

# Potential trade implications of Latin America and the Caribbean's climate commitments under the Paris Agreement

Jon Saalfield

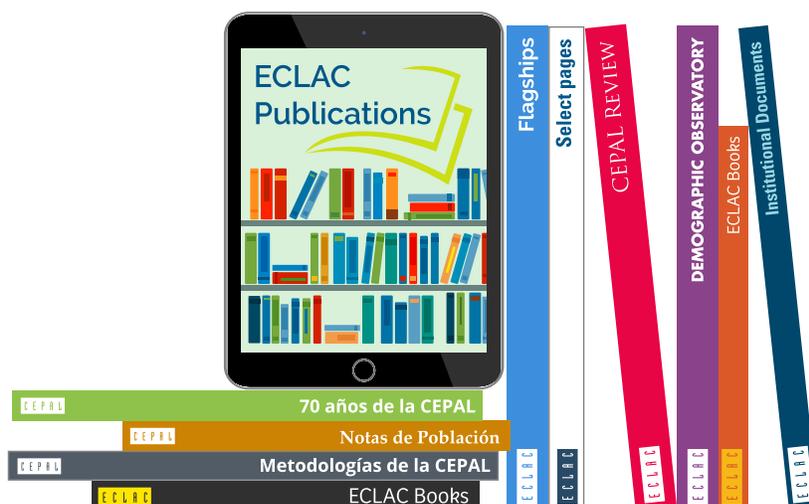


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Jon Saalfield



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**Acronyms**

AE	Advanced economy
CO <sub>2e</sub>	Carbon dioxide and equivalent gases
ECLAC	United Nations Economic Commission for Latin America and the Caribbean
FDI	Foreign direct investment
GHG	Greenhouse gas
ICTSD	International Centre for Trade and Sustainable Development
IFI	International financial institution
LAC	Latin America and the Caribbean
LULUCF	Land use, Land use change, and forestry
MtCO <sub>2e</sub>	Megatons of CO <sub>2e</sub>
NDC	Nationally determined contribution
SIDS	Small island developing states
UNFCCC	United Nations Framework Convention on Climate Change



## Abstract

This paper investigates Latin America and Caribbean (LAC)'s nationally determined contributions (NDCs) and their potential implications for the region's balance of payments. The first section summarizes prevailing trade dynamics, finding that in LAC, exports of raw materials help to cover the cost of importing capital goods.

The second section turns to the region's NDCs to identify policies affecting import expenditure. A simple tally suggests that measures increasing short-term import expenditure (blocking inefficient imports, imposing new domestic standards, and increasing renewable energy capacity) are more numerous and consequential than those reducing import expenditure (reducing trade barriers, reducing dependence on imported fuel, and facilitating technology transfers).

The third section employs a similar methodology on the export side, tallying policies affecting output and global cost competitiveness in key sectors (crops, livestock, timber, metals and minerals, manufactured goods, fisheries, and tourism). This survey finds that the LAC parties to the UNFCCC understand the economic downsides of restricting land use and set out to support their export sectors in equal measure. However, a qualitative analysis of relevant restrictions and enhancements identifies a possible mismatch of both scope and timeframe: supportive measures found in the NDCs may be too little, too late to offset new restrictions in the short term.

The author concludes that an increase in expenditure on capital goods imports coinciding with a reduction in revenue from raw materials exports will contribute to the deterioration of regional balances of payments. Financing widening current account deficits in a high interest rate environment will in turn place pressure on public finances, and the unpopularity of resultant fiscal adjustments will in turn threaten governments' capacities to implement new environmental policies. To ensure the economic and political viability of the commitments found in their NDCs, LAC countries should focus more strongly on targeted, fast-acting, and well-publicized export assistance.



## Introduction

In seeking to understand the trade implications of climate change mitigation in Latin America and the Caribbean, this paper relies on the content of the region's most up-to-date nationally determined contributions (NDCs).<sup>1</sup> Submitted by governments every five years to the United Nations Framework Convention on Climate Change (UNFCCC) under the 2015 Paris Agreement, the NDCs are non-legally binding expressions of a country's climate commitments. While these documents vary significantly in form, tone, and specificity, it is nonetheless possible to extract trade-relevant content from them in a standardized way. This paper will focus on identifying trade-relevant content in two general categories: first, measures impacting expenditure on capital and durable goods imports, and second, measures impacting revenue (as a function of output and cost competitiveness) from key exports, mainly those classified as raw materials. A comparison of the policy tallies in these two categories will be used to draw broad conclusions about climate change mitigation policies' short and medium-term impacts on balance of payments in the LAC region.

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<sup>1</sup> The most recently updated document available for each country as of August 2022. See Annex II for details on which NDC submission has been used as the reference document for each country.

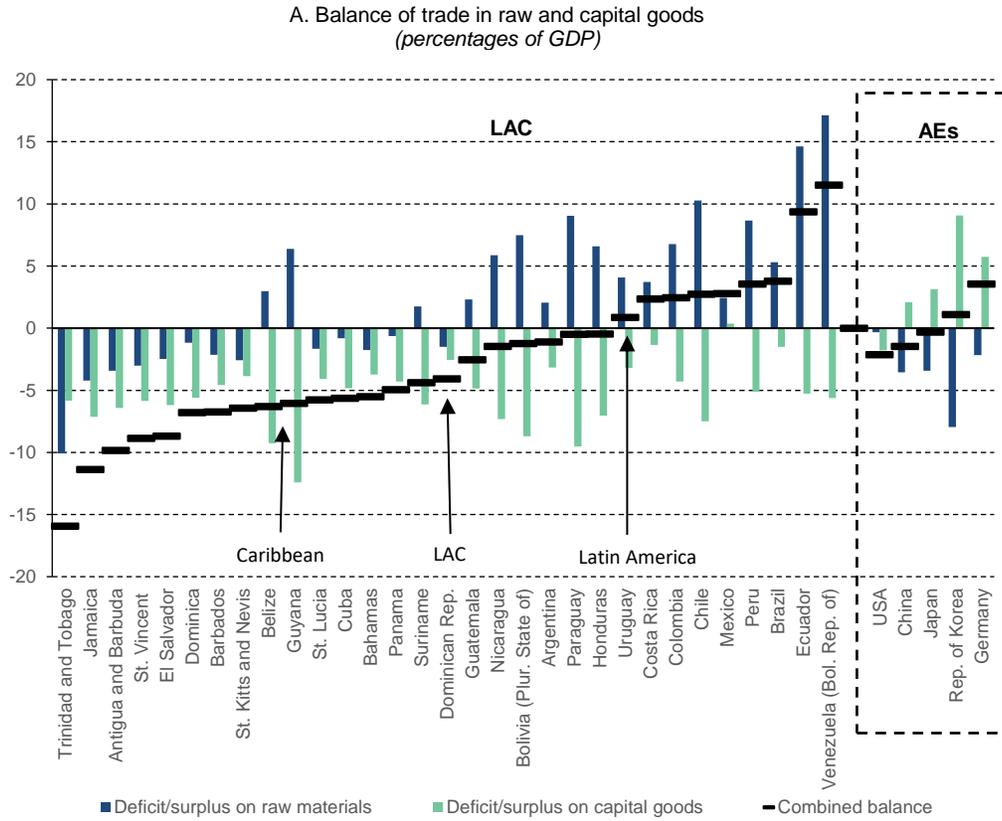


## I. Regional trade profile

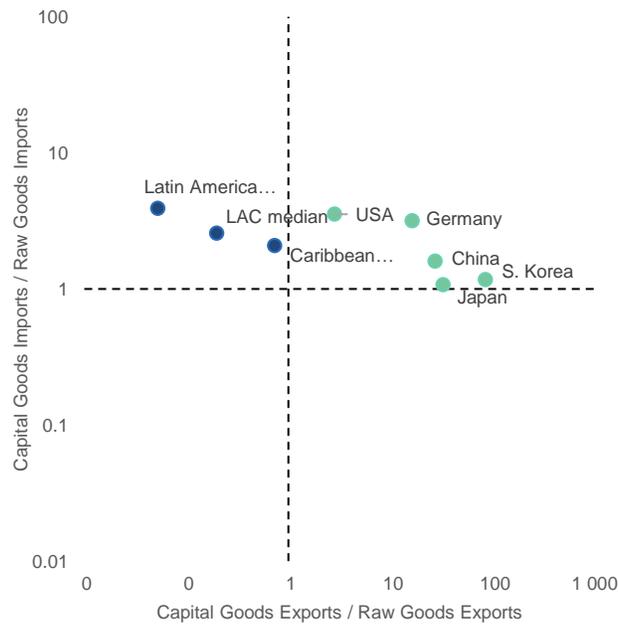
With a few exceptions (most notably Mexico), Latin American and Caribbean economies tend to specialize in producing and exporting raw materials (see figure 1). Earnings from these exports (and from services like tourism) in turn help to cover the cost of importing capital goods from advanced economies (AEs), including emerging economies like China. This dynamic may leave the region exposed to trade imbalances as governments work to mitigate climate change, if new regulations on land use dampen export revenue while demand for clean energy hardware drives up import expenditure.

Persistent trade deficits can lead to serious economic and political crises in the developing world. As hard currency flows out of an economy, a government may be forced to borrow more heavily on international financial markets. If debt service obligations become unmanageable, the real economy will eventually feel the consequences in the form of inflation (if the debt is monetized or if investors flee the market), stagnation (if the government cuts spending or raises taxes), or both. Given these risks, it is necessary to consider where the region's trade balances might be headed as the global economy rebounds from the shock of the COVID-19 pandemic and reorients itself, to varying degrees, around the paradigm of largescale climate change mitigation.

**Figure 1**  
**Latin America and the Caribbean's trade in raw materials and capital goods, 2018**



B. Ratios of capital goods to raw materials in import and export baskets  
 (percentages)



Source: World Integrated Trade Solutions (WITS); World Bank World Development Indicators; and author's calculations.

## II. Import side policies in the NDCs

The methodology applied in this section was inspired by Brandi (2017), wherein the author identifies eleven trade-relevant measures and tallies the frequency with which they are included in the world's NDC submissions. This paper borrows six of those measures and reframes them explicitly in terms of their impact on import expenditure. Three of these measures are assumed to raise the cost of imports: (i) banning the importation of old or energy inefficient goods, (ii) imposing new standards and labeling requirements, and (iii) renewable energy development. The other three measures are assumed to lower the cost of imports: (i) reducing tariff and non-tariff barriers for renewable energy technology, (ii) explicit mention of a policy measure's intention to reduce dependence on imported fuel, and (iii) encouragement of technology transfers from advanced economies. The logic of these assumptions and their tallies in the region's NDCs are outlined in further detail below.

