



NATIONALLY DETERMINED CONTRIBUTIONS **ACROSS THE AMERICAS**

**A COMPARATIVE
HEMISPHERIC ANALYSIS**

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Later this year, world leaders from 197 nations will convene in Glasgow for the United Nations Climate Change Conference of the Parties (COP-26) with the goal of reaching consensus on the collective actions necessary to achieve the goals of the Paris Agreement. Here, a key focus of COP-26 will be reaching agreement on a pathway towards achieving global net zero emissions by mid-century while limiting global temperature increases to within 1.5 degrees Celsius. This consensus will also be necessary to take the necessary steps as well as securing the required funding to help developing countries – including many across Latin America and the Caribbean (LAC) – to not only protect and restore vital eco-systems but also make their communities more resilient to the impacts of climate change. Here, developed countries agreed six years ago to provide at least USD\$100 billion in climate financing per year by 2020 to bolster the global south's climate resiliency. Yet, to date, these pledges have fallen short. At COP-26, delegates will also be working to promote a framework for reporting and more transparent monitoring of their country's respective Nationally Determined Contributions (NDCs), as well as on the rulebook for Article 6 of the Agreement, which allows countries to reduce emissions using international carbon markets. The challenges facing many developing and emerging market countries – particularly those in LAC – to deliver on their stated NDCs will be daunting amidst the realities of the COVID-19 pandemic that has caused the worst economic crisis in modern history. For countries such as Argentina, Mexico and Brazil their respective economic recoveries have been hobbled; putting additional fiscal stress on an already weakened public sector unable to adequately deliver critical social services at a time of concurrent climate change impacts that each nation faces. In an effort to better assess progress made to date by countries across the Americas in delivering on their climate commitments, the Institute of the Americas (IOA) has undertaken this policy white paper entitled, Nationally Determined Contributions Across the Americas: A Comparative Hemispheric Analysis. Authored by Tania Miranda, IOA's Director of Policy & Stakeholder

Engagement for our Environment & Climate Change Program, the white paper provides a timely snapshot of progress made, while also highlighting the serious funding gaps that remain if LAC countries are going to deliver on their previously agreed upon climate pledges. Through her analysis and development of country-specific scorecards for 16 countries in the Americas, that represent 90% of the hemisphere's combined population and 98% of its collective GDP, Ms. Miranda highlights some of the regional challenges ahead, including: the growing reliance by some Latin American and Caribbean countries on fossil fuels and the growing risks of the energy transition; and the impacts of climate induced drought on countries, like Brazil and Mexico, dependent on hydro-electric power amidst rising energy demand. Most importantly, Ms. Miranda highlights the critical need for developed countries and international financial institutions to step up their game to help LAC countries meet their NDCs. Clearly, LAC countries cannot deliver on its commitments alone. In the end, LAC only represents about 7% of the world's total greenhouse gas emissions. Yet, South America alone accounts for nearly 35% of the world's total terrestrial carbon stock. So, the region's life sustaining eco-systems are absolutely critical for the survival of humankind. As Lester Brown concludes, "the question we face is not what we need to do, because that seems rather clear...the challenge is how to do it in the time available."



Richard Kiy
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List of Abbreviations, Acronyms, and Definitions

B3W: Build Back Better World Partnership
 BNEF: Bloomberg New Energy Finance
 CH₄: Methane
 CO₂: Carbon Dioxide
 CO₂e: Tons of carbon dioxide-equivalent units
 COP: Conference of the Parties
 DFA: Direct Foreign Assistance
 ECLAC: Economic Commission for Latin America and the Caribbean
 ESG: Environmental, Social, and Governance
 EU: European Union
 FAO: Food and Agriculture Organization
 G7: Group of Seven Nations
 GCF: Global Climate Fund
 GFLAC: Grupo de Financiamiento Climático de América Latina y el Caribe
 GHG: Greenhouse Gas
 GW: Gigawatt
 H₂: Hydrogen
 IDB: Inter-American Development Bank
 IEA: International Energy Agency
 ILO: International Labor Organization
 IPCC: Intergovernmental Panel on Climate Change

IRENA: International Renewable Energy Agency
 LAC: Latin America and the Caribbean
 LULUCF: Land-use, Land-use change, and Forestry
 Mha: Mega hectares
 MDBs: Multilateral Development Banks
 MMBtu: Million British Thermal Units
 MtCO₂e: Mega-tons of carbon dioxide-equivalent units
 MW: Mega Watt
 NbS: Nature-Based Solutions
 NDCs: Nationally Determined Contributions
 NGO: Non-Governmental Organization
 NOCs: National Oil Companies
 NRDC: Natural Resources Defense Council
 OECD: Organization for Economic Cooperation and Development
 OLADE: Latin American Energy Organization
 RCP: Representative Concentration Pathway
 REDD+: Reducing Emissions from Deforestation and Forest Degradation
 TWh: Tera Watt-hours
 UNFCCC: United Nations Framework Convention on Climate Change
 USD: US Dollar

Western Hemisphere: For the purposes of this analysis, the Western Hemisphere includes North America, Central America, the Caribbean, South America, and Greenland.

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Lastly, I want to express my sincere gratitude to Leonardo Beltrán, IOA's non-resident fellow, and Thomas Singh, Director of the GREEN Institute at the University of Guyana, for your detailed and invaluable feedback on this white paper.

Executive Summary

Climate change has taken center stage across the globe as the final countdown to the United Nations Climate Change Conference of the Parties (COP26) in Glasgow, Scotland begins. The highly anticipated COP26 meeting gained greater spotlight following the release of the Intergovernmental Panel on Climate Change's Working Group I's contribution to the 6th Assessment Report, highlighting the unequivocal evidence of human-induced global warming and its direct impact on increasing extreme weather events' frequency and intensity.

The impacts of climate change (such as hurricanes Lota and Eta smashing into Central America last year, massive forest fires across the Amazon, and severe drought in Argentina, Mexico, Paraguay and Uruguay) and the urgency to act have not gone unnoticed in Latin America and the Caribbean (LAC). Argentina and other LAC nations hosted a regional climate summit on September 8, 2021, in an effort to create a unified front for the upcoming COP26. Among the key issues addressed was the one on how to finance countries' pledges under the Paris Agreement known as Nationally Determined Contributions (NDCs) assumed by countries, and particularly the role international financial institutions could and should be taking, as well as areas in which regional cooperation could help advance common goals—such as clean electricity generation and coastal resilience.

Many countries in the region have ambitious climate commitments for 2030 and 2050 and are making progress in setting ad hoc policy frameworks to achieve them. What is largely missing is the required funding, both from national and external sources. The gap in required funding among LAC nations is in the order of billions of dollars a year and will prove difficult to meet without outside assistance, particularly in light of the COVID-19 related economic crisis impacting the region—the worst in a generation.

With the goal of facilitating dialogue on the need for increased leadership and funding in support of national climate plans across the Americas, the Institute of the Americas' white paper provides a snapshot of the NDCs, with emphasis on 16 countries: Argentina, Barbados, Brazil, Canada, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Guyana, Haiti, Jamaica, Mexico, Peru, Trinidad and Tobago, and the United States. Many of these NDCs have been updated. Collectively, the countries profiled in this white paper represent 90%

of the Hemisphere's total population and 98% of its combined GDP.

