer to the EU FLEGT programme, among them Guyana, Cambodia, Lao PDR and Myanmar. For instance, Cambodia's climate contribution mentions the implementation of the FLEGT programme in its country "to improve forest governance and promote international trade in verified legal timber." However, the countries with the biggest tropical rainforests—Brazil, Democratic Republic of Congo, Indonesia, Peru, and Colombia—do not explicitly refer to timber trade in their climate contributions. This lack of reference is an untapped trade-related mitigation opportunity in the climate contributions under the Paris Agreement.

4.1.4 Standards and labelling

Eleven percent of all climate contributions refer to plans to use standards or labelling: Antigua and Barbuda, Brazil, Brunei, Cabo Verde, Gambia, Guyana, Macedonia, Niue, Saint Vincent and the Grenadines, Samoa, Seychelles, Sudan, Tuvalu, United Arab Emirates, Vietnam, and Yemen. Most of these refer to energy efficiency standards for electrical appliances, such as refrigerators, while some also refer to efficiency standards for vehicles. For example, Vietnam seeks to "label energy-saving equipment and issue national standards" and Bahamas mentions the option "to regulate motor vehicle emissions by setting and enforcing standards."

4.1.5 Border carbon adjustments

Only one climate contribution includes an explicit reference to border carbon adjustments. The Mexican contribution states that its 25 percent emissions reduction commitment could be increased to 40 percent, subject to a number of conditions, including border carbon adjustments. Mexico is therefore the only country to explicitly put the possibility of border carbon adjustments on the table, though this does not mean that others may not consider it.

4.1.6 Fossil fuel subsidy reform

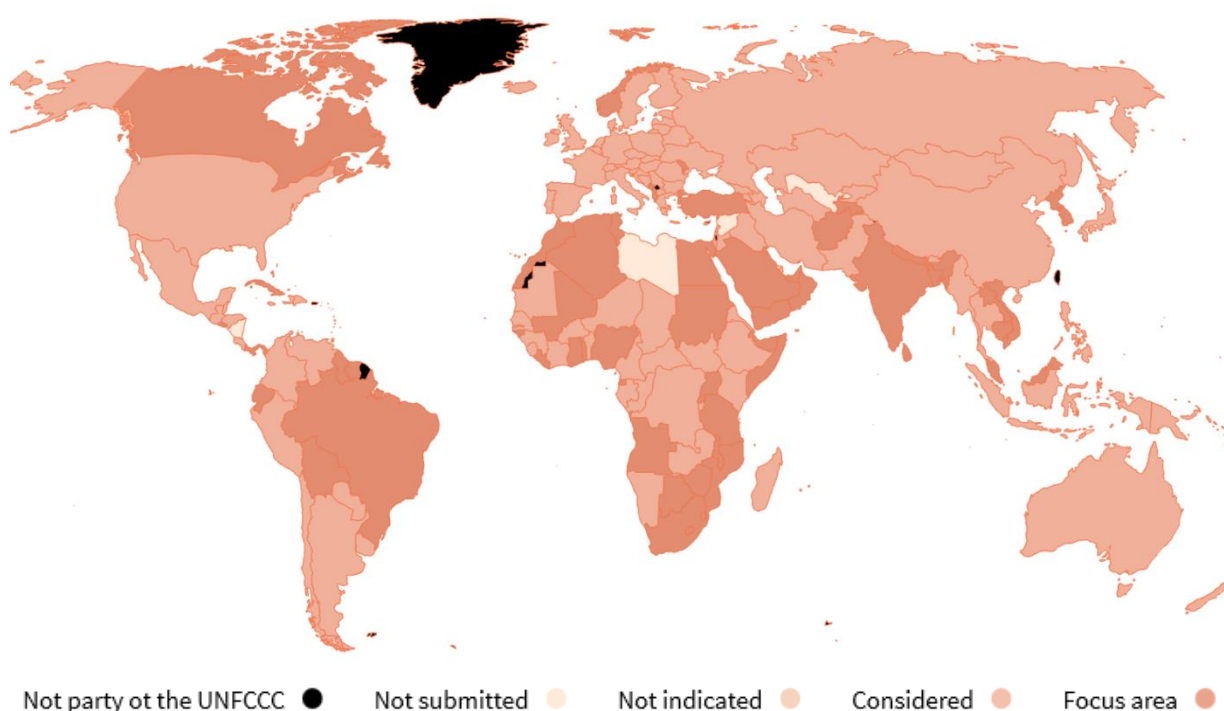
Several parties include a reference to the reform of fossil fuel subsidies in their climate contributions: Brunei, Burkina Faso, Egypt, Ethiopia, Ghana, India, Nigeria, Saudi Arabia, Venezuela, and Vietnam. 6% of all climate contributions indicate plans to pursue a fossil fuel subsidy reform. Some of these further indicate co-benefits of doing so in terms of other outcomes: Brunei, Burkina Faso, Ethiopia, Morocco, Nigeria, Saudi Arabia, Venezuela, and Vietnam. For example, Brunei plans a review of fuel subsidies as a means of managing the increase in road traffic, while Ethiopia and Burkina Faso seek to remove fossil fuel subsidies to enhance the generation and use of clean and renewable energy. According to Nigeria, "the removal of consumer and producer subsidies for fossil fuels can help stabilize government budgets. While intended to reduce the cost of living for the poor, these subsidies have ended up mostly benefiting the rich."