### A. Banning the importation of old or energy inefficient goods

This measure refers to the use of trade mechanisms to control the environmental standards of imported goods. For the purposes of this paper, a policy favoring a new, higher-technology good over its older and cheaper substitute is assumed to increase the average cost of the product group and contribute positively to short-term import expenditure.

Four of 17 Latin American countries and 8 of 16 Caribbean NDCs include commitments to ban the importation of older or less efficient goods. Almost all the policies tallied relate to banning the importation of older or less efficient vehicles.

In the case of 5 Caribbean countries, this measure is proposed as a means to reduce dependence on imported fuel. The fact that none of the Latin American countries mention this benefit highlights the economic motivations of the island countries, whose fuel import costs are some of the highest in the world.

## **B. Imposing new domestic standards**

This measure refers to the introduction of standards and labeling requirements for goods sold or used domestically. By the same logic given above, favoring newer and more highly standardized goods over older, less standardized substitutes is assumed to increase the average cost of goods in the product group, and contribute positively to short-term import expenditure.

Six of 17 Latin American countries and 10 of 16 Caribbean NDCs include commitments to new domestic standards, which by and large were efficiency standards for vehicles and durable goods such as refrigerators and air conditioning units.

## **C. Renewable energy development**

Latin America's energy mix is already relatively clean, thanks to the region's considerable hydropower capacity. Still, the energy sector contributed 43.5% of total greenhouse gas (GHG) emissions in 2018 (see figure A2). It is not surprising then that renewable energy development is the cornerstone of many of the region's NDCs. However, as most of the world's major renewable energy developers are based in advanced economies, Latin American countries have historically relied on foreign direct investment (FDI) to execute renewable energy projects—as of 2020, four of the five largest renewable energy developers active in Latin America were European (Smith, 2020). The components for solar, wind, and geothermal energy projects that are brought into the region from abroad via local subsidiaries or project developers are indeed imports, and as such, until Latin America's clean tech manufacturing sector converges with those of the United States, Europe, and East Asia, renewable energy development will continue to require substantial importation of manufactured goods.

Fifteen of 17 Latin American countries and 14 of 16 Caribbean NDCs include relevant commitments, making renewable energy development the most common and consequential import-side policy tallied in this section.

## **D. Reducing trade barriers for energy efficient imports**

This measure refers to the reduction or removal of tariff and non-tariff trade barriers, allowing specific environmental goods to enter the domestic market at a lower price. This policy is assumed to reduce overall import expenditure, particularly if demand for the goods in question is relatively inelastic.

Two of 17 Latin American countries and 6 of 16 Caribbean NDCs include commitments to reduce trade barriers for energy efficient imports. Guyana's NDC refers to benefits in the context of renewable energy adoption, noting that "legislation has been enacted to remove import duty and tax barriers for imports of renewable energy equipment, compact fluorescent lamps, and LED lamps to incentivize and motivate energy efficient behavior". St. Lucia, St. Vincent, and The Bahamas commit to reducing import duties for low-emitting vehicles. Cuba's NDC states that "the [US] blockade has imposed serious difficulties on Cuba to access the resources, technologies, equipment, and scientific and technical knowledge required for its sustainable development". And later, "in relation to access to suitable technologies for developing countries, it will be necessary for developed countries to remove trade barriers that affect these flows".

## **E. Reducing dependence on imported fuel**

Reducing dependence on imported fuel is a strong economic co-benefit of climate change mitigation in the region's energy sectors, with the potential to significantly reduce overall import expenditure.

None of the 17 Latin American countries and 6 of the 16 Caribbean NDCs mentioned the goal of reducing expenditure on imported fuel. As mentioned above, reducing dependence on imported fuel is particularly important to the island countries, where fuel costs are high.

## F. Technology transfers

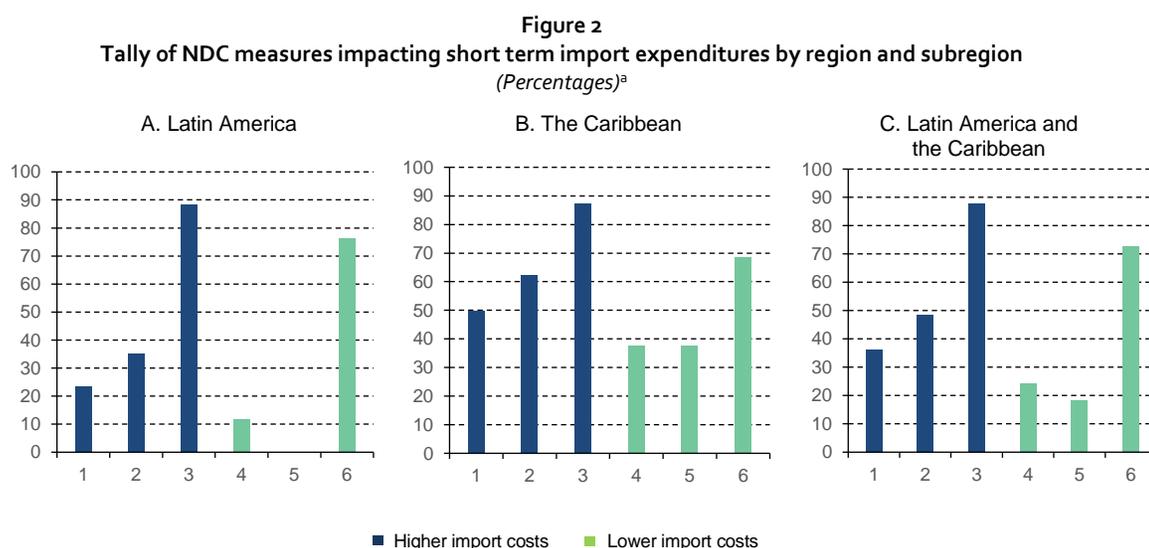
This measure refers to the transfer of technology and intellectual property from developed countries to developing countries. Technology transfer is encouraged by the UNFCCC, so references in the NDCs are often pro forma and short on details. However, in theory, technology transfers might allow Latin American and Caribbean manufacturers to produce more environmental goods domestically. If technology transfers did catalyze local clean technology manufacturing, LAC countries might be empowered to service a greater share of domestic demand, thus reducing expenditure on clean technology from abroad.

Thirteen of 17 Latin American countries and 11 of 16 Caribbean NDCs express interest in receiving technology transfers. Most countries cite their developing status and minimal contribution to climate change and request financial and technological assistance from the international community to help them meet some or all their emissions reduction goals.

**Table 1**  
Country tally of NDC measures impacting short-term import expenditure

1	2		3			4	5			6			
Block energy-inefficient imports	Impose new domestic standards		Renewable energy development			Reduce trade barriers for energy-efficient imports	Reduce dependence on imported fuel			Encourage technology transfers			
Latin America	1	2	3	4	5	6	Caribbean	1	2	3	4	5	6
Argentina	✓		✓			✓	Antigua	✓	✓	✓		✓	✓
Bolivia (Plurinational State of)			✓			✓	Bahamas	✓	✓	✓	✓	✓	✓
Brazil							Barbados	✓			✓		✓
Chile			✓			✓	Belize	✓	✓	✓			
Colombia	✓	✓	✓			✓	Cuba			✓	✓		✓
Costa Rica		✓	✓			✓	Dominica	✓	✓	✓		✓	✓
Ecuador			✓				Dominican Republic	✓	✓	✓	✓		✓
El Salvador		✓	✓	✓		✓	Grenada		✓	✓		✓	
Guatemala			✓			✓	Guyana		✓	✓	✓		
Honduras			✓			✓	Haiti	✓		✓		✓	✓
Mexico			✓			✓	Jamaica	✓					
Nicaragua			✓				St. Kitts			✓			✓
Panama		✓	✓			✓	St. Lucia			✓			✓
Paraguay	✓		✓	✓		✓	St. Vincent		✓	✓	✓	✓	✓
Peru							Suriname	✓	✓	✓			✓
Uruguay		✓	✓			✓	Trinidad			✓			
Venezuela (Bolivarian Republic of)	✓	✓	✓			✓							

Source: Nationally determined contributions accessed via UNFCCC online registry.



Source: Nationally determined contributions accessed via UNFCCC online registry.

Note: 1: Block energy-inefficient imports. 2: Impose new domestic standards. 3: Renewable energy development. 4: Reduce trade barriers for energy-efficient imports. 5: Reduce dependence on imported fuel. 6: Encourage technology transfers.

<sup>a</sup> Percentages indicate the share of all countries in the respective region or subregion that have included every type of measure in their NDCs.

## G. Tallies and takeaways

On the “increased import expenditure” side, banning the importation of old or energy inefficient goods was mentioned in 36% of the region’s NDCs; imposing new domestic standards was mentioned in 48% of NDCs; and renewable energy development was mentioned in 88% of NDCs. The first two measures might reasonably be expected to increase the average cost of goods such as vehicles and appliances, as these measures would lock out older, cheaper substitutes and push consumers toward newer, more expensive alternatives. Both measures were more common in the Caribbean, where higher medium-term fuel savings bring forward the payback timeline on products such as electric vehicles. The third measure, renewable energy development, is common across the region. Renewable energy technologies are needed to meet national emissions targets, and so it is not surprising that a large majority of the NDCs commit to scaling related infrastructure in the coming decade. While the region’s near-universal commitment to renewables is commendable, utility-scale developments will likely continue to be led by foreign firms and rely upon foreign-made components, contributing to short-term expenditure on imported manufactured goods. Establishing local clean technology sectors would require time, financing, and the development of a relatively specialized workforce. Furthermore, regional aspirants would be competing with well-established incumbents from the United States, Europe, and East Asia. Latin American clean energy entrepreneurs may yet find opportunities in other areas—for example, ECLAC believes that regional producers are primed to grab a share of the emergent green hydrogen market (ECLAC, 2021). But even then, the establishment of a substantial green hydrogen industry would be capital intensive and likely to contribute to import expenditure in the short to medium-term.

On the “reduced import expenditure” side, lowering barriers for energy efficient imports was mentioned in 24% of the NDCs; reducing dependence on imported fuel was mentioned in 18% of the NDCs; and requests for technology transfers were tallied in 73% of the NDCs. First, reducing trade barriers such as tariffs would bring down the cost of essential imports directly. This measure has the shortest time horizon of the three cost saving policies, as it can be achieved almost immediately so long as authorities are able to muster sufficient political will. Second, fuel savings, emphasized in several of the island countries’ NDCs, would bring down import expenditure increasingly over time. Pursuing this

measure, alongside the companion measures of blocking inefficient imports and imposing new domestic standards, is also a matter of political will. But it should be noted that even after the necessary legislation comes into force, it will still take time to phase out older machines and vehicles, so significant fuel savings are likely to lag policy implementation by several years.