We examine, through country-specific scorecards, different relevant commitment components including adaptation—which is extremely relevant for a region that is at high risk of climate disasters. More than 27% of LAC's population lives in coastal areas, and 6–8% lives in areas that are at high or very high risk of being affected by coastal hazards and sea-level rise. The report also assesses progress made with the incorporation of climate pledges into national legislation. Without institutional and legislative efforts, NDCs are just empty promises. In addition, the alignment of COVID-19 recovery packages with countries' climate pledges is explored, as this represents an opportunity to build back greener, yet it is an opportunity that has largely been ignored by many nations in the Americas aside from a few, such as Canada, Brazil and Colombia.

Finally, we analyze the percentage of commitments that are dependent on international assistance. Only five of the LAC countries we reviewed have made 100% of their pledges unconditional. For a region engulfed in debt, where many of its productive sectors have been endangered by the COVID-19 economic standstill, pinpointing the funding sources for NDC implementation is of the utmost importance. This conditionality of NDCs also means that the burden of their pledges will rely heavily on the G-7 countries and the private sector. In this regard, the United States and Canada, the two most developed economies in the Americas, have recently made new pledges to help address that finance gap. Yet while this pledged direct foreign assistance (DFA) is a useful start, the amount proves completely inadequate in the context of the total needs in Latin America and the Caribbean.

Beyond addressing the funding gaps, our white paper outlines the need to leverage nature and ecosystems, adapt successful models to attract investment into renewables such as energy auctions, and make use of innovative finance mechanisms to expand access to capital. Doing so will require developing countries to push through institutional reforms to promote transparency and the rule of law in order to de-risk investments. Countries will also need to make significant efforts to decarbonize their own finances to garner support from international finance institutions and climate funds. The trend away from fossil fuels and how ESG standards are shaping capital flows also bears noting.

Executive Summary

Through our analysis, we note the extent of potential limitations. Energy, agriculture, and land-use (e.g. deforestation) are the three largest sources of greenhouse gas (GHG) emissions in LAC – representing 88% of emissions – and any effort to decarbonize will have to concentrate on these areas. But, as we highlight in this paper, there are notable opportunities to further climate action, many of which can be considered so-called low-hanging fruit. Specifically, efforts targeting renewable energy systems, sustainable fuels and supply chains; agricultural practices; and nature - and ecosystem - based solutions can have important impacts. The region alone holds over a quarter of the world's forest cover and almost half of the remaining tropical forests, yet the fast overall ecosystem degradation calls for action now. The rate of tree loss in the entire Amazonian basin since the 2000 is of about 8 percent. Likewise, LAC holds over 25% of the global mangrove cover, yet 20% of that has been lost between 2001 and 2018. Without adequate financial incentives, this vital carbon sinks could be lost forever.

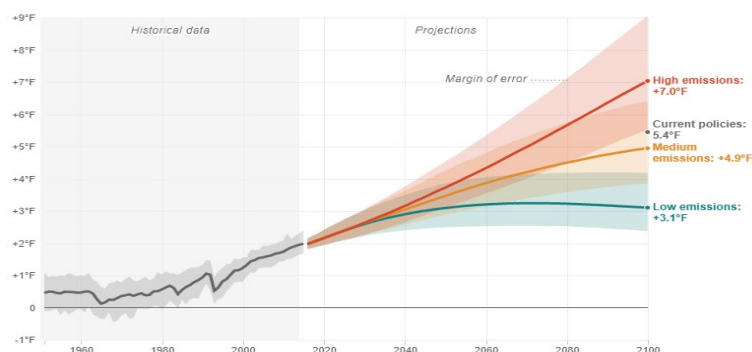
Overall, our work aims to further shape and inform the climate debate. The regional scorecard is a great tool to emphasize the most critical areas of near-term attention needed from policymakers and government officials. This will be particularly useful in the final countdown to Glasgow and perhaps also to spur an LAC unified message, specifically with regards to increased funding for the region.

Introduction: Climate Change, the Imperative to Act Now.

In August 2021, a group of more than 200 climate scientists from around the world published an advance of the 6th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC),ⁱⁱ the most authoritative international body in climate science, and one that policymakers and enterprises rely on for decision-making. This report released evidence supporting the fact that it is conclusive and unequivocal that the planet is warming faster than it has in the last 2,000 years, that this warming is human-induced through greenhouse gas (GHG) emissions, and that the frequency and intensity of extreme weather events such as heatwaves, storms and intense droughts are on the rise.

Because of the permanence of GHG emissions in the atmosphere, *today's* emissions will be a significant determinant of the future path of global warming, and this means that the worst impacts are avoidable if action is taken now to address current emissions. As seen in *Figure 1* below from the 2021 IPCC Report, under current policies we would be facing a temperature increase of almost 5.4-degrees Fahrenheit (3-degrees Celsius). We need to limit that to 3 degrees (or around 1.5-degrees Celsius), according to the report, to avoid natural tipping points and positive feedbacks that would unleash the worst effects on our climate – and on our current way of life. This is still possible, but the window of opportunity is closing dangerously quickly.

Figure 1: Temperature Projections to 2100 Depending on Emissions Pathway



Source: <https://www.ipcc.ch/report/ar6/wg1/>

These climate effects such as increased incidence of drought, sea level rise, ocean acidification, heatwaves and storms, have strong negative impacts on all areas of our economies. Food and water security will be threatened, various health issues will be worsened, and tourism will be disrupted. Entire supply chains, and the public finances of countries, will be put to the test. Large-scale displacement and migration will follow. In fact, studies indicate that this warming climate in the LAC region could push up to 2 million people into extreme poverty and cause an average 4% loss of its GDP by 2030.ⁱⁱⁱ

With respect to the Americas, the threats are becoming ever more real. A July 2021 scientific study published in *The Lancet*^{iv} found that extreme weather accounted for 9.4% of all deaths globally between 2000 and 2019. The study found that in each of North America, South America and the Caribbean, excess heat and cold is responsible for about 200,000 deaths every year. This is only one of multiple health-related consequences of climate change, in addition to increases in water- and air-borne diseases arising from growing GHG levels.

Furthermore, according to a 2020 publication^v by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC), between 1970 and 2019 alone, the LAC region suffered from 2,309 natural disasters that caused 510,204 deaths, and damages worth over USD 437 billion. Only in the first half of 2021, the region has seen 25 extreme floods, seven storms, three volcanic-related events, an earthquake, and a forest fire, that in sum have caused hundreds of millions of dollars in damages and affected over 1.1 million people.^{vi} This is a testament to the cost of inaction, which will only increase as temperatures continue to rise and extreme weather events become more frequent and intense.

These numbers are sobering, more so considering that these effects tend to affect disproportionately those communities with poor access to resources such as water and food, and those that live from sectors such as agriculture and fishing that are highly susceptible to environmental and climatic changes, and that cannot easily afford to take measures to adapt their livelihoods for what is to come.