4.1.7 Renewable energy

An analysis of countries' climate contributions underlines that the majority of countries seek to address emissions through investment in renewable energy. Almost all countries consider renewable energy in their contributions (161) and more than half of them mention it as a priority sector for mitigation (84) (see also Figure 2). While both developed and developing countries refer to renewable energy, those mentioning it as a priority area are mostly developing and emerging economies, apart from a few countries like Canada or Norway (see also Table 5 in the Annex). Many countries have announced relative or absolute targets, and some provide detailed policy plans in their NDCs.

Scaling up renewable energy is a key approach to mitigating climate change and can generate many development co-benefits. However, the manifold references to renewable energy as an important element for mitigation in the climate contributions suggest, in light of the increasing number of trade disputes in that regard, that we may see a growing number of measures that might not be in line with the trade regime, above all in the context of renewable energy subsidies.

Figure 2: Renewable Energy in the Countries' Climate Contributions



Source: Pauw et al. (2016)

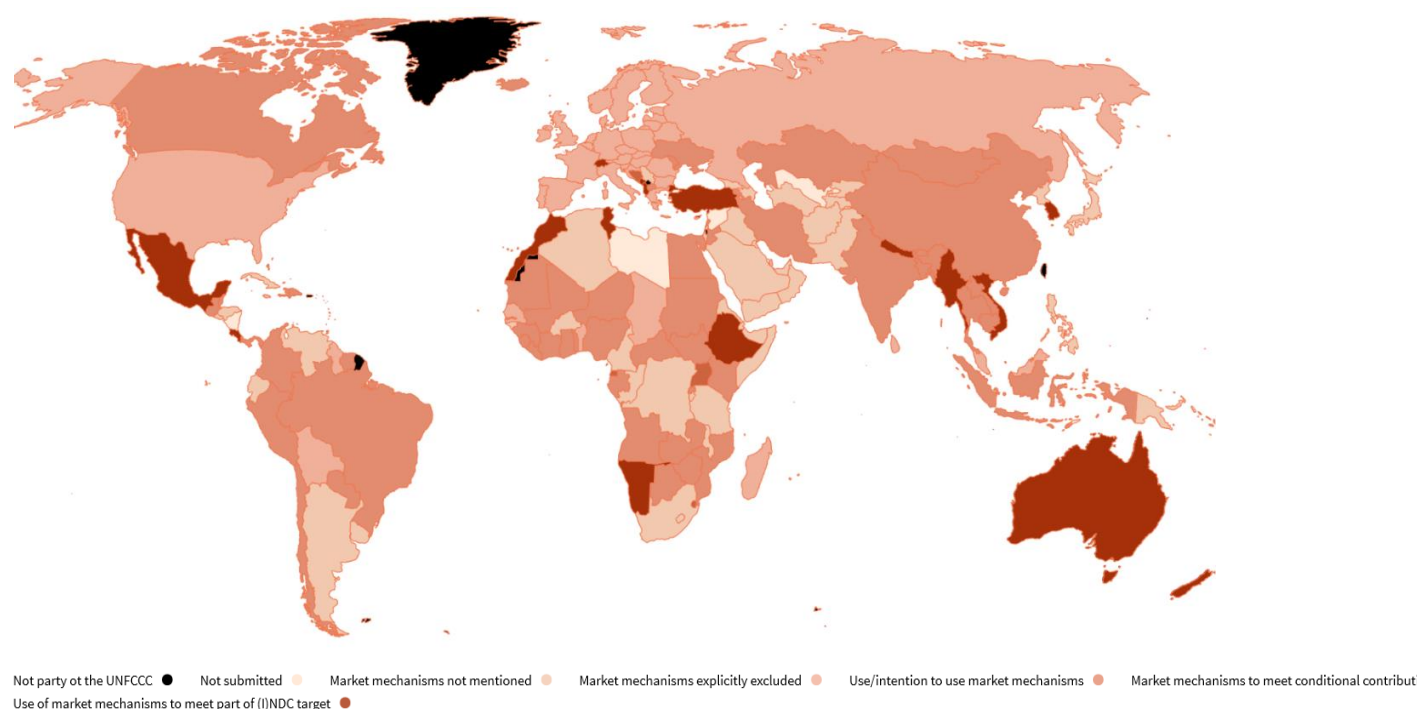
4.1.8 International market mechanisms

While 11 percent of all climate contributions incorporate an explicit rejection of the use of international market mechanisms, 56 percent indicate an explicit interest in using them (Kreibich 2016). Since around half of all contributions are conditional upon access to international markets (EDF and IETA 2016), these provisions are key for combating climate

change (see also Figure 3). Several countries, above all low-income countries, seek to sell some type of mitigation unit, if this trading option is operationalised under Article 6 of the Paris Agreement, in order to generate financial flows. At the same time, only a few countries have indicated their willingness to purchase such units, among them Japan, Norway, Switzerland and Turkey (Kreibich and Obergassel 2016).