Finally, technology transfers hold the potential to spur import substitution in theory but have proven quite difficult to execute. If a successful technology transfer is “one that does not only provide hardware to a recipient country, but also enables it to operate, maintain, replicate and innovate this technology” (Kircherr, 2018) then, according to all the literature surveyed (Kircherr, 2018; Ockwell, 2010; Unruh and Carrillo-Hermosilla, 2006; and Urmee and Harries, 2009), a large majority of these initiatives fail outright, usually due to insufficient financial, social, and human capital in the receiving country. Moreover, the technology and know-how shared with a receiving country is unlikely to be novel—for example, a large European energy firm might share standard photovoltaic technology but would be unlikely to share cutting edge green hydrogen technology for fear of encouraging meaningful competition. This reality limits the commercial upside and scalability of transfers even when they do occur.

Taken together, the six import-side measures imply substantial short-term expenditure on imported clean energy technology which is unlikely to be wholly offset by policies such as tariff reductions and technology transfers. As such, while the long-term economic and environmental benefits of the energy transition are undeniable, the import-side policies contained in the LAC NDCs also have the potential to contribute to trade deficits and spiraling debt obligations that would threaten their political viability during the early stages of implementation.



### III. Export side policies in the NDCs

This section will investigate NDC commitments impacting export revenue. Five of the 7 export categories surveyed are commodities: crops (vegetables, fruits, and cereals); livestock; forestry (timber yield from both native forests and commercial plantations); extractives (minerals, metals); and fishing. The remaining 2 export categories are non-commodity sectors: manufacturing and tourism. For each export category, measures in a country's NDC may be designated as contributing positively to export revenue, contributing negatively to export revenue, or both simultaneously. When an NDC commits to fully compensating producers for costs related to compliance with new environmental standards, the impact on export revenue will be considered neutral or ambiguous.

Commitments that are assumed to contribute positively to export revenue include the diffusion of productivity-enhancing technologies (e.g. irrigation or resilient tourism infrastructure) and resource management practices (e.g. protection of fish nurseries). Commitments that are assumed to contribute negatively to export revenue are primarily supply-side regulations that would raise production costs and / or limit the availability of inputs (e.g. enforcement of new industrial standards or direct restrictions on resource usage). Commitments to compensate producers are generally explicit (e.g. tax breaks tied to a specific activity), but can also be implicit, as when a country's emissions or land-use targets are fully conditioned upon international funding, as this designation implies that compensation would need to be made available to the party incurring implementation costs in order for the measure to be viable.

Commitments to reduce deforestation received a unique treatment, as they were assumed to directly impact not only the forestry sector but also the crop and livestock production sectors as well, given that most deforestation in the region is driven by farmers and ranchers clearing land for planting and grazing. In the case of Guyana specifically, gold mining was cited as the primary driver of deforestation, so extractive industry was assumed to be impacted by anti-deforestation measures in that country.

The treatment of energy initiatives requires a note here as well. Most NDCs focus heavily on reducing emissions by regulating the energy sector and/or encouraging the adoption of renewable energy technologies. The clean energy transition might be assumed to increase the cost of inputs in the short-term, particularly in the extractive and manufacturing industries. However, these impacts are diverse and

unpredictable. They also affect many sectors simultaneously and are occurring in many foreign markets at the same time, making implications for industrial export competitiveness particularly difficult to project. With this in mind, economy-wide energy initiatives are not taken as a new or unique input cost in this survey; the competitiveness of the manufacturing and extractive industries are only considered to have been impacted when specific energy and efficiency regulations are applied directly to these sectors.

## A. Crop production

Crop production is targeted by a high number of restrictions and regulations, mostly seeking to curtail extensive agricultural practices and reduce deforestation; 65% and 31% inclusion in Latin American and Caribbean NDCs respectively, and 48% overall. A smaller number of restrictions in both regions were explicitly or implicitly intended to have their costs offset by foreign funding.

Crop production was also the sector in which the largest number of NDCs committed to productivity and competitiveness enhancing measures. This survey tallied 82% and 50% inclusion of these measures in Latin American and Caribbean NDCs respectively, and 67% overall. Activities included diffusion of irrigation and fertilization technology, improvement of soil quality, and introduction of high-yield or diversified seed stock. The high level of support for crop production in the NDCs is likely driven by a combination of factors. First, the agricultural sector is highly vulnerable to changing weather patterns, making adaptation an immediate concern for producers. Second, UNFCCC guidelines explicitly encourage the parties to give special attention to food security in their NDCs, and many submissions focus on adaptive measures to that end. Third, enhancements in the agricultural sector, such as soil improvement programs, are cost-effective and easy to implement, making them something of a “low hanging fruit”.

Overall, the NDCs’ posture toward crop exports is moderately productivity and competitiveness enhancing. The parties make a strong commitment to protecting food supply and agricultural export revenue, while also addressing the sector’s contributions to soil degradation and deforestation.

## B. Livestock production

Livestock production is also targeted by a high number of restrictions and regulations: 71% and 31% inclusion in Latin American and Caribbean NDCs respectively, and 52% overall. Most of these measures are related to curtailing extensive ranching practices and reducing deforestation, while several others relate to the management of methane gas and manure.

At the same time, out of 7 sectors, livestock production was subject to the third highest number of productivity-enhancing measures in the NDCs: 59% and 25% inclusion in Latin American and Caribbean NDCs respectively, and 42% overall. Productivity-enhancing activities included programs to encourage intensive production, improve nutritional quality of cattle feed, and introduce meatier and more resilient breeding stock. Supporting livestock production is critical to sustaining both food security and export revenue from this sector, and like crop production, adaptive measures are encouraged by the UNFCCC.

Overall, the NDCs’ posture toward livestock exports is moderately productivity and competitiveness restricting. Efforts to combat extensive ranching practices are not equally met by commitments to support intensive production, and commitments to directly compensate producers for compliance with new regulations are likewise scarce. Factors contributing to the lower level of support for livestock versus crop production may include the sector’s lower degree of vulnerability to changing weather patterns, the higher cost and difficulty of implementing largescale intensification programs, and the somewhat lower proportion of regional export revenue derived from animal products.

## C. Forestry

Increasing forest cover is an overarching goal of many NDCs as forests represent important carbon sinks. This effort places constraints not only on crop and livestock production, but also legal and illegal commercial forestry. Forestry was the second most regulated sector in this survey, with restrictive measures included in 71% and 25% of Latin American and Caribbean NDCs respectively, and 48% overall. Several NDCs commit to participating in international anti-deforestation programs, through which they would receive compensation for protecting larger areas of native forest.

Productivity enhancements were also common in this sector, found in 65% and 25% of Latin American and Caribbean NDCs respectively, and 45% overall. Most of these measures relate to improving soil health, increasing resiliency of plantations, or deploying new monitoring technologies. Suriname offers a uniquely proactive policy, committing to developing more forward linkages and increasing value-add in timber products to boost export revenue.

Despite the support offered by governments and international organizations, the NDCs' posture toward the forestry sector is moderately productivity restricting. Almost no attention is given to the enormous mitigation potential of commercial afforestation (Forster et al, 2021), a phenomenon that is on display in Chile's negative land-use and land use change (LULUCF) emissions (see figure A3). While efforts to promote commercial afforestation may be pursued independently through national legislation, their absence from the NDCs is perhaps a missed opportunity to link environmental and economic goals.

## D. Extractive industry

The extractive industries are subject to surprisingly few direct restrictions in the region's NDCs, with qualifying measures identified in 18% and 6% of Latin American and Caribbean NDCs respectively, and 12% overall. These measures related to the electrification of machinery, regulations on black carbon (soot) and fugitive emissions, and regulations on deforestation driven by legal and illegal mining activities.

Argentina's is the only NDC to put forth a productivity enhancing policy in this sector, expressing support for strategic metals exploration. Metals like copper, lithium, and nickel are used intensively in renewable energy infrastructure, and the abundance of these metals in countries like Argentina, Bolivia, Chile, and Peru will be a boon to those countries' economies during the energy transition. However, mining these metals is capital and energy intensive, and destructive to the natural environment at the point of extraction, a reality which may have discouraged these countries from including more supportive rhetoric in their submissions.

Overall, the NDCs' posture toward the extractive industries is moderately productivity restricting, given that new regulations are not met in equal measure by compensation or productivity enhancements. In fact, the NDCs generally avoid addressing these industries altogether. It is possible that the economic importance of hydrocarbons, minerals, and metals, combined with the difficulty of extracting them in a sustainable manner, has discouraged governments from prioritizing mitigation efforts in these areas.

## E. Fisheries

The fisheries sector was targeted by relatively few new restrictions, with qualifying measures identified in 29% and 6% of Latin American and Caribbean NDCs respectively, and 18% overall. Most of these measures pertained to fishing quotas and new protections for coastal areas.

Productivity enhancements were identified in 18% and 31% of Latin American and Caribbean NDCs respectively, and 24% overall. The majority of enhancing measures were related to protecting hatcheries

in order to ensure adequate fishing stock from season to season. Restrictions outweighed enhancements in Latin American countries, while enhancements and compensated adaptation measures outweighed restrictions in the Caribbean, perhaps reflecting the importance of fisheries in Caribbean economies and aligning with the UNFCCC's special allowance for SIDS to focus on adaptation—in this case, the adaptation of coastal ecosystems—over mitigation of GHG emissions. Overall, the NDCs' posture toward fishing can be considered moderately productivity enhancing in the long term, though new coastal preserves and restrictions on overfishing might cut into revenue in the short term.

## F. Manufacturing

The manufacturing sector was targeted for new restrictions in a similar manner and in similar proportion to the extractive sector, with qualifying measures identified in 41% and 0% of Latin American and Caribbean NDCs, and 21% overall. These measures focused on energy efficiency requirements and regulation of black carbon (soot).

Measures supporting export revenue were identified in 12% and 6% of Latin American and Caribbean NDCs respectively, and 9% overall. All the measures tallied in this category related to the exportation of renewable energy—excess hydropower in Bolivia and Paraguay's NDCs, and geothermal in Dominica's. The commitment to boosting renewable energy production and exporting it into the power grids of neighboring countries is a forward-thinking model, and a unique example of aligning environmental and economic goals in the NDCs.

Surprisingly, the overall posture of the NDCs toward the manufacturing and industrial sectors is mixed, or perhaps even productivity enhancing, by virtue of the abovementioned plans to export clean energy. This measure also highlights the importance of integrating the region's energy grids. As renewable energy generation is intermittent, and energy storage technology remains prohibitively expensive, linking neighboring power grids to allow for the exportation and importation of surplus clean energy during peak hours represents a significant environmental and economic opportunity.