A few weeks away from the 26th United Nations Climate Change Conference of the Parties (COP26) in Glasgow that will convene representatives from all signatory parties of the 2015 Paris Agreement, and from the private sector, NGOs and financial institutions, it is important to review the commitments made by countries in the Western Hemisphere, with a focus on Latin America and the Caribbean. These commitments, set internally by each country, are known as Nationally Determined Contributions (NDCs), and under article 4.3 of the Paris Agreement, member parties should revise and increase their ambition every five years. This obliges signatories to the agreement to submit new commitments to the UN Framework Convention on Climate Change (UNFCCC) in 2020. Though climate commitments by LAC countries

will only have an impact on the global challenge to reduce emissions if all other countries, particularly the largest emitters, also take significant action, an assessment of this nature is essential to allow understanding of overall trends, as well as challenges and opportunities ahead for these countries in the wake of COP26.

This report contributes to those efforts by examining the multiple facets of the region's NDCs, including a detailed analysis of 16 nations from the Hemisphere, and an overall scorecard of the Americas in terms of climate action and ambition. *Appendix A*, available at the paper's website, contains individual country scorecards of those 16 countries, examining the following topics:

- GHG emission targets and their ambition *vis à vis* their previous submissions;
- Adaptation-related targets and their ambition;
- Level of reliance on international sources for funding those targets;
- Net-zero (emission) commitments;
- Whether or not countries are on track to meet their targets;
- Whether or not countries are implementing legislation consistent with their NDCs; and
- Whether or not COVID-19 recovery measures are aligned with NDCs.

The paper includes a section on what we consider are key challenges and opportunities ahead—focused on countries from LAC—and main takeaways. This section aims at understanding emerging issues stemming from climate change that affect the economy, energy security, public finances, and supply chains of these countries, and it identifies opportunities and potential recommendations to tackle them. It focuses on the following six topics:

Key Challenges:

- Reliance on Fossil Fuels and Transitional Risks;
- Rising Electricity Demand + Declining Hydropower;
- Climate Finance: the Big Gap.

Strategic Opportunities:

- Nature-based Solutions to Increase Adaptation, Resilience and Mitigation;
- Sustainable and Innovative Agricultural Practices;
- Renewable Energy Systems.

As context, the paper provides an overview of some of the most relevant statistics per country, as well as regional carbon sinks (that sequester emissions and thus help towards climate action if properly managed). These can be consulted at the report's

website, where the reader can find further interactive maps and links to all of the countries' UNFCCC official websites.

Furthermore, *Appendix B* provides four mini case-studies of selected climate change hemispheric hotspots, as examples of the impact higher temperatures are already having in the Americas. The following cases were reviewed: Greenland, Alaska and Canada – loss of permafrost and sea-level rise; Mexico (the Central Valley) – severe drought and climate migration; Amazonia (Brazil) – from carbon sink to carbon emitter, and; Caribbean Islands – sea-level rise.

Climate change is the most important challenge currently faced by humankind and we need to act now. There will be winners and losers in industries as well as in countries, yet every person and country will be affected as climate change does not recognize borders. And yes, adapting to it will be costly, and mitigating further planet warming will require massive investment of resources. But not adapting and not mitigating will be even more costly—and more so the longer it takes us to act. The Western Hemisphere, and Latin America and the Caribbean alone, has the natural capital and endowment to lead the way in adaptation and resilience, which will also help towards mitigation.

Many countries in the region have realized the potential of the green revolution towards protecting the environment, reducing climate change and conserving ecosystems, and also towards creating jobs and boosting economic growth and equality. These countries are leading the pack on climate action and have strongly increased their NDC ambition before Glasgow. Other countries need to follow, as together they will make a stronger case for support at COP26, and economies of scale will reduce the cost and increase the impact of these efforts.

The Americas in Numbers: GHG Emissions and Carbon Sinks

The United States is the largest historical GHG emitter, responsible for almost 30% of global cumulative (historic) emissions, and is currently the second largest emitter after China. It is responsible for about 14% of global GHG emissions every year.² Canada on the other hand, is the 10th largest emitter—contributing about 1.6% of global emissions. Notably, Canada is the 9th largest emitter on a per capita basis, ranked before the US (ranked 12th), and well before any other Latin American country leaving the Caribbean aside. LAC, as a whole, is responsible for around 7% of global planet-warming emissions, mostly from the energy sector, agriculture, and land-use, land-use change and forestry (LULUCF), as *Figure 2* below shows. This amount is

² Data is from 2018, measured in MtCO₂e, from *ClimateWatchData*.

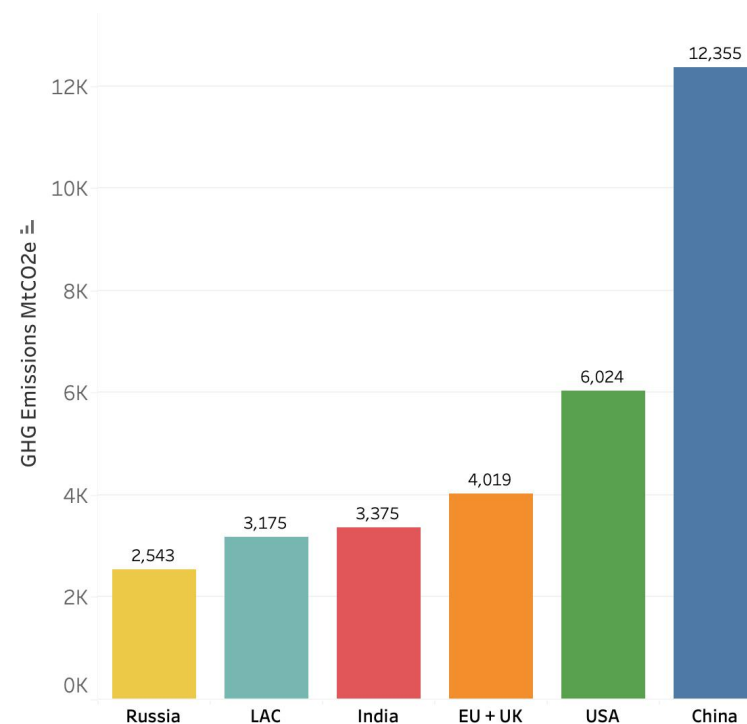
close to what India alone emits. See *Figure 3* below for a global comparison of GHG emissions by different countries and blocks.

Figure 2: Source of Greenhouse Gas Emissions by Sector in LAC



Source: *Economics of Climate Change in Latin America and the Caribbean*, ECLAC, 2019.