While the current climate contributions of some countries exclude the use of international credits towards meeting their targets, this does not mean that they are opposed to carbon markets per se, or to cooperating on them. The EU NDC, for example, explicitly excludes the use of international credits. Nevertheless, the EU operates the largest domestic carbon market and is actively pursuing carbon market cooperation, including linking. For instance, the EU has launched the G7 Carbon Market Platform and is closely cooperating with South Korea as well as China to eventually link their emissions trading schemes.

Figure 3: International Market Mechanisms in Countries' Climate Contributions



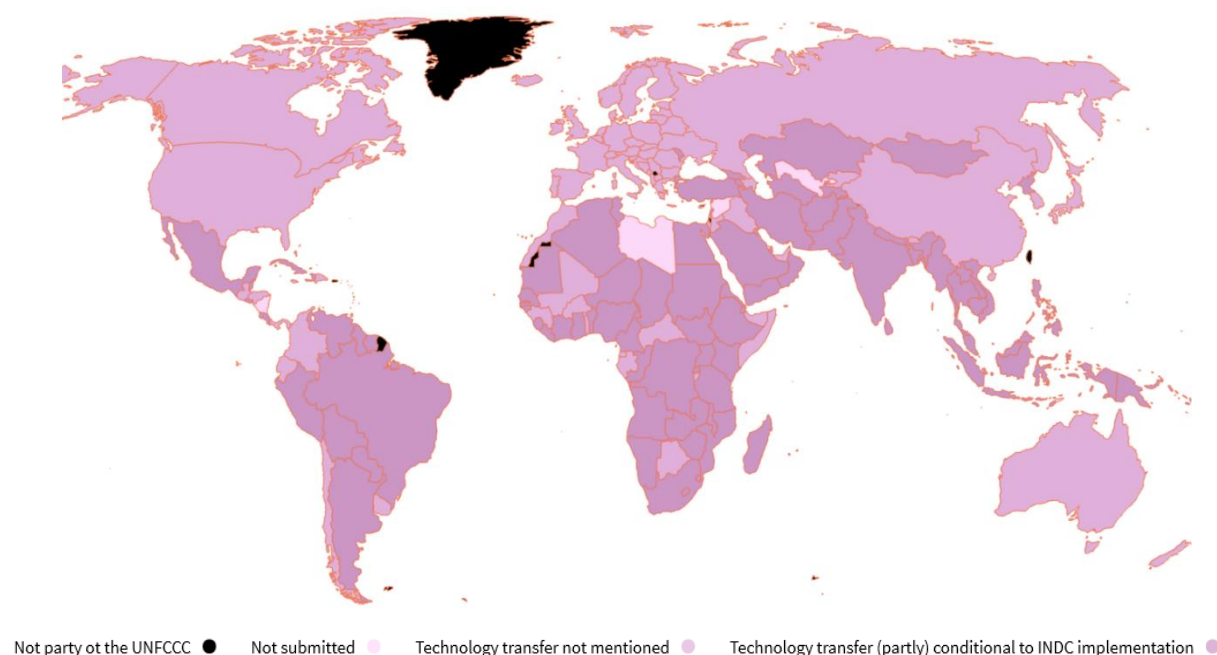
Source: Pauw et al. (2016)

4.1.9 Technology transfer

Sixty-three percent of all climate contributions make an explicit reference to their contribution being fully or partly conditional on technology transfer (see Figure 4). Technology transfer is important to promote climate protection because the scale-up of climate-friendly technologies, such as clean energy or energy efficiency technologies, is crucial for reaching the objectives of the Paris Agreement. All countries that mention technology transfer are developing or emerging economies (see Table 5 in the Annex). Large-scale and effective technology transfer is key for their transition towards low-carbon economies. The analysis of the climate contributions underlines the important role of the transfer of climate technologies—and the significance of taking account of this in the context of the trade regime. While most climate contributions are

rather generic in this regard, that is, simply stating the need for technology transfer, some are more specific and give more details on what they need.

Figure 4: Technology Transfer in Countries' Climate Contributions



Source: Pauw et al. (2016)

4.1.10 Response measures

Six climate contributions explicitly refer to the impacts of response measures. These include Algeria, Bahrain, Iran, Kuwait, Qatar, and Saudi Arabia. For example, Qatar emphasises that its “ecological and human systems are vulnerable to the adverse impact of climate change as well as the impact of response measures due to its unique circumstances.” Kuwait’s contribution, meanwhile, indicates that “the State of Kuwait will suffer from economic and social consequences of negative impacts of response measures, where Kuwait is considered one of the countries [whose economy is] dependent on oil and will be affected negatively from international policies and procedures of the UNFCCC.” The countries referring to response measures in their climate contributions are those with significant oil reserves and major oil-exporting economies. Therefore, despite an apparent evolution of the response measures forum towards discussions about sustainable transition, the issue of response measures is still largely tied to major oil-exporting countries.