## G. Tourism

The tourism sector was targeted for new restrictions in only 1 Latin American country and none of the Caribbean countries for an overall inclusion rate of 3%, the lowest of any of the 7 export sectors.

Measures supporting tourism revenue were identified in 12% and 38% of Latin American and Caribbean NDCs respectively, and 24% overall. These measures mainly pertained to the protection or restoration of coastal resources important to the tourism industry, like beaches and reefs. In some cases, countries commit to investing in eco-tourism as an opportunity to move up the value chain.

The NDCs' posture toward tourism is moderately productivity and competitiveness enhancing. Caribbean countries focus much more strongly on the tourism sector, which is unsurprising given the central role of the tourism industry in their economies.

**Table 2**  
Country tally of NDC measures impacting short term export revenue

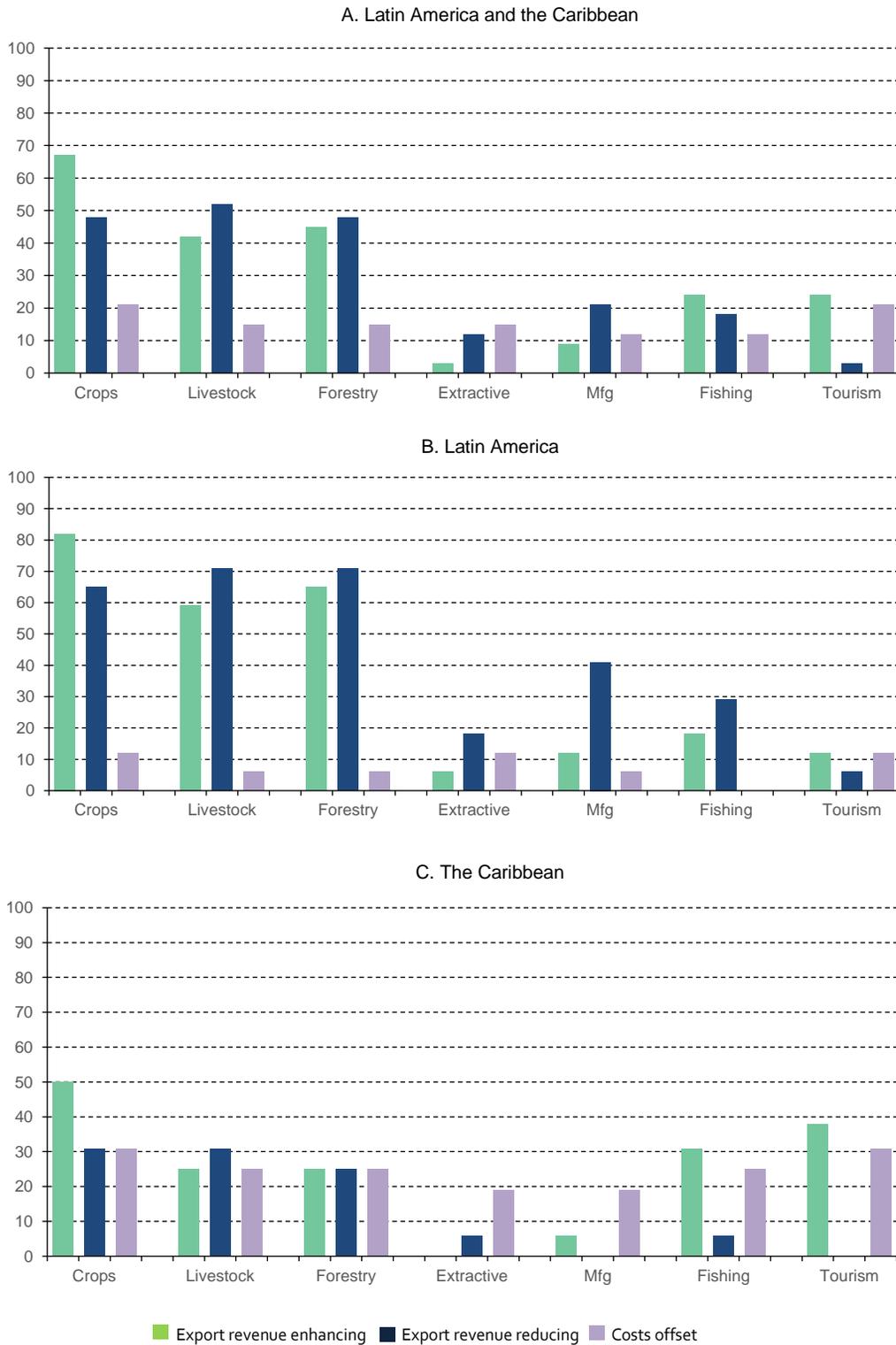
	Negative impact on export revenue (✓) or costs to producers require cost offset from Gov/IFIs (O)							Positive impact on export revenue (✓)						
	Crop	Live	For	Extr	Fish	Mfg	Tour	Crop	Live	For	Extr	Fish	Mfg	Tour
Latin America	-	-	-	-	-	-	-	+	+	+	+	+	+	+
Argentina	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓		
Bolivia (Plurinational State of)	✓	✓	✓					✓	✓	✓			✓	

Latin America	Negative impact on export revenue (✓) or costs to producers require cost offset from Gov/IFIs (O)							Positive impact on export revenue (✓)						
	Crop -	Live -	For -	Extr -	Fish -	Mfg -	Tour -	Crop +	Live +	For +	Extr +	Fish +	Mfg +	Tour +
Brazil														
Chile	✓	✓	O	✓	✓	✓	✓	✓	✓					
Colombia	✓	✓	✓	✓	✓	✓	O	✓	✓	✓				
Costa Rica	✓	✓	✓	✓	✓	✓		✓		✓		✓		
Ecuador	✓	✓	✓			✓		✓	✓	✓				
El Salvador	✓	✓	✓					✓	✓	✓				
Guatemala	✓	✓	✓	O		O		✓	✓	✓				
Honduras	O	✓	✓											
Mexico	✓	✓	✓			✓		✓		✓				
Nicaragua	✓	✓	✓			✓		✓		✓				
Panama	O	O	✓		✓			✓	✓	✓		✓		✓
Paraguay	✓	✓	✓					✓		✓			✓	✓
Peru														
Uruguay							O	✓	✓					
Venezuela (Bolivarian Republic of)				O				✓	✓					
<b>The Caribbean</b>														
Antigua	O				O		O	✓	✓					
Bahamas												✓		✓
Barbados														
Belize	O	O	O		O		O					✓		
Cuba		O												
Dominica	O	O	O		O	O	O	✓	✓				✓	✓
Dominican Republic	O	O	O	O	O	O	O	✓		✓				✓
Grenada														
Guyana	✓	✓	O	O										
Haiti	✓	✓	✓		✓			✓	✓	✓		✓		
Jamaica	✓	✓	✓					✓		✓				
St. Kitts								✓	✓			✓		✓
St. Lucia	O						O							
St. Vincent	✓	✓	✓					✓				✓		✓
Suriname	✓	✓	✓	✓				✓		✓				✓
Trinidad				O		O								

Source: Nationally determined contributions, accessed via UNFCCC online registry.

Note: Crop: Crop production. Live: Livestock production. For: Forestry. Extr: Extractive industry. Fish: Fisheries. Mfg: Manufacturing. Tour: Tourism.

**Figure 3**  
**Sectoral tally of NDC measures impacting short term export revenue by region and subregion**  
*(Percentages)*



Source: Nationally determined contributions, accessed via UNFCCC online registry.

## H. Tally and takeaways

The commodity exporting sectors —crop production, livestock production, forestry, extractive industries, and fishing— were targeted with restrictive measures 51% of the time in Latin American NDCs, 20% of the time in Caribbean NDCs, and 35% of the time across all NDCs, on average. The intraregional disparity can be partly explained by the higher proportion of compensated measures in the Caribbean countries' commodity sectors. These countries specified that investments in commodity sector adaptations would be offset by public or international financing 25% of the time on average, compared to the Latin American countries' 7%. In these cases, commodity export revenue was considered unaffected, given that producers would not be expected to shoulder new costs. Leaving aside the difference in tallies of non-compensated versus compensated measures, the proportions of new commodity sector regulations were otherwise similar between the two sub-regions. Crop production, livestock production, and forestry were targeted frequently in both sub-regions due to the NDCs' strong focus on reducing deforestation. Extractive industries were targeted at a much lower rate in both sub-regions. The lower number of restrictive measures identified in extractive industries is partly a function of this survey's methodology, which exempted this sector from the costs associated with anti-deforestation policies due to the often (but not always) subterranean or offshore nature of mining and drilling activities.<sup>2</sup> But even accounting for possible methodological distortions, extractive industries went largely unmentioned in the NDCs, perhaps due to their strategic or political importance, or the high costs and technical barriers associated with regulating them. Fishing was also targeted less frequently than land-based agriculture in both sub-regions, as it does not contribute to emissions related to land use and is not affected by regulations seeking to limit deforestation.

Among the non-commodity sectors, there was a noticeable disparity between sub-regions in the number of new restrictions for the manufacturing sector, which was targeted 41% of the time in Latin American NDCs and not at all in the Caribbean, likely because the manufacturing sectors of most Caribbean countries are quite small and their contributions to both GHG emissions and economic activity are negligible. The 21% overall inclusion rate of restrictions in this sector was lower than the 34% average for the commodity sectors. Meanwhile, tourism was almost entirely exempt from uncompensated regulations in both sub-regions, and the 3% overall inclusion rate of new restrictions in this sector was the lowest of the 7 sectors surveyed.

The five commodity sectors were the beneficiaries of productivity enhancing measures 46% of the time in Latin American NDCs, 26% of the time in Caribbean NDCs, and 36% of the time across all NDCs, on average. The overall inclusion rate was buoyed by the strong defense of food security in Latin American NDCs, 82% of which included measures aimed at boosting crop production. This sector was also the most heavily supported in the Caribbean NDCs, though the inclusion rate was significantly lower than Latin America's, at 50%. One explanation for Latin American countries' higher level of support for commodity exports is that these sectors are more relevant in Latin America than they are in the Caribbean, where land and resources are relatively scarce. The exception that proves the rule is the fisheries sector, the one commodity sector where Caribbean countries offered more outright productivity enhancements than Latin American countries did. Considering that fishing supports a higher proportion of livelihoods in the islands than in Latin America, the Caribbean countries' outsized patronage of this sector points to a tendency to align positive measures with comparative advantages.

Among the non-commodity sectors, manufacturing received little support in either sub-region, while tourism received relatively strong support in the Caribbean NDCs but not the Latin American

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<sup>2</sup> According to Mining Technology, mines have driven approximately 7% of deforestation globally. Latin American mines typically have a lower impact on forests than those in Asia and Africa, with mines in the Brazilian Amazon being a notable exception. Given that Brazil's updated NDC has removed commitments to reducing deforestation, it was not necessary to tally the impact those measures might have on the extractive sector in that country.