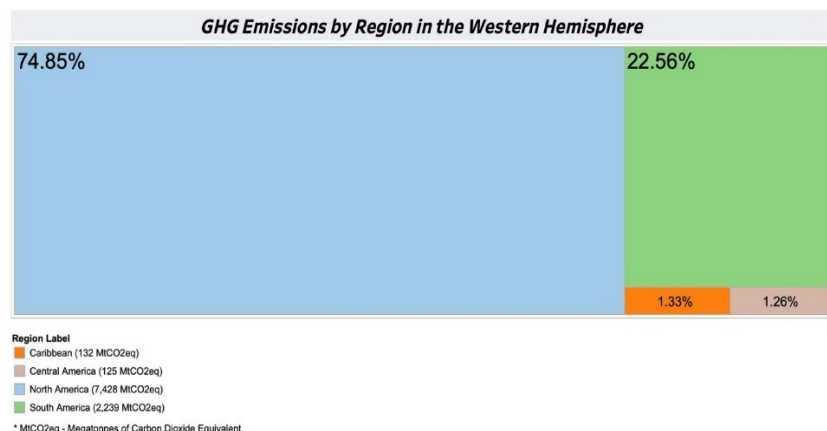
Figure 3: Comparison of GHG by Region, Excluding LULUCF³



In terms of total emissions, in the rest of the Hemisphere, the highest emitters are Brazil, responsible for 2.25% of global emissions (and seventh global emitter); Mexico, with 1.5% of total global emissions (and 12th emitter overall); and Argentina in a far third, with 0.8% of total emissions worldwide.

In the Western Hemisphere, North America is responsible for almost 75% of emissions and South America for 22% (see *Figure 4* below). This suggests that the bulk of efforts and resources directed towards emission mitigation should be devoted there. On the other hand, Central America and the Caribbean should be directing resources towards adaptation and resilience, keeping in sight that those strategies will also contribute towards abatement, cost-effectively, and will be of the utmost importance because of their climate risk profile.

³ Own graph with data from 2018 from *ClimateWatchData*.

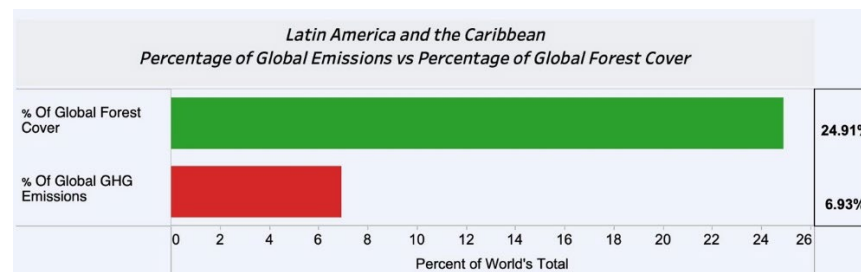
Figure 4: Greenhouse Gas Emissions by Region in the Americas⁴


On the other hand, Latin America and the Caribbean holds a high proportion of the world's carbon sinks. For example, LAC has about a quarter of the world's total forest cover—see *Figure 5 below*—and almost half of the tropical forests.⁵ Brazil alone has 12% of the world's total cover measured in mega hectares (Mha), and a third of the world's remaining primary tropical forests.

In fact, LAC's forests provide up to 8% of the world's industrial wood products, and house roughly half of the world's terrestrial species.^{vii} However, the overall ecosystem degradation and forest loss rates particularly in South America are higher on average than in the rest of the world (even though some progress was made between 2000 and 2010), as forests are cleared for cattle pasture, soy farms, logging, and other land pressures. Since 1978, about 100 million hectares of Amazon rainforest have been destroyed across Brazil, Peru, Colombia, Bolivia, Venezuela, Suriname, Guyana, and French Guiana. The rate of tree loss in the entire Amazonian basin since the 2000 is of about 8%. In fact, the country with the highest area of deforestation in the world during the 2010s was Brazil.^{viii} This speaks to the need to focus more efforts locally, and urgently, on biodiversity restoration in the region.

⁴ Own graph with data from *ClimateWatchData*

⁵ Data from *GlobalForestWatch, 2010*

Figure 5: Comparison of the LAC Region's Percentage of Global Greenhouse Gas Emissions vs Percentage of Global Forest Cover⁶


In later sections, this paper will examine how forests and coastal ecosystems such as mangroves can be leveraged as cost-effective mitigation and adaptation solutions. Furthermore, conservation and restoration efforts need to be ramped up, as there is a strong risk of losing some of these carbon sinks forever. The Amazonian forest is the most recent example, as there is strong evidence that the southeastern portion of this natural wonder has already switched from being a carbon sink to a net source of carbon emissions, according to a July 2021 study published in the journal *Nature*.^{ix} More details are provided in one of this paper's mini-case studies on climate hot-spots in the region (*Appendix B*).

In terms of blue carbon sinks, data is scant for many countries in the region, yet the sequestration potential across the Hemisphere is also large and as such, remains another crucial ecosystem for potential climate mitigation.⁷ Collectively, the Americas accounts for nearly 32% of global mangrove distribution (and 25% in LAC alone), an important contributor to the world's blue carbon biomass.^x Brazil has the second largest mangrove extension globally after Indonesia, and Mexico is a close fourth, after Nigeria.

However, according to a paper^{xi} by *Earth Security*, mangroves are one of the planet's most threatened ecosystems, currently being lost at faster rates than coral reefs and all other forest types, including tropical and sub-tropical. Half of the world's mangroves were already lost in the last 50 years, and in Latin America and the Caribbean, about 20% of mangrove area was lost from 2001 to 2018.^{xii} This loss is not only relevant to biodiversity and ecosystem services that sustain entire communities and industries, but also to tackle the Earth's rising temperatures. The assessment points out that mangrove losses account for up to 10% of global emissions from deforestation, and it bear an annual economic loss in the range of

⁶ Own graph with data from *GlobalForestWatch*

⁷ Mangroves have a carbon storage capacity of 1,000 tons of CO₂ per hectare on average.

USD 4 to 19 billion. It is imperative that more attention and resources are spent towards conserving these ecosystems throughout LAC if the region is to tackle the climate crisis on time.

Road to COP26: Hemispheric NDC Commitments & Scorecards

On the 5th anniversary of the Paris Agreement, celebrated in 2020, signatory countries were required to review their commitments and, under the principle of progression of the Agreement, were required to seek to increase their own target ambitions to achieve net-zero emissions by 2050. The following section of the paper examines efforts (or lack thereof) across the Americas to step up commitments to climate action through updated NDCs. This is more relevant than ever as we approach COP26 this October—where Parties will attempt to finalize the so called rulebook of the agreement (especially on markets), review the current largely inadequate NDCs and related emission reduction pledges, and lobby developed countries for more climate finance.

It should be noted that many of the LAC countries are going through either intense political crisis and social unrest, or through recent or upcoming elections that have the potential to change their position on climate action. The latter is the case for five of the 14 highlighted countries in Latin America—Chile, Colombia, Ecuador, Mexico, and Peru. Although COVID-19 has directly impacted each of these countries in different ways, at the time of writing, their respective NDC commitments do not properly take those impacts into account.

Accordingly, these nations' NDC scorecards can easily be affected by a myriad of factors such as changes in political will, access to funds and resources, public support, and most importantly, changes in government. The uncertainty of climate commitments is particularly notable for countries such as Peru and Ecuador that recently went through presidential elections, and thus the continuity or lack thereof of political will regarding climate action remains largely unknown.

It is worth noting that seven of the 15 most megadiverse countries in the world^{xiii} in terms of their biodiversity are in the Americas (ranked in order of importance): Brazil, Colombia, USA, Mexico, Venezuela, Ecuador, and Peru. We focus on those (minus Venezuela), that are also some of the most important GHG emitters in the Hemisphere. Canada is an interesting case as, even though it only represents around 1.5% of global emissions, its emissions per capita profile is high, and it has large forest, water, and gas reserves. Chile and Costa Rica are also included as climate leaders in the region both in terms of mitigation and adaptation, and in the

case of Costa Rica, it has one of the cleanest energy profiles in the world. Argentina is also included, as the third largest LAC emitter particularly given its huge shale gas potential.