4.1.11 Co-benefits in the context of trade

As indicated above, trade and trade-related elements and measures in the context of the NDCs can imply both trade-offs and co-benefits—and a number of climate contributions take account of the latter. Six percent of countries’ climate contributions mention co-benefits that arise in relation to trade elements or trade-related measures, including Antigua and Barbados, Bahamas, Dominica, Jordan, Maldives, Nigeria, Niue, Rwanda, Saint Lucia, Seychelles, and Tuvalu. Many of these contributions refer to the potential of renewable energy development

(e.g. on the basis of hydropower or solar energy) to foster exports (of renewable energy) and to reduce import dependency on (expensive) fossil fuel imports, thereby, for example, freeing up financial means in the public budget for other focal areas such as health or education.

While the spotlight in this paper is on links to trade elements that are relevant to the mitigation of climate change, trade and trade-related measures can also figure in adapting to the impacts of climate change (e.g. Stephan and Schenker 2012), for instance in terms of agricultural trade. Insofar as climate change modifies productive capacities for food production, international trade permits countries to safeguard food security by using imports rather than domestically produced food supplies (Jegou 2016). While most references to trade in the climate contributions concern mitigation, several contributions bring up international trade in the context of adaptation, among them the Republic of Congo, Côte d'Ivoire, Dominica, Rwanda, Seychelles, Singapore, United Arab Emirates, and Yemen, including a highlight on an increased reliance on food imports due to the impacts of climate change on the domestic agricultural sector and on food production.

4.2 Summary of the Trade Analysis of the Climate Contributions

Trade-related elements feature prominently in climate contributions under the Paris Agreement. Yet, there is substantial untapped potential. Direct references to making use of trade measures to foster climate protection do not play a prominent role in the current contributions—although these offer ample opportunities for fostering coherence between trade and climate measures. For example, less than one quarter of countries' climate contributions include a trade element that is relevant for fostering mitigation. There is thus considerable room for a stronger emphasis on this type of trade-related measure for climate protection, especially among the major emitters and exporters of embedded carbon. While most industrialised countries, that is, the major emitters, have submitted very general and broad commitments, developing countries and LDCs have submitted more detailed nationally determined contributions, which also include trade elements (Elkahwagy, Gyanchandani and Piselli 2017). Moreover, countries that are strongly susceptible to the impacts of climate change and highly dependent on trade, for example SIDS and members of AOSIS, seem to be more aware of the interlinkages between international trade and climate change and have included more trade elements in their climate contributions under the Paris Agreement.

At the same time, there are numerous references to trade-related elements in the climate contributions that are more indirectly linked to trade issues. While around 6 percent of all climate contributions mention a reduction of trade barriers, around 11 percent entail a reference to the regulation of trade on climate grounds. Around 3 percent respectively refer to timber trade and to response measures, 6 percent indicate plans to reform fossil fuel subsidies, and 9 percent mention standards or labels. The most common trade-related elements are international market mechanisms, technology transfer and renewable energy. More specifically, 56 percent indicate an interest in using international market mechanisms, 63 percent indicated that their contribution was conditional on technology transfer, and almost all

contributions mention renewable energy as a mitigation sector, with more than 50 percent referring to it as a priority sector. Some trade-related elements are thus mentioned in virtually all climate contributions, others only by some. While certain issues, for example trade in timber, are only of relevance to a subset of countries, the manifold references to some form of trade-related elements illustrate that the interaction between trade and climate is increasing in the wake of the implementation of the Paris Agreement. The inclusion of trade-related elements can generate both opportunities and conflicts in the relationship between trade and climate objectives. They have to be taken into account for circumventing trade conflicts and promoting more coherent policymaking.

Examining the contributions of selected parties in the latter part of this section indicates that the major emitters/net exporters of embedded carbon do not focus strongly on trade or trade-related measures—they do so even less than the average of climate contributions. More than half of the selected climate contributions do not include any reference to trade at all and not a single one of them includes a reference to trade measures contributing to the mitigation of climate change.

For instance, none of the selected contributions spotlights the reduction of trade barriers to promote climate protection, thereby making no use of the opportunities of trade liberalisation to contribute to mitigating climate change. Moreover, none of them focuses on regulation of the trade in timber. While the issue of illegal logging is only relevant for a few countries in the sample, including Brazil, Indonesia and Democratic Republic of Congo, it is interesting to note that these countries do not refer to trade-related approaches to fostering legal timber trade. Regarding standards and labels, only Brazil and India mention these in their climate contributions. Just three out of the 21 climate contributions, namely India, Morocco, and Saudi Arabia (plus New Zealand in its former INDC), mention plans for fossil fuel subsidy reform. However, all the selected countries consider renewable energy in their contributions and ten of them, namely Brazil, Canada, India, Maldives, Morocco, Norway, Saudi Arabia, South Africa, South Korea, and Trinidad and Tobago, identify it as a priority sector for mitigation. Fourteen parties mention international market mechanisms in their climate contributions: eight signal the use or the intention to use them (Brazil, Canada, Chile, Indonesia, Iran, Morocco, New Zealand, and Trinidad and Tobago), two indicate the commitment to use them to meet part of their INDC target (Mexico and South Korea), and four explicitly exclude their use (EU, Norway, Russia, and the US). Finally, two countries mention “response measures” in their contributions, both of which are economies highly dependent on fossil fuel: Iran and Saudi Arabia. This implies that the issue is still closely related to the interests of oil-exporting economies.