NDCs (38% versus 12%). Given that tourism is one of the Caribbean islands' most important sources of export revenue, this disparity again suggests that governments sought to align positive measures with comparative advantages.

Taken together, the region's NDCs have done well to balance new regulations with measures intended to enhance productivity and competitiveness. Across all NDCs and all 5 commodity sectors, restrictive measures were identified 36% of the time and enhancements were identified 36% of the time as well. In the remaining two non-commodity sectors, restrictive measures were identified 12% of the time, and enhancements were identified 17% of the time. While it is beyond the scope of this paper to attempt to quantify the net trade effects of all the measures tallied, it is still possible to outline when and how costs and benefits of these policies might be incurred.

On the regulatory side, the tone of the NDCs, and of leaders and international organizations more broadly, is quite urgent —rightly so, given the environmental challenges the world is facing. If we assume that the new regulations outlined in the NDCs are to be legislated in the near-term then compliance costs to producers will be felt more or less immediately. Meanwhile, productivity-enhancing measures may be initiated along the same timeline but benefits to producers are likely to accrue more slowly and may encounter bureaucratic or technological implementation barriers. Programs like improving soil quality, breeding meatier livestock, interconnecting power grids to export clean energy, and marketing a nascent eco-tourism industry all require upfront resources, efficient and coordinated deployment efforts, and time to mature. Any implementation gap, temporal or otherwise, between the introduction of new environmental regulations (e.g. restrictions on the creation of new farm or pastureland) and the rollout and maturation of productivity enhancements (e.g. intensification of crop and livestock production) is likely to result in a drop in both output and cost competitiveness of these commodities on global markets.

## IV. Conclusions and recommendations

In Latin America and the Caribbean, where raw materials exports help to finance capital goods imports, NDC commitments are likely to negatively impact the balance of payments, especially at the outset of the energy transition. Purchases of renewable energy hardware and electric vehicles from abroad will drive up import expenditure, while restrictions on land use will generate new costs to producers, potentially pushing down export earnings.

As illustrated in figure 1 of this paper, only Uruguay, Costa Rica, Colombia, Chile, Mexico, Peru, Brazil, Ecuador, and Venezuela enjoyed a combined surplus on the trade of raw materials and capital goods in 2018. These economies will have an easier time weathering the short-term trade effects of climate change mitigation. Those with deposits of strategic metals —Chile, Peru, Argentina— and those with robust manufacturing sectors —Mexico, Brazil, and Argentina— may even find ways to benefit from the transition by integrating more fully into clean technology supply chains. Considering their strong economies and trade balances, it is encouraging to see that the majority of these same countries have also committed to a number of unconditional mitigation efforts in their NDCs—Brazil and Venezuela being the notable exception.

At the other end of the spectrum are smaller economies with very large gaps between expenditure on capital goods and revenue from raw materials exports. Most of the countries in this category are found in the Caribbean. While these countries are indeed vulnerable to rising import costs, large-scale climate change mitigation may not be as economically destabilizing as it would first appear. There are three important caveats to remember for the Caribbean countries specifically. First, a large portion of their export revenue comes from services like tourism and finance, not reflected in figure 1, which help them to close the deficit in the trade of goods. Second, given the high price of imported fuel in the island countries, the payback timeline on renewable energy and efficiency investments is likely to be much shorter than in mainland Latin America. And third, as small island developing states (SIDS), international financial support for Caribbean adaptation and mitigation measures is codified in the Paris Agreement; from the tally in table 2, it is apparent that well over half of the restrictive export-side measures found in Caribbean NDCs would need to be funded by international donors, though

unconditional commitments from countries like Guyana, Haiti, Jamaica, St. Vincent, and Suriname may leave these countries exposed to new costs.

Between the region's largest and/or most diversified economies and the smaller but more explicitly supported Caribbean economies are several medium-sized LAC economies that already run combined deficits on raw materials and capital goods but lack both the Caribbean countries' substantial service sector income and their special status under the Paris Agreement. Countries in this category include El Salvador, Guatemala, Nicaragua, Honduras, and Paraguay —exempt only by virtue of its robust service sectors is Panama (finance and shipping). Among this group of mostly Central American countries, only Guatemala's NDC is partially conditional, leaving El Salvador, Nicaragua, Honduras, and Paraguay to join Guyana, Haiti, Jamaica, St. Vincent, and Suriname as the countries whose balance on traded goods is most vulnerable to a short-term deterioration driven by climate change mitigation activities.

To minimize impact on the current account, all LAC countries, and especially the most vulnerable, should focus on shortening the payback timeline of their investments in climate change mitigation. In addition to seeking international project finance and so-called debt-for-climate swaps to defray investment costs, LAC governments should also increase their focus on productivity enhancements to support the output and cost competitiveness of critical exports. By investing in crop and livestock intensification, commercial afforestation, aquaculture, and both mining and refinement of strategic metals, LAC governments can help exporters not only meet but surpass the costs of new restrictions on domestic resource usage. Ideally, programs should be implemented in advance of, or at least alongside, phased-in restrictions so that they may accrue near-term benefits sufficient to offset new production costs. Such policies might allow LAC economies to limit trade imbalances and their knock-on effects in financial markets and the real economy. By demonstrating the economic viability of climate commitments, LAC governments can secure the political capital necessary to ensure full implementation of the programs outlined in their NDCs, and place their countries on the path to robust and environmentally sustainable growth in the aftermath of the COVID-19 pandemic.

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## **Annexes**

## Annex 1

## Latin America and the Caribbean's emissions profile

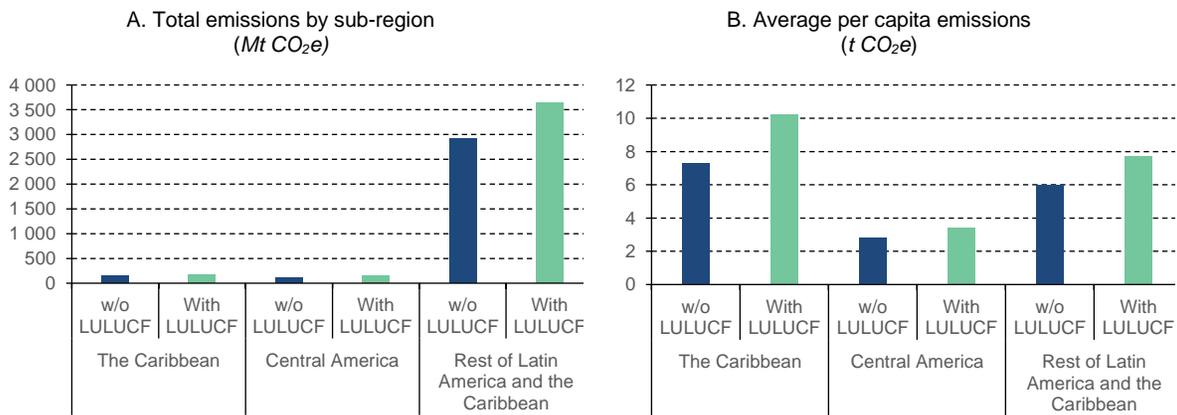
Table A1  
Country emissions: total and per capita rankings, 2018

	Total CO <sub>2</sub> e emissions with LULUCF (Mt CO <sub>2</sub> e)	Share of LAC total (percentages)	Rank	Per capita CO <sub>2</sub> e emissions with LULUCF (t CO <sub>2</sub> e)	Rank	Total CO <sub>2</sub> e emissions w/o LULUCF (Mt CO <sub>2</sub> e)	Share of LAC total (percentages)	Rank	Per capita CO <sub>2</sub> e emissions w/o LULUCF (t CO <sub>2</sub> e)	Rank
Brazil	1 420.6	35.8	1	6.8	15	1 032.6	32.5	1	4.9	16
Mexico	695.3	17.5	2	5.5	18	679.9	21.4	2	5.4	14
Argentina	395.5	10.0	3	8.9	12	365.7	11.5	3	8.2	6
Venezuela (Bolivarian Republic of)	277.3	7.0	4	9.6	11	233.9	7.4	4	8.1	7
Colombia	268.0	6.8	5	5.4	19	184.1	5.8	5	3.7	21
Peru	186.2	4.7	6	5.8	17	96.3	3.0	7	3.0	28
Bolivia (Plurinational State of)	126.2	3.2	7	11.1	9	56.9	1.8	9	5.0	15
Paraguay	95.3	2.4	8	13.7	6	49.2	1.5	10	7.1	8
Ecuador	91.8	2.3	9	5.4	20	65.7	2.1	8	3.8	20
Chile	51.8	1.3	10	2.8	29	109.6	3.4	6	5.9	13
Cuba	38.8	1.0	11	3.4	24	41.9	1.3	11	3.7	22
Guatemala	38.7	1.0	12	2.4	30	35.4	1.1	14	2.2	31
Nicaragua	38.7	1.0	13	6.0	16	19.1	0.6	17	3.0	29
Dominican Republic	37.5	0.9	14	3.5	22	39.1	1.2	12	3.7	23
Uruguay	34.4	0.9	15	10.0	10	36.2	1.1	13	10.5	5
Honduras	28.1	0.7	16	2.9	28	22.4	0.7	16	2.3	30
Trinidad and Tobago	23.0	0.6	17	16.6	5	22.9	0.7	15	16.5	2
Panama	22.4	0.6	18	5.4	21	18.0	0.6	18	4.3	17
Guyana	19.1	0.5	19	24.6	1	5.0	0.2	23	6.5	12
El Salvador	13.4	0.3	20	2.1	31	12.4	0.4	20	1.9	32
Suriname	13.2	0.3	21	22.8	2	3.8	0.1	25	6.6	11
Haiti	10.6	0.3	22	1.0	33	9.9	0.3	22	0.9	33
Jamaica	10.2	0.3	23	3.5	23	10.0	0.3	21	3.4	24
Costa Rica	8.5	0.2	24	1.7	32	15.8	0.5	19	3.2	27
Belize	6.8	0.2	25	17.8	4	1.6	0.0	28	4.1	18
Barbados	3.8	0.1	26	13.2	7	3.8	0.1	24	13.2	3
Bahamas	2.7	0.1	27	6.9	14	2.6	0.1	26	6.9	10
Grenada	2.4	0.1	28	21.1	3	2.4	0.1	27	21.1	1
Antigua	1.2	0.0	29	12.6	8	1.2	0.0	29	12.6	4
St. Lucia	0.6	0.0	30	3.3	26	0.7	0.0	30	4.1	19
St. Kitts	0.4	0.0	31	7.0	13	0.4	0.0	31	7.0	9