Finally, six Caribbean nations are included because of their exposure to the worsening effects of climate change, and because some of them have shown leadership on the issue, such as Barbados and the Dominican Republic, and to some extent Jamaica. Other Caribbean nations, such as Trinidad and Tobago, still rely heavily on fossil fuels for power generation. Lastly, all will require considerable support from the international community to put into action their climate plans, as most of their pledges are fully conditional on international development assistance.

The Big Picture

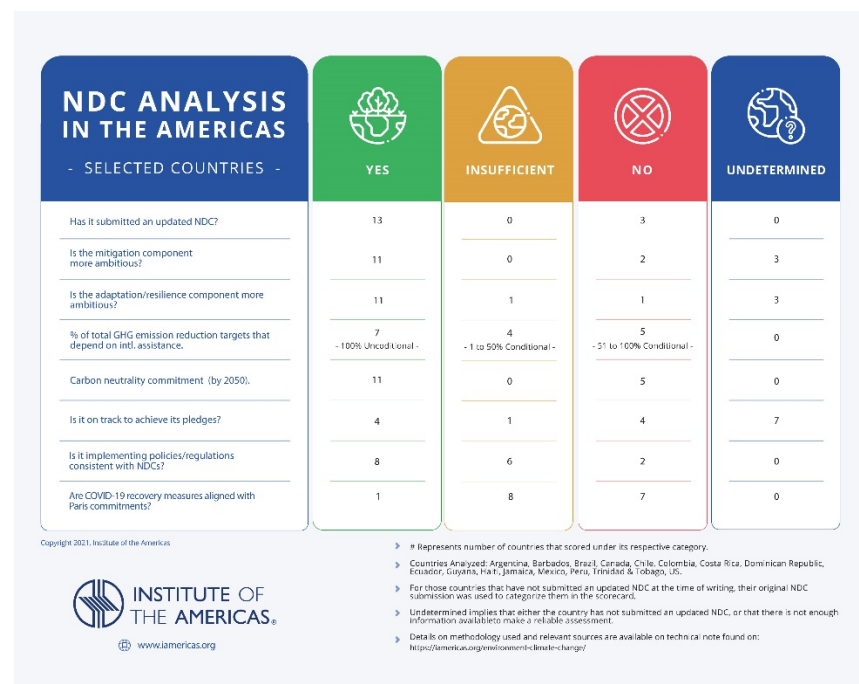
As can be seen from the hemispheric scorecards (*Figure 6, Figure 7*), all countries analyzed in the Americas except three (all from the Caribbean) have submitted updated NDCs. From the 13 countries that have submitted updated commitments, all but two—Brazil and Mexico—increased their GHG emission reduction targets. This is in line with Latin America's historic trend regarding climate action. It is also a region where climate change is not a highly politicized issue, and for which generally the population is in favor of acting. In fact, a poll^{xiv} made by the Latin American Energy Organization (OLADE) during September and October of 2020 throughout 25 nations and with responses of over 260 different actors (including governments, private sector, academia and other institutions that work in the energy space), revealed that 74% of respondents indicated that climate change will be a priority moving forward and that governments should tackle its consequences through mitigation efforts. If anything, it seems like these countries are ever more in agreement for governments to act on the climate crisis.

The region's collective ambition and overall rhetoric is not, however, fully backed up by actions that will translate into actual emission reductions.^{xv} There is a strong case for countries to take advantage of the window of opportunity brought by the COVID-19 pandemic that will require governments to promote employment, undertake large infrastructure projects, and make sizable investments in key industries as well as public services including healthcare and education consistent with climate and sustainability goals. This could be a key factor determining the emissions trajectory of a country long into the future. Furthermore, most of the Hemisphere's long-term net-zero targets, fundamental to steer countries into a 1.5 degree-Celsius emissions path, are only proposed legislation or stated in a policy document—yet have not been ingrained in law.

Finally, a large portion of the region's pledges (including those from Brazil and Mexico, the largest economies in LAC) are somewhat or fully contingent upon receiving international development assistance and financing. This means that the developed

world, in particular the G7, and multilateral development banks (MDBs), will also need to step up their game should they wish to see the ambitious pledges set across Latin America and the Caribbean actually fulfilled. This issue will be covered in more detail later in the report.

Figure 6: Americas Hemispheric NDC Scorecard



It is worth highlighting several countries in the region, such as Barbados, Chile, Colombia, Costa Rica, the Dominican Republic and Peru, that have demonstrated high ambition and action regarding their NDCs in most categories. This level of ambition could change particularly in Chile and Peru, given the uncertainty of their political outlook in the future. Colombia's NDCs are among the most ambitious in the region, even though it represents about 5% of the LAC region's total emissions. A 20% emissions reductions target by 2030 in its 2015 NDC was increased to a 51% emissions reduction target in its 2020 update.

Costa Rica, a historical climate leader, did not disappoint. It is one of few countries in the LAC cohort that actually established—and ingrained in domestic policy through a National Decarbonization Plan—a detailed strategy to achieve net-zero emissions by

mid-century through the electrification of the public transport system, energy efficiency measures, improved farming practices, and the establishment of a voluntary emissions reporting mechanism. In fact, Costa Rica's NDCs are among the few at a global scale that are closely aligned to the 2-degree Celsius objective of the Paris Agreement according to *Climate Action Tracker*.

In contrast to Costa Rica's leadership, Brazil and Mexico—responsible for over 50% of the region's overall emissions—are both lagging compared to the region's collective efforts to tackle the global climate crisis. The actions of these two countries could also have potentially negative region-wide effects. In both cases, their updated NDCs are no more ambitious, and their respective governments are implementing policies and regulations that could in fact reverse mitigation efforts. In short, if they were not yet on track to meet climate pledges before, they are now on an upward emissions trend.

It is also worth noting that, up until the current administration, Mexico had historically been at the forefront of the fight against climate change, domestically and internationally. Brazil is also perhaps the only case of one of the world's large emitters to actually reduce the ambition of its NDCs regarding GHG emission targets^{xvi} and to completely dispense with an adaptation component in their 2020 update. Mexico and Brazil are nations of the utmost importance in terms of their natural capital and biodiversity, as the first and fourth most megadiverse countries in the Hemisphere. Accordingly, protecting their respective biomes is essential for the region.

It is likewise important to note that the United States remains, by and large, the world's second largest GHG emitter. The US is still far from being on track to deliver on its original Paris Agreement commitments—let alone the updated and more ambitious targets. Additionally, the Biden Administration has still, at the time of writing, not secured legislative approval in the U.S. Congress to implement the required actions it laid out to fulfill its recently updated NDCs.