Overall, there is thus great potential for including more trade elements in future NDCs in order to improve the mutual supportiveness of trade and climate objectives in countries’ contributions under the Paris Agreement. There is also substantial room for including more trade elements in order to make better use of trade for fostering the implementation of countries’ overall climate targets. Given the status of many of the selected countries as major emitters and key economies as well as negotiating countries in the UNFCCC, this is truly a missed opportunity.

5. MAKING NDCS AND TRADE MUTUALLY SUPPORTIVE

Based on the preceding analysis, this section identifies options for how trade frameworks can support the NDCs' climate efforts and ways forward to address trade-related concerns resulting from climate measures. There are a number of trade elements to be considered and in light of the manifold differences among countries, there is no single silver-bullet recommendation. Rather, each country will need to identify its own pathway against the background of its particular capacities and goals. However, there should be general agreement on fostering coherence between the trade and the climate regimes.

First of all, there are several options to make sure that future NDCs take more systematic account of trade and trade-related elements (5.1 below). Moreover, there are a number of key issues that are relevant for, or increase the role of trade rules in supporting climate protection in the context of the NDCs (5.2). Furthermore, a way forward is to increase and improve the institutional interaction between the trade and the climate regimes to encourage NDC implementation and reduce potential trade concerns and conflicts in that connection (5.3). In addition, preferential trade agreements offer the potential to foster climate actions (5.4). Last but not least, another way forward is to support developing countries in benefiting from trade opportunities in the context of the NDCs (5.5).

5.1 Strengthening Climate-Friendly Trade Elements in Future NDCs

One key option for the pathway forward is to make sure that climate-friendly trade elements are more systematically incorporated into future NDCs.

5.1.1 Taking advantage of trade opportunities

Since trade and trade-related measures offer considerable opportunities to support climate action, governments drafting future NDCs should take better account of these opportunities and make more systematic use of them. For instance, lowering trade barriers can promote the international trade of goods and services that contribute to the mitigation of climate change, support the development of the market for renewable energy and energy-efficient technologies, and stimulate their diffusion. While trade measures are typically not taken into account as important potential contributors to the achievement of climate targets, they can significantly complement and leverage emissions abatement and climate change mitigation efforts, above all if they are supported by other domestic policies, regulations and incentives. In that context, the goals of the 2030 Agenda should also be taken into account in order to harness additional synergies.

5.1.2 A trade measures "toolbox"

Trade opportunities in future NDCs can be taken up more systematically if countries are aware of the various potential trade elements and their opportunities through a trade measures "toolbox." For example, low-carbon markets can offer new trade opportunities and help countries gain market shares. Against this background, it is important to inform decision-makers

about the advantages of harnessing trade opportunities in the NDCs and the many co-benefits this can involve. National assessment of specific trade opportunities can help in the design of tailor-made trade elements. For instance, conducting national assessments of the sectors with potential comparative advantage can be helpful in leveraging export opportunities (Cosbey 2016).

5.1.3 Guidelines for future NDCs

One reason for the limited use of trade elements in the climate contributions so far might be a lack of certainty about what should or could be included in the NDCs. Moreover, a lack of expertise in the analysis of technical options in the trade realm might also have played a role. Since countries will be asked to submit an updated NDC every five years, future NDCs will be able to include more trade elements. Better guidance by the UNFCCC on how to prepare these updated NDCs and more standardised submissions, including in terms of trade opportunities, and more awareness of the potential of trade elements as well as more expertise in that regard can foster the synergies between trade and climate objectives in future NDC cycles under the Paris Agreement.

5.2 Mutual Supportiveness between Trade and Climate

Addressing the following key issues can contribute to fostering mutual supportiveness between trade and climate objectives.

5.2.1 Supporting renewable energy

Almost all climate contributions include a focus on and envisage more support for renewable energy. There already are many WTO disputes over renewable energy and, as a result of new measures in the NDCs, we can expect a growing number of renewable energy measures and relevant regulations, some of which may not be in line with WTO rules—above all in the context of subsidies for renewable energies. In light of this, possible ways forward include the following options.¹⁷ Novel agreements for fostering renewable energy should be considered, for example a sectoral agreement such as a Sustainable Energy Trade Agreement that seeks to reduce barriers to trade in goods and services relevant for the supply of renewable energy (ICTSD 2011a; Monkelbaan 2013; Hufbauer, Meléndez-Ortiz and Samans 2016). Moreover, energy subsidies should be included as part of regional agreements (Espa and Rolland 2015). In addition, WTO members should seek to safeguard policy space for renewable energy policies, for instance by carving out certain policies from SCM disciplines. If a formal amendment of the SCM Agreement is out of reach, alternative options should be pursued, for example an adjustment of the SCM Agreement through an interpretive understanding that safeguards policy space for renewable energy policies (Howse 2013; Meléndez-Ortiz 2016). Moreover, in the future, the WTO and its member states should focus more attention on renewable energy trade, that is, trade in electricity generated by renewable energy, through trade arrangements

¹⁷ See also Dröge et al. (2016, 41).

such as the Energy Charter. This is an important emerging issue for the WTO because the current WTO principles do not aptly cover trade in energy nor do they apply safeguards or incentives for it.