	Total CO <sub>2</sub> e emissions with LULUCF (Mt CO <sub>2</sub> e)	Share of LAC total (percentages)	Rank	Per capita CO <sub>2</sub> e emissions with LULUCF (t CO <sub>2</sub> e)	Rank	Total CO <sub>2</sub> e emissions w/o LULUCF (Mt CO <sub>2</sub> e)	Share of LAC total (percentages)	Rank	Per capita CO <sub>2</sub> e emissions w/o LULUCF (t CO <sub>2</sub> e)	Rank
St. Vincent	0.4	0.0	32	3.3	25	0.4	0.0	32	3.3	26
Dominica	0.2	0.0	33	3.2	27	0.2	0.0	33	3.4	25

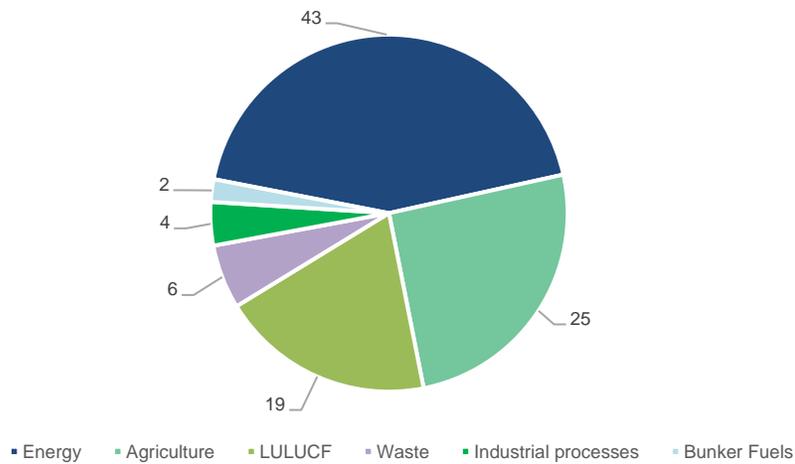
Source: Climate Watch and author's calculations.

**Figure A1**  
Sub-regional emissions: total and per capita, 2018



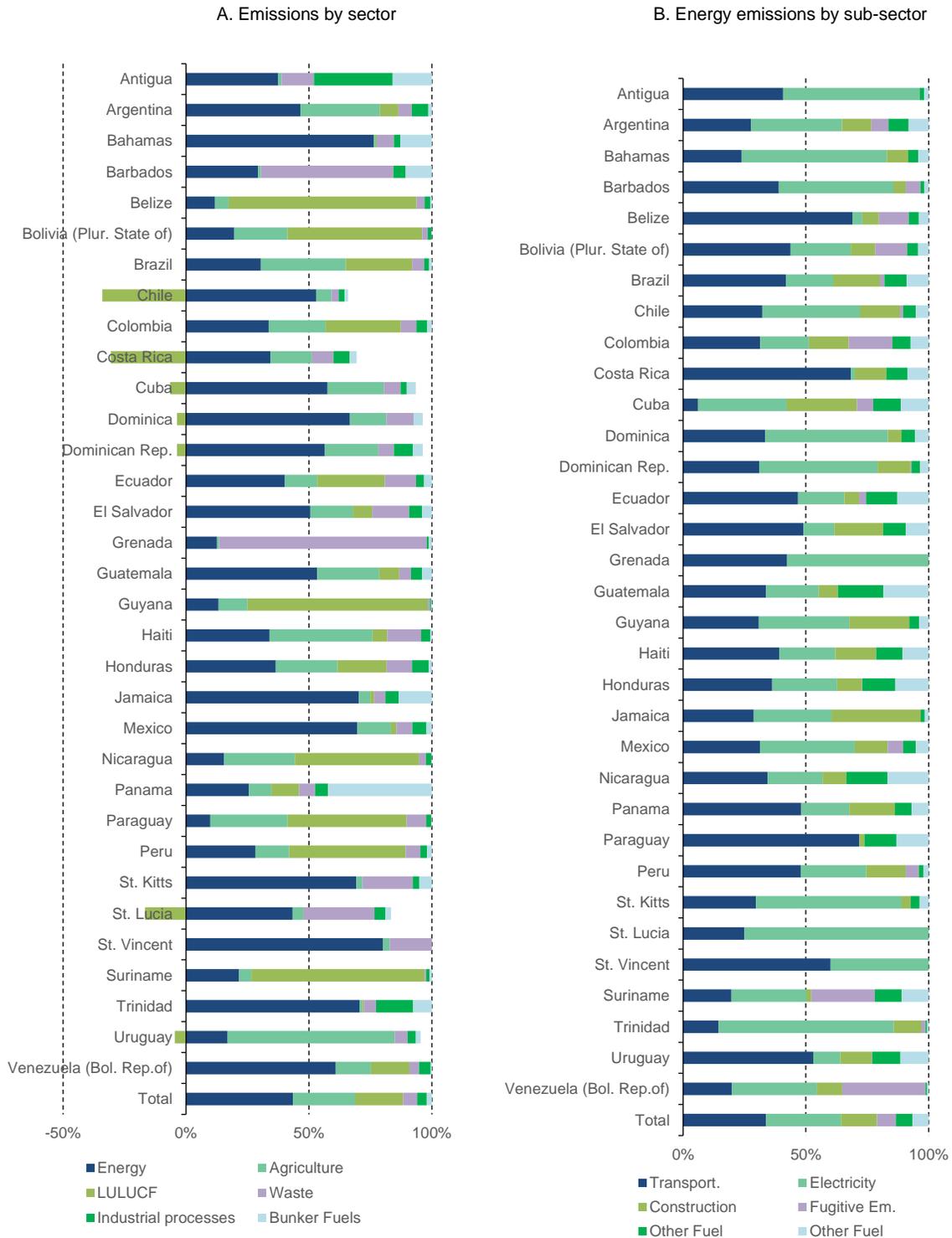
Source: Climate Watch and author's calculations.

**Figure A2**  
Latin America and the Caribbean's emissions by sector, 2018  
(Percent of total)



Source: Climate Watch and author's calculations.

**Figure A3**  
**Country emissions by sector, 2018**  
*(Mt CO<sub>2</sub>e)*



Source: Climate Watch and author's calculations.

## Annex 2

**Table A.2**  
**NDC summaries by country**

Antigua and Barbuda (version 2)	Unconditional Emissions Target	N/A
	Conditional Emissions Target	N/A
	Additional Content	By 2030, 100% of electricity demand in the water sector and other essential services (including health, food storage and emergency services) will be met through off-grid renewable sources to enhance resilience to drought and hurricanes. 86% renewable energy generation from local resources in the electricity sector by 2030.
	Export Implications	Antigua and Barbuda's NDC focuses on compensating exporters for adaptation and mitigation, primarily using a subsidized insurance scheme for farmers, fishers, and business owners, including those in the tourism sector.
Argentina (version 3)	Unconditional Emissions Target	Argentina's latest submission sets an unconditional goal of limiting greenhouse gas emissions to 359 MtCO <sub>2</sub> e in 2030 including LULUCF (estimated by Climate Action Tracker to be 313 MtCO <sub>2</sub> e excl. LULUCF). This new target is 26% below Argentina's previous NDC target, which provided an unconditional target limiting 2030 emissions to 422 MtCO <sub>2</sub> e (excl. LULUCF).
	Conditional Emissions Target	N/A
	Additional Content	Long-term commitment to carbon neutrality by 2050.
	Export Implications	Argentina's NDC outlines restrictions on land use and emissions which may represent costs to exporters. However, it also commits to providing material support for the intensification of agriculture and ranching, the dissemination of planning technology for the commercial forestry sector, exploration for strategic metals used in clean energy technology, and the strengthening of sustainable fishing.
Bahamas (version 1)	Unconditional Emissions Target	N/A
	Conditional Emissions Target	30% reduction of GHG emissions relative to BAU by 2030; "the cost of implementation is anticipated to be met through multilateral and bilateral support from a variety of sources".
	Additional Content	The Bahamas' NDC is very preliminary. It highlights impacts on coastline and the tourism industry, which generates a large portion of the country's GDP, and signals an intention to address these threats and others with the help of international financing. Conditional mitigation efforts will focus on reducing emissions from the transportation and electricity sectors, and the Bahamas sets a goal of 30% renewable energy in the electricity mix by 2030.
	Export Implications	The Bahamas states its intention to use prospective international financing to protect resources and improve critical infrastructure in the agricultural, fishing, and tourism industries.
Barbados (version 2)	Unconditional Emissions Target	30% reduction in emissions relative to BAU by 2030.
	Conditional Emissions Target	70% reduction in emissions relative to BAU by 2030, conditioned upon international support.
	Additional Content	Additional conditional goals for 2030: 95% share of renewable energy in the electricity mix, 100% electric or alternatively-fueled vehicles in the passenger fleet, 20% increase in energy efficiency across all sectors as compared to BAU, 29% decrease in industrial, commercial and residential fuel consumption as compared to BAU, and 20% decrease in waste emissions.
	Export Implications	While Barbados's NDC contains emissions goals and also refers to previously enacted legislation that has put the country on a path toward greening tourism, there are no measures detailed in the NDC that could reasonably be assumed to impact the productivity or competitiveness of the tourism sector or other export sectors.
Belize (version 2)	Unconditional Emissions Target	N/A
	Conditional Emissions Target	N/A
	Additional Content	In its updated NDC, Belize does not commit to economy-wide emissions reductions, but it does include sectoral emissions and mitigation targets, notably the avoidance of 63% of baseline emissions from the Agriculture, Forestry and Other Land Use (AFOLU) sector and an increase to 75% of renewable energy in electricity generation between 2021 and 2030.
	Export Implications	Belize's NDC introduces restrictions on use of forest land and coastal resources. These restrictions are met with improvements to crop resilience, livestock husbandry practices, forest management, and tourism infrastructure, as well as new protections for fish hatcheries.