It is worth highlighting, however, that the Biden Administration's proposed \$3.5 trillion budget and legislative package currently under negotiation in the U.S. Congress could mitigate up to 1 billion metric tons of carbon emissions, according to a recent analysis by the Rhodium Group.^{xvii} The US is striving to correct course as it strives to make up for lost time in contributing to this crisis, and the efforts achieved to date on several fronts are noteworthy. In mid-September 2021, the US and the EU pledged^{xviii} to reduce 30% of methane (CH₄) emissions—a short-lived yet potent GHG with a global warming potential 25% higher than CO₂—by 2030. This will have to come in hand with

a strong and ambitious action plan from the oil and gas industry,⁸ as it is responsible for about a third^{xix} of US methane emissions.

What the US government can achieve at home through its methane pledge, its flagship infrastructure bill, and abroad at COP26 through its soft power, is to influence other nations, MDBs and private sector investors to support and expand the current levels of international climate finance available to the developing world. In that sense, the White House also announced a month and a half away from COP26 that it would double yearly climate-related aid to the most vulnerable nations with a total annual commitment of USD 11 billion.^{xx} Given the present climate related challenges across the LAC region, and current funding gaps, this more than anything could have a profound effect on the region's fight against the climate crisis.

NDC Scorecards: a Summary of the Region

Figure 7: Detailed Scorecard on the Americas' NDCs



⁸ CH₄ is the main component of natural gas.

⁹ A document containing details on the methodology for each of the scorecard's categories, including the color-coding system, and country-specific sources, can be found at <https://iamericas.org/environment-climate-change/>.

¹⁰ A disclaimer must be made about the overall assessment of current and future progress towards meeting NDCs in the region, as, due to a lack of technical capacity and resources in some LAC countries, the available information is at times limited, and what is published online might not reflect what is happening on the ground. As case in point, a *World Wildlife Fund* report from March

1. Have countries submitted updated NDCs and are GHG emission reduction targets more ambitious?

At the time of writing, out of the 16 countries analyzed, all but Guyana, Haiti, and Trinidad & Tobago had submitted their updated NDCs, and eleven countries had submitted more ambitious targets. In that sense, it could be said that the Americas in general is abiding by Article 4.3 of the Paris Agreement, underlying that member parties should revise and increase their ambition every 5 years. Many countries increased their greenhouse gas emission reduction targets, some of them even doubling their pledges, such as Colombia and Jamaica. The latter also moved towards an economy-wide target and included emissions from the land use change and forestry sectors for the first time.

Other countries, such as Chile and Peru, moved from intensity-based to absolute targets (thus effectively capping its emissions *allowance* in the future), and a growing number of countries are including black carbon emissions in their NDCs.¹¹ Only Mexico's NDCs ambition stayed the same and Brazil's effectively decreased.¹²

2. Have countries committed to a net-zero timeline?

Countries need to establish a long-term strategy if they are to achieve net-zero emissions by mid-century, to avoid stranded assets and to allow management of economy-wide transitions. This transformation will require infrastructure investments, demand-side adjustments and government regulations, which means decisions made now will affect emissions paths for years to come. An Inter-American Development Bank (IDB) study points out that, "Long-term strategies can guide the design of more ambitious NDCs, help governments to anticipate costs, manage trade-offs, and ensure a just transition to net-zero emissions, while identifying the immediate policy reforms and investment priorities necessary to unlock the transformation".^{xxi} Because of this, even if 2030 goals are where sights should currently be set, nations need to establish a 2050 strategy and start moving towards carbon neutrality.

The Americas as a whole has done a sizeable effort in this regard. At the time of writing, out of the 16 countries analyzed, nine LAC nations, plus the U.S. and Canada,

2021¹⁰ rightly underscored the generalized need for LAC nations to improve their monitoring and reporting of NDC progress through official and transparent systems.

¹¹ Black carbon emissions are relevant, as it is a short-lived climate pollutant with direct impacts on climate but also on human health.

¹² Brazil's update got rid of the reference it had originally made to an absolute emission allowance, which could allow for possible increases in emissions.

had at least established a mid-century net-zero commitment (although Brazil's is contingent upon external financing).^{xxii} However, as mentioned previously, only Canada's pledge is ingrained into law; Chile's is being discussed as a proposed legislation; and many of the others are still not mentioned in the updated NDCs. Costa Rica is well ahead of the curve in implementing its National Decarbonization Plan.

The International Energy Agency (IEA) reported in a July 2021 paper that, "The number of countries that have pledged to achieve net-zero emissions has grown rapidly over the last year. However, most pledges are not yet underpinned by near-term policies and measures" and furthermore, that "the largest number of pledges are in policy documents that are not legally binding".^{xxiii} Finally, five countries have yet to announce a timeline: Ecuador and Mexico, as well as Guyana, Haiti and Trinidad and Tobago from the Caribbean.^{xxiv}

3. Are updated NDCs more ambitious on climate adaptation and resilience?

According to the OECD, only around 20% of global NDCs are tied to national adaptation plans to date, from which around 17% set quantifiable and robust targets. Yet Latin American countries have vast experience and knowledge, particularly from indigenous communities, on how to use ecosystem services to mitigate, adapt, and build more resilient livelihoods through the protection, restoration, and sustainable management of ecosystems that should be leveraged and built upon to help meet national climate pledges. Projects involving these factors have enormous mitigation and adaptation potential, because of these region's large natural endowments, and as the price of carbon starts to rise, this could become an important source of funding for biodiverse countries.

As a region highly vulnerable to climate change risks, and with a low emissions profile, the NDCs of LAC nations generally have a strong focus on climate adaptation. This is even more noteworthy in the island nations of the Caribbean, where sea level rise and hurricanes are a severe and worsening problem already. In that sense, all but one of the Caribbean nations analyzed included a robust adaptation component in their NDCs (even though some have not submitted updated versions at the time of writing), targeting multiple sectors of their economies, and particularly, concrete strategies for agriculture, land use, coastal ecosystems, and risk assessment and management. Trinidad and Tobago was the exception—which did not include an adaptation component in its first and only NDC.

In the rest of Latin America, surprisingly, Brazil was the only country that did not include an adaptation-only component in its NDCs (although it did in its first submission), and most others included clear objectives and priority areas for

adaptation targets. There is, in general, a greater focus on agriculture and land-use management, including REDD+ projects (Reducing Emissions from Deforestation and Forest Degradation), but also, increasingly, strategies regarding blue carbon and coastal ecosystems through Nature-based Solutions, as a result of the potential for high-impact, low-cost projects in the region. Peru, for instance, included tourism and transportation as key new sectors for its adaptation strategies.

According to an analysis^{xxv} made by the *NDC Partnership* based on the assistance provided to developing nations for their NDC enhancement process (albeit not specifically in the LAC region), they found that countries are, in fact, increasingly prioritizing and accelerating adaptation projects through specific funding requirements—mainly targeting water, agriculture, infrastructure and Nature-based Solutions. On the other hand, projects in Small Island Developing States were largely focused on building a more resilient transportation sector. The analysis importantly emphasizes that "technical support in the financing stage will play a crucial role in unlocking investment and funding opportunities", something that needs to be prioritized by developing nations in their request for assistance through their NDC enhancements, but also through all other bilateral and multilateral cooperation mechanisms.