5.2.2 Removing fossil fuel subsidies

The elimination of fossil fuel subsidies is essential for combating climate change. Importantly, this is something which can be done unilaterally. The WTO could help with enforcement but it is not a necessary requirement for making progress. Therefore, the removal of fossil fuel subsidies is something that countries could pursue through their NDCs. At the same time, the reform of fossil fuel subsidies could be promoted if these subsidies, given their climate impacts, were to be considered as “prohibited” or “actionable” under trade law (Horlick and Clarke 2016), implying that they could be challenged by WTO members under the SCM Agreement. While such a reform is currently unlikely, there are also promising ways forward that improve the transparency of fossil fuel subsidies without necessitating any WTO reform (Dröge et al. 2016). Options include introducing a novel template to notify additional details on subsidies in a standardised manner (Steenblik and Simón 2011) or permitting non-governmental organisations to make information on non-actionable subsidies public (Casier et al. 2014).

5.2.3 Strengthening technology transfer

Technology transfer through international trade can be an important means of implementation for the NDCs. Technology transfer and the enforcement of intellectual property rights continue to be highly controversial, above all in light of ongoing debates about the interpretation of the TRIPS Agreement (Yu 2016). One option for reform is to create a declaration on intellectual property and climate change in line with Doha Declaration on the TRIPS Agreement and Public Health, which reaffirms the flexibility of WTO members in circumventing IPRs like patents in order to provide better access to essential medicines (Abbott and Reichman 2007). A similar approach could be used to clarify certain TRIPS provisions to facilitate the transfer of climate technologies, for example on the basis of a waiver of TRIPS Article 31(f) in order to grant compulsory import licences for climate technologies in certain cases (Maskus and Okediji 2010). Such a waiver would open the way to making use of a patent for such technologies without seeking the patent holder’s consent, while paying the patent holder a fee for the licence and thus establishing an exception to the rule that the intellectual property owner enjoys exclusive rights and may decline to license its use. While IPRs are not necessarily the biggest barrier to technology transfer, achieving more common ground on intellectual property issues among WTO members, including in the TRIPS Council, would be helpful in promoting the transfer of climate-friendly technologies.

5.2.4 Addressing carbon leakage

Several countries plan to make use of domestic carbon pricing and emissions trading in order to achieve their mitigation targets. As mentioned above, worries about implications for competitiveness could foster debates about carbon leakage and the potential use of trade

measures to adjust carbon prices at the border. While the legal status of border carbon adjustments is unclear, different options for their introduction do appear to be available, including following the non-discrimination principle of Article III GATT and the requirements for an internal tax (Dröge et al. 2016), or applying the Article XX GATT exemption (Cosbey et al. 2012). More detailed codes of conduct for border carbon adjustment measures would be useful, above all in light of their controversial legal and also political nature.

In this context, it should also be noted that establishing a global price on carbon or a regime of carbon taxation, even if currently unlikely, would not only be important for fostering climate protection, but would also reduce potential carbon leakage concerns and hence the perceived need for border carbon adjustments since there would then be no reason to limit trade on climate grounds. This would substantially decrease the risk of future tensions between trade and climate. In the absence of a global carbon price, linking (sub)national carbon markets, for instance under Article 6 of the Paris Agreement, could generate a more harmonised carbon price, thus also reducing carbon leakage and competitiveness concerns. In this context, the trade regime can make a positive contribution to the implementation of the Paris Agreement by supporting the development of bi- and plurilateral climate action. Doing so could achieve more harmonisation between the manifold national climate actions and lower the costs of implementation, thereby reducing competitiveness and carbon leakage concerns and helping countries commit to more ambitious climate action (Hawkins 2016).

5.2.5 Facilitating international market mechanisms

International market mechanisms offer potential for climate change mitigation. While the trading of international emission reduction units is not subject to controversy from the perspective of the trade regime per se, there are some issues that entail a lack of clarity and should be addressed.¹⁸ These include the provision of a more clear-cut definition of the relevant services under the GATS Annex on Financial Services (Munro 2014).

5.2.6 Harmonising low-carbon standards

An additional way forward is to harmonise low-carbon standards, or at least their underlying methodological approaches, in order to improve transparency for consumers and producers and to facilitate market access for exporters. Moreover, mutual recognition agreements for standards and labels should be considered once there is more harmonisation of their underlying methodology. In addition, stringent mandatory domestic product standards can increase domestic demand for low-carbon and sustainable products (Cosbey 2016).

5.2.7 Addressing the relationship between trade and climate

WTO members, through the 2001 Doha Ministerial Declaration, and UNFCCC parties have repeatedly affirmed the need to make the trade and the climate regimes mutually supportive.

¹⁸ For discussion of trade-related aspects of carbon market cooperation (e.g. making emissions trading exclusive to club members), see Hawkins (2016).