Bolivia (version 2)	Unconditional Emissions Target	N/A
	Conditional Emissions Target	N/A
	Additional Content	In its second NDC, Bolivia does not commit to economy-wide emissions reductions, but sets targets for the use of renewable energy and adoption of energy efficient technologies in the public sector.
Export Implications		Bolivia's NDC focuses strongly on reducing deforestation, a potential short-term cost for farmers, ranchers, and the forestry sector. However, costs are intended to be partially covered by international assistance. Additionally, the NDC update includes export support related to forest products as well, including commitments to double the output of non-timber forest products, such as nuts, by 2030. In the agriculture and water sectors, the NDC commits to increasing coverage of sustainable irrigation systems, recovering degraded lands, and dramatically boosting the production and yield of strategic crops by improving institutions and financial access and disseminating new agricultural technology.
Brazil (version 3)	Unconditional Emissions Target	37% GHG emissions reduction over base year 2005 by 2025, 43% reduction over 2005 by 2030.
	Conditional Emissions Target	Net zero by 2050.
	Additional Content	While Brazil's NDC update of 2022 increases the 2030 emissions reduction target from 37% to 50%, it removes all mention of anti-deforestation measures present in the first NDC.
Export Implications		Brazil has removed mention of anti-deforestation measures from its updated NDC, so any cost implications for exporters are not made explicit.
Chile (version 2)	Unconditional Emissions Target	Absolute target of 95 MtCO <sub>2e</sub> in 2030, excl. emissions or removals from the Land Use, Land Use Change and Forestry (LULUCF) sector; GHG emissions budget of 1,100 MtCO <sub>2e</sub> between 2020 and 2030; peak year for GHG emissions is 2025.
	Conditional Emissions Target	Reduction of up to 45% net GHG emissions including LULUCF from 2016 levels, by 2030. Depending on the expected contribution of the LULUCF sector for this target, this target could reduce emissions excluding LULUCF to between 95 MtCO <sub>2e</sub> and 88 MtCO <sub>2e</sub> .
	Additional Content	Chile commits to reducing the energy consumption forecast by 20% by 2025, increasing the use of "non-conventional" renewables to 20% by 2025, and employing sustainable management practices in 100,000 hectares of forest.
Export Implications		Chile's NDC outlines various land use restrictions, coupled with agricultural enhancements, and means of compensating producers in the forestry sector. It also puts forth new standards for industrial issuers of black carbon and short-lived pollutants, and new goals for electrification of heavy machinery, all of which likely represent costs to producers.
Colombia (version 2)	Unconditional Emissions Target	Colombia increased its mitigation goal to an absolute emissions limit of 165 Mt CO <sub>2e</sub> including LULUCF in 2030, equivalent to 51% emissions reduction compared to a business as usual (BAU), including LULUCF. The update is more ambitious than Colombia's initial NDC, which pledged an unconditional emissions reduction of 20% and a conditional emissions reduction of 30% compared to BAU by 2030.
	Conditional Emissions Target	N/A
	Additional Content	The updated NDC focuses heavily on LULUCF, with land-use based mitigation accounting for 70% of GHG emissions reductions targeted in the document.
Export Implications		Colombia's commitment to combat deforestation is likely to restrict agricultural activities. Otherwise, while adaptation measures are mentioned in various sectors, nothing specifically productivity enhancing is outlined with regard to tourism, fisheries, etc. Notably, mining and petroleum —major industries in Colombia— are not addressed in a serious way.
Costa Rica (version 3)	Unconditional Emissions Target	Maximum net emissions of 9.11 MtCO <sub>2e</sub> in 2030 incl LULUCF (106.53 cumulative emissions budget 2021 to 2030).
	Conditional Emissions Target	N/A
	Additional Content	Full reliance on renewable energy sources by 2030.
Export Implications		New restrictions and standards for most export sectors (agriculture, livestock production, forestry, manufacturing, and extractive industries). However, the NDC also references soil improvements, content requirements for buildings to include sustainably sourced domestic timber, and incentives for sustainable and traditional fishing methods that should help to defray the new costs of compliance.

Cuba (version 2)	Unconditional Emissions Target	N/A
	Conditional Emissions Target	N/A
	Additional Content	Generate 24% of electricity from renewable sources by 2030, to avoid the emission of an estimated 30.6 million kilotons of carbon dioxide equivalent (ktCO <sub>2</sub> e); increase energy efficiency in commercial, institutional, residential, and agriculture sectors, to avoid the emission of an estimated 700,000 ktCO <sub>2</sub> e; and reduce carbon-intensive ground transportation, to avoid the emission of an estimated one million ktCO <sub>2</sub> e annually, by cutting fossil fuel consumption in vehicles by 50% by 2030.
Export Implications	Cuba's NDC commits to limiting emissions in the swine industry specifically. All of the country's commitments are conditioned upon international assistance, implying that efficiency measures would be fully compensated and any impact on livestock exports would be neutralized.	
Dominica (version 2)	Unconditional Emissions Target	N/A
	Conditional Emissions Target	45% GHG emissions reduction over 2014 levels by 2030, broken down by sector: 98.6% reduction in energy sector, 78.6% reduction in solid waste sector, 16.9% reduction in transport, 8.8% in manufacturing, and 8.1% in agriculture. Meeting targets is dependent on international financing and technology transfer.
	Additional Content	The NDC states a goal of 100% renewable energy usage by 2030.
	Export Implications	Dominica's NDC is unique in its emphasis on exports. The NDC outlines plans to attract eco-tourists, develop local green ammonia and hydrogen production, and transmit surplus geothermal energy to neighboring islands via undersea cable. The NDC also promotes food security through internationally funded improvements to farms and fisheries. Improvements to forestry management and industrial efficiency are also possible, depending on the level of international assistance.
Dominican Republic (version 2)	Unconditional Emissions Target	N/A
	Conditional Emissions Target	27% reduction of GHG emissions over 2010 levels by 2030, conditioned upon financing and other forms of support.
	Additional Content	
	Export Implications	The Dominican Republic's new NDC offers various plans for productivity enhancement. In the agricultural sector, the NDC mentions sustainable soil management (conservation, precision, organic agriculture, etc.), promotion of efficient irrigation systems, and promotion of diversity and resilience of agricultural crops. In the forestry sector, the NDC mentions afforestation / reforestation, promotion of the ecosystem approach in the adaptation of forests to climate change, promotion of agroforestry and silvopastoral practices, and sustainable management of forests and ecosystem services. And in the livestock sector, the NDC mentions using organic matter to restore degraded pastures.
Ecuador (version 1)	Unconditional Emissions Target	25% reduction in energy sector emissions relative to BAU scenario; in 2010 the energy sector accounted for approximately 50% of emissions, so a 25% sectoral reduction represents an approximately 12.5% reduction economy wide.
	Conditional Emissions Target	40% reduction of emissions in the energy sector possible with international help.
	Additional Content	Ecuador aims to achieve 90% clean energy from hydropower by 2017, replace the use of diesel in rural areas with the use of gas, restore 500,000 hectares of forest until 2017 and 100,000 per year from 2017 to 2025, while achieving a 0% rate of deforestation. Like Bolivia, Ecuador centralizes the concept of <i>buena vivir</i> which also holds a place in the country's constitution.
	Export Implications	Ecuador's NDC expresses a range of restricting and enhancing measures related to land use and agriculture. The NDC also commits to reducing emissions from the production of concrete, tallied here as a restricting measure in the manufacturing industry sector.
El Salvador (version 3)	Unconditional Emissions Target	N/A
	Conditional Emissions Target	Reduce annual GHG emissions by 61%, relative to 2019 baseline, by 2030. This target is conditional upon the installation of a carbon capture facility, itself requiring a "financing structure that makes its construction feasible".
	Additional Content	El Salvador's updated NDC is significantly more detailed than the original and includes commitments to increase renewable energy usage in various sectors of the economy, and to work with customs officials and other regulators to facilitate the importation of more efficient refrigerators and air conditioning units.
	Export Implications	In addition to renewable energy adoption, the NDC details policies aimed at reducing forest and farmland degradation and transitioning to low-carbon production of crops and livestock. Some of these measures are purely restrictive, and others are intended to increase production in export sectors through the use of mechanization and high-yield seed stock, and by enhancing soil quality.

Grenada (version 2)	Unconditional Emissions Target	N/A
	Conditional Emissions Target	40% reduction of GHG emissions below 2010 levels by 2030, to be implemented with bilateral and multilateral funding support.
	Additional Content	
	Export Implications	Grenada's latest NDC seems to have removed mentions of measures to be taken in specific areas like forestry and tourism, and the NDC no longer contains any discernable implications for export competitiveness.
Guatemala (version 3)	Unconditional Emissions Target	11.2% reduction of GHG over 2005 levels by 2030 from changes in LULUCF.
	Conditional Emissions Target	Additional 11.4% reduction, for a total of 22.6%, possible with international assistance (economy wide).
	Additional Content	Guatemala's latest NDC has expanded significantly upon prior submissions, and now offers detailed proposals across all sectors of the economy, from renewable energy development to agriculture and timber production.
	Export Implications	Guatemala's NDC commits to several anti-deforestation measures that would be partly compensated by an incentive program, in addition to resiliency and water management programs in the agricultural sector that would be assumed to enhance productivity. Forest plantations are proposed as a means to reduce deforestation without impacting timber production. Another incentive program seeks to lower emissions from industrial production.
Guyana (version 1)	Unconditional Emissions Target	N/A
	Conditional Emissions Target	N/A
	Additional Content	Guyana is a unique country, one of the world's only net carbon sinks due to its tiny population and 85% rainforest coverage. It has also entered into a one-of-a-kind agreement with Norway, which gives Guyana \$30 million per year to refrain from undertaking development projects that would threaten its rainforest. Guyana's NDC notes that with international assistance, it can achieve 100% renewable energy by 2025. It also commits to stronger monitoring and management of forests and restriction of small scale gold mining, which was responsible for 89% of deforestation recently recorded.
	Export Implications	Guyana's NDC restricts deforestation, with negative productive implications for agriculture, forestry, and in this case, extractive industry, specifically gold mining. It also commits to enhancing value of timber products and implementing programs to reduce the impact of mining practices in an effort to maintain output without threatening protected forest areas. However, similar programs and commitments of compensation are not guaranteed for farmers and ranchers.
Haiti (version 2)	Unconditional Emissions Target	6.32% reduction of GHG emissions over 2000 levels.
	Conditional Emissions Target	25.5% reduction over baseline.
	Additional Content	Haiti's NDC update is relatively detailed and includes commitments to renewable energy development, and also to trade-related measures such as restricting imports of used cars.
	Export Implications	Haiti's NDC makes unconditional commitments to reduce deforestation and add new restrictions on fishing. It also commits to makes commitments to improve crop productivity using new technology, improve livestock productivity by introducing new food sources, increase timber production by expanding commercial forestry areas, and increase productivity of fisheries by improving management practices.
Honduras (version 2)	Unconditional Emissions Target	16% reduction relative to BAU by 2030 (economy wide, except LULUCF).
	Conditional Emissions Target	N/A
	Additional Content	Honduras's NDC commits to reforestation of 1.3 million hectares by 2030 and reduction of firewood consumption by 39%.
	Export Implications	Honduras's NDC commits to reducing deforestation. It also commits to incentives in the crop production sector to hasten the conversion to sustainable farming practices, but similar measures are not mentioned for livestock and forestry.