Finally, the United States mentioned adaptation efforts specific to agriculture, land-use, forestry, and coastal ecosystems for the first time in their updated NDCs, but fell short of including specific action plans or targets and fails to mention the 30X30 initiative (to conserve at least 30% of US lands and oceans by 2030), which Biden committed to through an executive order.^{xxvi} Canada did include targets and a more ambitious adaptation component in its NDCs.

4. Are countries on course to achieve their pledges thus far?

According to data trackers available,¹³ out of the 16 countries analyzed, only Colombia, Costa Rica, and Peru seem to be on emissions trajectories that will allow them to achieve their NDC commitments by 2030 and 2050. Three other countries, Argentina, Chile, and Ecuador are on a trajectory that suggests it may be possible to fulfill their pledges, meaning they would need to further implement policies and align interests and investments for the country to get on the right emissions trajectory to meet their pledges.

On the other hand, all Caribbean Island Nations analyzed, as well as Ecuador, were left as *undetermined* in this category, as there is not enough data available publicly to make an assessment of their current trajectory (in many cases because of limitations in their GHG inventories). Finally, other four countries, the four largest economies and emitters of the Hemisphere—Brazil, Canada, Mexico and the US—are

¹³ All sources by country are detailed on a *Methodology Notes & Sources* document available at <https://iamericas.org/environment-climate-change/>

not on course to achieving their international commitments under current and planned policies.

5. Are countries implementing policies/regulations consistent with NDCs?

The NDCs ought to be ingrained in legislation and implemented through regulations that put in place the correct incentive mechanisms, channel resources, and plan for long-term infrastructure projects needed for the transition to take place. Without commitments being codified in law, they remain largely theoretical.

At the time of writing, only half of the countries analyzed have implemented policies and regulations in line with their NDC commitments, through market mechanisms, regulations, mandates, and necessary investments. These were Costa Rica in Central America; Colombia, Peru and Chile in South America; and Barbados, the Dominican Republic, Jamaica, and Trinidad and Tobago.

On the other hand, five countries have policies and regulations somewhat aligned to their climate commitments, but the alignment is insufficient, meaning that at the same time they have also enacted regulations that go contrary to climate pledges as these could increase emissions, for example, in favor of fossil fuel development. This was the case for Argentina, Canada, Ecuador, Guyana, and the United States.¹⁴

Haiti was deemed insufficient as well, as it does not appear to have taken steps or implemented policies internally that will get it closer to achieving its goals. Finally, government policies and regulations in Brazil and Mexico are going in the opposite direction to their NDCs, which likely already reversed their GHG emissions pathway in some sectors. The country-specific scorecards on *Appendix A* of this paper provide details on those policies.

6. Are countries' COVID-19 recovery measures aligned with the Paris

Up until the time of writing, the UN Environmental Programme (UNEP) COVID-19 LAC tracker^{xxvii} that follows fiscal expenditure policies on a weekly basis, had found that only 0.5% of total spending and 2.2% of long-term recovery spending was environmentally sustainable in the region, compared to 2.8% and 19.2% globally, respectively. This category of the regional NDC scorecard was the one in which LAC performed the poorest. Sadly, this represents a missed opportunity to create jobs, improve infrastructure and spur economic growth in affected communities, while at the same time contributing to NDC pledges—something that has proved to be possible

¹⁴ The White House efforts to stop the federal oil and gas leasing program were halted by the courts:

<https://www.reuters.com/business/energy/us-says-taking-steps-restart-oil-gas-leasing-2021-08-25/>

time and again. Furthermore, if climate considerations are disregarded in large investment and infrastructure projects as part of the recovery spending, particularly in the energy sector, there is a high risk that countries could lock-in emission pathways that are not consistent with their Paris pledges, leading up to costly stranded assets.

The only country deemed as an “incipient promise” in the region by the UNEP tracker was Panama (not covered by our report), whose 44% of total recovery spending was labeled as green, mostly dedicated to increasing and improving public transportation throughout urban populations—such as the extension of metro lines. To date, from the LAC region, Argentina, Barbados, Brazil, Chile, Colombia, the Dominican Republic, and Jamaica have spent anywhere between 1% and 50% of their total COVID-19 recovery spending on green measures, from which Brazil and Colombia had the highest green spending percentage—a little above 25 percent. These countries were labelled as *insufficient* on this category. The United States also falls in that group, having spent 9% of its total recovery spending on green measures.

Canada was the only country in the Americas from those analyzed that had spent more than 50% of its recovery spending on green measures, having spent a solid 75 percent – the only country categorized in green in the scorecard.¹⁵ To that end, Canada has, for example, invested in a strategic innovation fund for clean energy infrastructure; in energy efficiency and building upgrades, and; in the restoration and enhancement of wetlands and agricultural lands to boost carbon sequestration.

On the other hand, according to the UNEP tracker, “(some) governments have earmarked a small amount of funds for recovery spending but none for environmentally-sustainable initiatives. Recovery spending is often meaningful for social and economic development but possibly fails to make progress against environmental objectives”. Countries that fell in this category – labelled as red in the scorecard – were Costa Rica, Ecuador, Mexico and Peru, as well as Guyana, Haiti, and Trinidad and Tobago from the Caribbean.

As COVID-19, in addition to natural disasters, have decimated the Caribbean economies the past year, mostly due to the tourism industry standstill, most of these countries have dedicated the resources they have available to target immediate relief efforts regarding the health crisis and unemployment.

7. Percentage of total GHG abatement commitments that depend on international finance.

¹⁵ Information from Canada and the United States on this category came from the Global Recovery Observatory by Oxford University's Economic Recovery Project: <https://recovery.smithschool.ox.ac.uk/tracking/>

Out of the 14 countries analyzed in Latin America and the Caribbean, only Argentina, Chile, Colombia, and Costa Rica made all their NDC targets unconditional—a significant enhancement of their first round of pledges—although Costa Rica indicated that some international assistance would be required. Jamaica, Mexico and Peru, on the other hand, made between 15% and 40% of their total NDC emission reduction targets conditional upon securing international funding. Notably, Jamaica increased the unconditional component of its updated NDCs substantially.

Finally, Ecuador, all Caribbean nations (but Jamaica), made anywhere between 50% and 100% of their NDC pledges conditional. Barbados NDCs went from being fully conditional, to only half of its reduction targets being conditional on its latest submission. Brazil did not include conditional targets; however, its NDCs appear to be contingent upon appropriate market mechanisms and resources to allow continued conservation of the Amazon.

It should be underscored that, even though some progress has been made compared with the first round of NDCs in the region, with a few exceptions LAC countries have yet to assess the full costs associated with their NDC implementation, as for now, the true amount of conditional resources needed is not well known. It is therefore beyond the scope of this paper to assess the overall financing needed from the developed world and multilateral institutions to support the region's climate pledges.

However, it is safe to say that a large portion of international climate commitments in the region will undoubtedly rely on the developed world's ability to fund their implementation. Given the small proportion of the world's annual GHG emissions contributed by LAC nations, particularly in Central America and the Caribbean, these nations can claim it is up to the developed world to do the heavy lifting of emissions reductions. Yet, as explained earlier, the region provides cost-effective mitigation solutions based on ecosystem and nature, and the need to invest in resilience is urgent.