However, this goal has not yet been achieved. One option is to modify WTO agreements to provide better legal guidance on the relationship between the trade regime and climate actions. Since the case-by-case character of WTO disputes does not offer sufficient structural legal guidance for implementing NDCs and since climate-related disputes are settled by a body that focuses essentially on the rules of the multilateral trading system (Bacchus 2016), WTO members should offer better legal guidance to spell out the relationship between trade rules and climate measures. This can be done, for instance, through an amendment, a waiver, an authoritative interpretation, a peace clause or adjustments to the WTO dispute settlement mechanism (Dröge et al. 2016, 34–8). A more constructive discussion on trade and climate change in the UNFCCC's response measures forum could also be helpful.

5.3 Fostering Interaction between UNFCCC and WTO

The WTO and the UNFCCC could foster interactions between the climate and trade regimes, and promote transparency in that regard. This could involve a stronger focus on climate change in the WTO's Committee on Trade and Environment. Improved coordination and exchange of information on NDC implementation between existing bodies in the trade regime and the climate regime would also be a positive help, for instance the WTO's Committee on Trade and Environment or the Trade Policy Review Mechanism, on the one hand, and the UNFCCC's Subsidiary Body on Scientific and Technological Advice, specifically the forum on the impact of the implementation of response measures, on the other hand (Dröge et al. 2016).

5.4 Making Preferential Trade Agreements More Climate Friendly

The recent challenges for the trade regime, above all due to the Doha deadlock and the rise of bilateral and regional trade agreements as well as new mega-regionals, entail both promises and pitfalls for combating climate change. These include room for novel climate-supportive trade rules, but also limited multilateral guidance and a rising incidence of climate-related trade disputes. Preferential trade agreements can contribute to strengthening coherence between the trade and the climate regime in the following ways.

5.4.1 Bilateral and regional trade agreements

Facilitating the trade of environmental goods and services can contribute to the mitigation of climate change (Sugathan 2015), for instance by reducing trade barriers in bilateral and (mega-)regional trade agreements. Moreover, bilateral and (mega-)regional trade agreements could incorporate innovative approaches to climate and trade and foster the diffusion of climate-friendly provisions and rules (Holzer and Cottier 2015). In this regard, the EU has emerged as a pioneer (Gehring et al. 2013; Morin, Michaud and Bialais 2016).¹⁹

5.4.2 Plurilateral trade agreements Plurilateral trade negotiations, under the auspices of the WTO, could also help generate rules for trade and climate policy among WTO members. Building

¹⁹ For an analysis of the diffusion of environmental provisions more generally, see Berger et al. (2017) and Bruhn et al. (2016).

on the negotiations for the Environmental Goods Agreement, focused on eliminating tariffs on a range of environmental goods, including many relevant to climate change mitigation, could make progress on central themes such as services and non-tariff barriers and help to promote climate objectives (Vossenaar 2014). Looking ahead, one promising option, as indicated above, would also be a plurilateral trade agreement that focuses on renewable energy.²⁰

5.5 Supporting Developing Countries in Benefiting from Trade Opportunities

Another important way forward is to support developing countries in benefiting from opportunities from trade measures and trade-related elements in the NDCs, thereby also creating co-benefits such as energy security and economic diversification.

5.5.1 Fostering expertise on trade measures

Strengthening expertise in developing countries on the trade measures “toolbox” and the potential of trade elements in the NDCs can help them reap trade benefit and also foster the synergies between trade and climate objectives in future NDC cycles. The response measures forum would be one suitable option for building this capacity.

5.5.2 Using market mechanisms as source of finance

The new international market mechanisms under the Paris Agreement, which are still to be operationalised, can help developing countries attract climate-specific finance, and parties should observe progress in the relevant negotiations and undertake the needed preparations in order to be able to take advantage of the resulting mechanisms (Cosbey 2016).

5.5.3 Strengthening trade opportunities

Support for innovation can help developing countries benefit from the low-carbon transformation and can be provided, for example, by promoting technology absorption and development by domestic firms through science and innovation policies and by fostering access to technology, with trade policies playing an important role (Cosbey 2013; Rodrik 2014).

6. CONCLUSION AND POLICY RECOMMENDATIONS

With its bottom-up approach to climate action, the Paris Agreement increases interactions between the climate and trade regimes. This makes the need to promote more coherent policymaking and to foster synergies between trade and climate objectives ever more urgent. A proactive approach to using trade and trade-related measures can help to harness the climate potential they entail and speed up the low-carbon transformation. This paper has identified and investigated 11 key trade-related elements in the NDCs, which can involve opportunities but also conflicts in the interaction between trade and climate objectives (see Table 4).

²⁰ For more details on such a Sustainable Energy Trade Agreement, see ICTSD (2011a), Monkelbaan 2013 and Hufbauer, Meléndez-Ortiz and Samans (2016).

While the analysis has demonstrated that trade-related elements feature frequently in countries' climate contributions, there are tremendous opportunities for trade elements in the NDCs that have not been taken advantage of to date. While more than 70 climate contributions include a direct reference to trade or trade measures, only around 22 percent include trade measures that are specifically geared towards mitigation. Only around 6 percent of all climate contributions refer to lowering trade barriers to foster climate change mitigation—whereas several of the others entailing more specific trade-related measures instead indicate plans to use more controversial means, including the introduction of import duties and, in one case, border carbon adjustments, that can lead to more trade conflicts. Moving beyond more specific trade measures geared towards mitigation, almost all countries refer to trade-related elements more broadly defined, for instance regarding renewable energy as a key mitigation sector or mitigation as conditional on technology transfer.