Jamaica (version 2)	Unconditional Emissions Target	The second NDC does not express an overall emissions reduction goal, but rather a 25.4% unconditional reduction from the LULUCF and energy sectors specifically.
	Conditional Emissions Target	In the second NDC, a 28.5% reduction of emissions in the LULUCF and energy sectors is considered possible with international support.
	Additional Content	Highlights SIDS status, along with importance of coastal preservation and protection of the tourism industry. Additional goal of 20% renewable energy in electricity mix by 2030. The second NDC incorporates much more land use content than the first submission.
	Export Implications	The second NDC's has a strong land use focus and commits to reducing deforestation. It also offers enhancements in agricultural production and promises the expansion of agroforestry and aquaculture.
Mexico (version 2)	Unconditional Emissions Target	Reduction of 22% of greenhouse gas emissions (GHG) and 51% of black carbon emissions by 2030 as compared to BAU.
	Conditional Emissions Target	Reduction of up to 36% of GHG emissions and 70% of black carbon emissions by 2030 compared to the BAU scenario.
	Additional Content	Mexico commits to 0% rate of deforestation by 2030, reforestation efforts, conservation of biodiversity, and sustainable water management.
	Export Implications	The NDC's deforestation commitment has cost implications for agricultural and forestry sectors, though improvements to crop productivity through diversification are also mentioned. Otherwise, while the NDC mentions various sectors in passing, no commitments are made that would have material impact on export competitiveness one way or the other.
Nicaragua (version 2)	Unconditional Emissions Target	N/A
	Conditional Emissions Target	N/A
	Additional Content	By 2030, 65% of the installed capacity of the electricity matrix should come from renewable energy sources. On LULUCF, the NDC proposes an increase in carbon absorption capacity by 25%, regarding the 2030 Reference Scenario. Both targets are conditioned upon international support.
	Export Implications	Nicaragua's NDC sets goals to reduce deforestation, with cost implications for the agricultural and forestry sectors. It also promotes more productive agricultural practices and intensive ranching practices; no similar productivity enhancements offered for the commercial forestry sector.
Panama (version 2)	Unconditional Emissions Target	N/A
	Conditional Emissions Target	N/A
	Additional Content	Panama conditionally commits to reducing energy sector emissions by 24% by 2050 and by at least 11.5% by 2030, with respect to the BAU scenario, which represent an estimated 60 million tons of CO2 equivalents accumulated between 2022-2050 and up to 10 million tons of CO2 equivalents accumulated between 2022-2030. For the LULUCF Panama sector is committed to the restoration of 50,000 hectares nationwide, which will contribute to the absorption of approximately 2.6 million tons of CO2eq by the year 2050, an increase equivalent to 10% with respect to the average of absorptions for the period 1994-2017.
	Export Implications	Panama's NDC offers incentives for sustainable forestry and agricultural production.
Paraguay (version 2)	Unconditional Emissions Target	10% reduction GHG emissions relative to BAU by 2030 (economy wide).
	Conditional Emissions Target	20% reduction of GHG emissions by 2030, depending on international assistance.
	Additional Content	Paraguay is a unique case in that almost 100% of the energy generated in the country is hydroelectric, and it exports almost 90% of that hydroelectricity to the grids of neighboring countries like Brazil and Argentina. Paraguay's National Development Plan, cited in its NDC, contains a mix of economic targets, support for international carbon markets, generic energy efficiency and forest sustainability goals, and more specific mitigation targets including a 20% reduction in the use of fossil fuels and achievement of 60% renewables in the energy mix by 2030.
	Export Implications	Paraguay's NDC commits to reducing deforestation, with negative cost and output implications for agriculture and forestry. However, in the forestry sector, compensation and productivity enhancements are offered in the form of financial incentives for commercial timber plantations. In the agricultural sector, Paraguay plans to introduce more productive crops and 'technify' crop management. The NDC also makes mention of promoting eco-tourism alongside adaptation measures in that sector. Finally, given the exportation of large volumes of hydroelectric energy to neighboring countries, the NDC's many measures related to improving hydropower generation are considered to be export enhancing and are recorded in the manufacturing category in table 2.

Peru (version 2)	Unconditional Emissions Target	30% emissions reduction, up from 20% vs BAU.
	Conditional Emissions Target	40% emissions reduction, up from 30% vs BAU.
	Additional Content	Peru's NDC is particularly focused on national vulnerabilities associated with climate change, and related adaptation measures, as opposed to outlining a specific methodology or sectoral breakdown of how it intends to achieve its emissions reduction goals.
	Export Implications	The NDC does not outline specific sector by sector actions to be taken, and so impact on competitiveness of exports is unclear.
St. Kitts and Nevis (version 2)	Unconditional Emissions Target	N/A
	Conditional Emissions Target	35% reduction compared to BAU by 2030, conditioned upon financing and technological support. Additional Content: SIDS status and tourism industry are mentioned. Short on specifics.
	Additional Content	SIDS status and tourism industry are mentioned. Short on specifics.
	Export Implications	The NDC expresses the government's intention to enhance crop production, livestock production, aquaculture, and tourism either by introducing new technology and best practices or by bolstering critical resources and infrastructure. However, the activities associated with these endeavors are not specified, and are all conditional upon international funding.
St. Lucia (version 2)	Unconditional Emissions Target	N/A
	Conditional Emissions Target	Saint Lucia's updated NDC will reduce greenhouse gases by 37 GgCO <sub>2</sub> e., compared to 2010 emissions, a deeper reduction in emissions than the first NDC, which effectively proposed to reduce GHG emissions by 10 GgCO <sub>2</sub> e. In terms of percentage decrease, the updated NDC translates to approximately 7% reduction in GHG emissions in the energy sector by 2030, relative to the 2010 emissions. In comparison, Saint Lucia's first NDC effectively resulted in an emissions reduction of 2%.
	Additional Content	
	Export Implications	The updated NDC mentions delivering co-benefits to the agriculture and tourism sectors through the National Adaptation Plan and Sectoral Adaptation Strategy and Action Plans. Specific strategies are not shared in the document, but various mentions of the two sectors' economic importance indicate that the authorities plan to enhance resiliency in these sectors without compromising their competitiveness. Moreover, all measures are conditioned upon international assistance, implying that measures undertaken under these plans are to be fully funded.
St. Vincent and the Grenadines (version 1)	Unconditional Emissions Target	22% reduction of GHG emissions relative to BAU by 2025.
	Conditional Emissions Target	N/A
	Additional Content	St. Vincent and the Grenadines is a SIDS, and focuses on the vulnerability of its coastal zones and tourism industry. It is also one of the only SIDS to make a strong and unconditional commitment to emissions reductions. It is perhaps the only Latin American or Caribbean country to estimate the impact of a trade-related measure: "New policies to reduce the import duty paid on low emissions vehicles are in the process of being introduced to encourage their use. It is estimated that this will result in avoided emissions of approximately 10% over the next 10 years".
	Export Implications	The NDC's anti-deforestation efforts represent a cost to the crop, livestock, and forestry sectors. However, productivity enhancements are offered to farmers in the form of technological support, and instruction on agri-business management and pest control. Fisheries development is also mentioned. In the tourism sector, the NDC states that the country has begun promoting itself as a dive destination, and pledges to protect 20% of its nearshore marine coastal resources to support this growing industry.
Suriname (version 2)	Unconditional Emissions Target	N/A
	Conditional Emissions Target	N/A
	Additional Content	Suriname does not include emissions targets. Being extremely small, with 94% rainforest coverage, Suriname is already carbon negative, and boasts one of the world's lowest rates of deforestation at .02% annually. In its first NDC, Suriname does include a range of adaptation activities it would like to undertake, largely related to storm surge protection. It also mentions, generally, coastal preservation and renewable energy adoption. In its second NDC, Suriname makes certain sectorial commitments, including maintenance of 93% forest cover.
	Export Implications	Suriname's strong commitment to anti-deforestation measures has cost implications for agriculture, forestry, and in this case, extractive industry (gold mining). The NDC also commits to enhancing the productivity of the forestry sector by increasing forward linkages and value-add, and anticipates that increasing the area of protected rainforest will increase eco-tourism revenue.

Trinidad and Tobago (version 1)	Unconditional Emissions Target	30% reduction of emissions in the transport sector over 2013 levels by 2030.
	Conditional Emissions Target	15% reduction across three main contributing sectors (power generation, industry, and transport), relative to BAU by 2030, conditioned upon international support.
	Additional Content	Trinidad and Tobago is a special case among Caribbean countries. First, it is considered a high-income country by the OECD, thanks in large part to exploitation of oil and gas reserves. Second, as a result of its dense industrial infrastructure and small population size, the country emits more GHG per capita than any other country in the Americas, at a level 10 times above the average for Latin America and the Caribbean, and twice that even of the United States (World Bank). As such, the country's NDC is largely oriented toward industrial regulation.
	Export Implications	The NDC commits to reducing industrial emissions by improving efficiency and introducing renewable energy technologies. These measures would be paid for with international funding, neutralizing any cost and competitiveness consequences for producers. No other export sector-specific measures are mentioned.
Uruguay (version 1)	Unconditional Emissions Target	24% reduction in CO2 emissions intensity per unit of GDP; 57% reduction of CH4 (methane) emissions per unit of GDP; 48% reduction in N2O emissions per unit of GDP, all by 2025.
	Conditional Emissions Target	29% reduction of CO2; 59% reduction of CH4; 52% reduction of N2O all possible by 2025 with access to additional means of implementation.
	Additional Content	Uruguay's NDC provides specific reduction goals for each of the gases above for both its food production and forestry sectors as well. It commits to 100% maintenance of native, managed, and shade and shelter forests, and prioritizes renewables, biofuels, pastureland management, and sustainable tourism certifications. Uruguay's NDC is highly detailed and accountable.
	Export Implications	The NDC's anti-deforestation measures represent a cost to the agriculture and forestry sectors. The NDC also commits to reducing emissions from the production of concrete, a new restriction in the manufacturing sector. However, diffusion of new technologies and guidance on best practices would simultaneously increase productivity in crop and livestock production. In the tourism sector, incentives are offered for sustainability improvements, neutralizing any associated costs' impact on competitiveness.
Venezuela (Bolivarian Republic of) (version 2)	Unconditional Emissions Target	N/A
	Conditional Emissions Target	20% reduction of GHG emissions by 2030, entirely conditional upon financing and technology transfer from developed countries.
	Additional Content	The primary mitigation measures outlined in Venezuela's NDC relate to increasing energy efficiency by addressing standards in industry and in consumer goods. Like Cuba's NDC, Venezuela's NDC is mainly used to air political grievances.
	Export Implications	The NDC expresses intentions to improve productivity and resiliency in crop and livestock production. It also commits to efficiency improvements in the petroleum industry, contingent upon international funding.



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