The analysis of the selected climate contributions illustrates that they do not present a strong focus on trade or trade-related measures. More than half do not include any reference to trade at all and the others do not indicate plans to use trade measures to foster the mitigation of climate change. At the same time, they refer to important trade-related elements. In short, examination of the selected climate contributions underlines that they do not incorporate trade elements in a systematic manner and that there is substantial room for including more trade elements in future NDCs in order encourage synergies between trade and climate measures in the context of countries' contributions under the Paris Agreement.

6.1 Summary of Policy Recommendations

There are a number of steps that can be taken to increase the potential of trade and trade measures to support climate protection. These include the following:

Strengthening Climate-Friendly Trade Elements in Future NDCs

- *More trade elements in future NDCs:* Since trade measures can contribute to combating climate change and to fostering the implementation of the NDCs under the Paris Agreement, in the next NDC cycle of the ratcheting-up mechanism governments should take better account of and make more use of trade elements in their NDCs.
- *More awareness of trade opportunities:* Decision-makers' awareness of the advantages of using trade opportunities in the NDCs should be increased.
- *More guidance for NDC updates:* There should be better guidance for drafting future NDCs and the guidelines should describe the opportunities that trade elements offer.

Fostering Mutual Supportiveness between Trade and Climate

- *Renewable energy and support for renewable energy development:* In light of the manifold references to renewable energy development in the NDCs and the rising risk of trade conflicts as a result, WTO members should reform WTO subsidy rules, and new agreements for fostering renewable should be promoted.

- *Removing fossil fuel subsidies:* The elimination of fossil fuel subsidies should feature more frequently and more systematically in the NDCs—which does not necessarily require WTO involvement. At the same time, in the trade regime, the transparency of fossil fuel subsidies should be improved and fossil fuel subsidies should be considered as “prohibited” or “actionable,” meaning they could be challenged by WTO members under the SCM Agreement.
- *Technology transfer for climate technologies and IPRs:* WTO members should adopt a declaration on intellectual property and climate change that helps to stimulate technology transfer by addressing the interpretation of the TRIPS Agreement through a waiver or an authoritative interpretation.
- *Addressing carbon leakage:* In light of increasing concerns about carbon leakage and competitiveness distortions, and the possible increase of the relevance of border carbon adjustments in the context of NDC implementation, there should be international cooperation to generate more detailed codes of conduct for border carbon adjustments. The trade regime should positively contribute by supporting the development of bi- and plurilateral climate action, which could provide for some level of harmonisation between the various national mitigation efforts. This would reduce carbon leakage concerns and lower the perceived need for border carbon adjustments, instead helping countries to scale up the ambition of their climate actions.
- *Improving legal clarity for international market mechanisms:* To foster the potential of international market mechanisms, there should be more clarity on the relevant trade-related questions, for instance a more clear-cut definition of the relevant services under the GATS Annex on Financial Services.
- *Harmonising low-carbon standards:* Voluntary low-carbon standards, or at least their underlying methodological approaches, should be harmonised in order to improve transparency for consumers and producers and to facilitate market access for exporters. More mandatory domestic product standards should be introduced to raise domestic demand for low-carbon goods.
- *Legal guidance to foster support for the climate regime:* An authoritative interpretation of GATT Article XX in relation to climate issues could elucidate the possibilities for exceptions of trade obligations and promote the mutual supportiveness of the trade and the climate regimes.

Fostering Interaction between UNFCCC and WTO

- The WTO and the UNFCCC should promote institutional interaction and transparency by putting climate change on the agenda of the WTO Committee on Trade and Environment and by better coordination and exchange of information on NDC implementation between existing bodies in the WTO and in the UNFCCC.

Making Preferential Trade Agreements More Climate Friendly

- Bilateral and regional as well as mega-regional trade agreements should incorporate innovative approaches and provisions that support climate protection.
- Plurilateral trade negotiations, under the auspices of the WTO, should seek to negotiate rules concerning trade and climate, focusing on services and non-tariff barriers in their relationship to climate objectives.

Supporting Developing Countries in Benefiting from Trade Opportunities

- Strengthening expertise in developing countries on the potential of trade elements in the NDCs can help them benefit and also foster the synergies between trade and climate objectives in future NDC cycles.
- Developing countries should observe the negotiations of the new international market mechanisms under the Paris Agreement to prepare themselves to attract climate-specific finance in that context.
- There should be support for innovation to help developing countries benefit from the low-carbon transformation – also against the background of the 2030 Agenda.

In light of the above, it is necessary to properly consider and better harness the potential of trade and the trade system to positively contribute to climate action. While there is no direct reference to international trade in the Paris Agreement, there are a number of key trade elements that should be taken account of and pursued. This will allow conflicts and concerns arising from unilateral climate action to be addressed and opportunities to be taken to foster synergies between trade and climate objectives as well as to speed up the transformation towards a sustainable future. Doing so would ultimately help achieve the Paris Agreement goals and the SDGs, thus contributing to a more sustainable future for all.

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