Key Challenges

1. Reliance on Fossil Fuels and Transitional Risks

Besides securing resources to make the transition, one of the region's greatest challenges and something that will be critical to address if countries are to achieve their NDC pledges, is the region's on-going reliance on fossil fuels. This is not only because most countries still largely depend on hydrocarbon-based energy systems to

¹⁶ Ecuador's recently-sworn in President Lasso said in one of his first public statements that he was issuing a decree aimed at doubling oil production by making the E&P legal framework more

power their economies—which drive their GHG emissions pathway—but also because of the transitional risks that this poses for countries with important extractive industries, as the rest of the world transitions and demand for these resources fades.

Of the 16 economies analyzed, many depend largely on extractive industries, such as oil and gas, such as Argentina, Brazil, Colombia, Ecuador, México, Peru and Trinidad y Tobago. Highly dependent on economic rents for their public finances, they are, in turn, highly susceptible to oil and gas price swings. For a 31% fall in the Western Texas Intermediate price (of oil) between 2012 and 2018, for instance, these nations' fiscal revenues from hydrocarbons fell by more than half (from 6.5% of GDP to 2.9%, albeit with somewhat differentiated effects amongst countries).^{xxviii}

Some, such as Chile, still rely largely on coal, (although this country has recently made strides to reduce such dependence), and others, such as Jamaica and the Dominican Republic, largely depend on imported fossil fuels. Costa Rica might be one of the few exceptions in the region, as it is almost 100% powered by fossil-fuel free electricity. This situation is even more critical because about half of Latin America's installed capacity runs on hydropower, which is itself at risk from shifting water patterns and drought aggravated by climate change. A portion of this installed capacity might therefore need to be backed up with other firm sources of generation.

Because of this, new power demand is unlikely to be met with hydro, and so any added firm capacity to meet growing demand for power, and to back-up added intermittent generation from wind and solar, will have to be met by other sources, including renewables plus storage, and hydrogen. However, the easy route for many LAC countries will be to develop projects using the abundant natural gas resources in the region, for which infrastructure is mostly already developed, and which is less contaminating than coal (yet still, in the end, a fossil fuel).

1.1 Short-term Gains vs. Climate Action

Oil and gas will play a key role in the COVID-19 economic recovery in many LAC countries such as in Argentina, Colombia, Ecuador, Brazil, Mexico and Peru. Oil and gas projects in these countries are becoming more competitive in today's markets, but more importantly, revenue from taxes and rents will provide important and rapid contributions to their incomes. Because of this, the administrations in both Mexico and Ecuador¹⁶ are betting big on increasing oil production, and both Argentina and Brazil are undertaking massive new shale and natural gas projects respectively. Reconciling these carbon-intensive, infrastructure projects with their respective international climate commitments will be a challenge, as the former could increase emissions, thus pushing attainment of their NDCs farther away. Per the IEA most

attractive for investors: <https://www.spglobal.com/platts/en/market-insights/latest-news/oil/070721-ecuador-president-issues-decree-to-open-petroecuador-to-private-investors>

recent findings, a 1.5 degree-emissions pathway is not compatible with new fossil fuel projects beyond 2021.^{xxix}

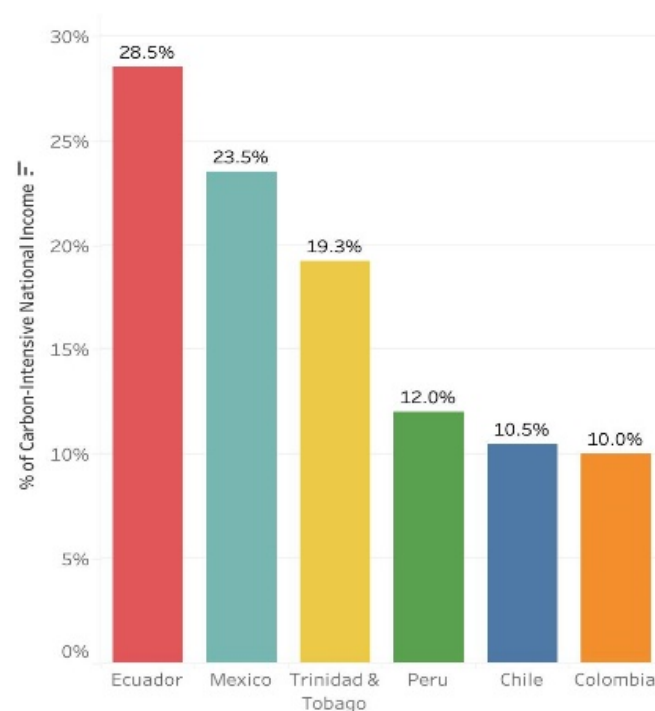
Although economic development in the region has been largely fueled on hydrocarbons in the past decades, today renewables are, or are in the process of becoming, more competitive in many of these countries, following a global trend that will force LAC countries to eventually adjust. However, the longer they take to act, the larger the impact will be on their public finances. On the one hand, countries that are betting their economic recoveries on extractive industries, particularly on oil and gas, will increasingly struggle to finance these projects, as investors and MDBs are becoming more hesitant to fund fossil fuel generation given increasing scrutiny regarding Environmental, Social and Governance (ESG) standards both from regulators and stakeholders, and because of possible impacts on their sovereign ratings.

On the other hand, these fossil fuel dependent countries will face increasing fiscal pressures as the sector enters its declining stages, since their incomes rely heavily on extractive rents. For example, according to the *Grupo de Financiamiento Climático de América Latina y el Caribe* (GFLAC) 2019 *Climate Finance Index*,^{xxx} 28.5% of Ecuador's income is carbon-intensive,¹⁷ the equivalent figure for Mexico is 23.5%, and for Trinidad and Tobago, 19.25% (see Figure 8). If these countries fail to diversify their incomes as the world moves away from hydrocarbons, their public finances will face an inevitable crisis in the future. An IDB paper shows that scenarios consistent with the 1.5-degree goal mean that 66% to 81% of proven, probable, and possible oil reserves in Latin America should be left untouched before 2035. In such an event, regional oil exporters could lose up to USD 3 trillion in royalties.^{xxxi}



¹⁷ Carbon-intensive labelled budget, per GFLAC's analysis, is that which is mainly associated with revenues from tax and non-tax revenues from hydrocarbon exploration and extraction.

Figure 8: Top 6 LAC Countries by Percentage of Carbon-Intensive Income



Data Source: GFLAC's 2019 *Climate Finance Index*

In addition to a fiscal crisis should countries fail to transition steadily out of extractive industries, national oil companies (NOCs) run the risk of becoming obsolete and of being left with massive stranded assets. The countries' economic competitiveness as well as that of their overall labor force will be severely compromised. These factors can be dampened by: i) providing political certainty, and appropriate incentives for the private sector to invest in the technologies of the future and assist countries in their transition; ii) through leveraging the existing infrastructure and NOCs skills to make sure the industry does not lag behind and instead becomes an engine of innovation and economic growth in line with global tendencies; and iii) in the near-term, producing and exporting nations should make sure to leverage upward natural

resource prices and higher rents as demand soars, to invest in that transition, instead of using them to finance short-term, political projects.

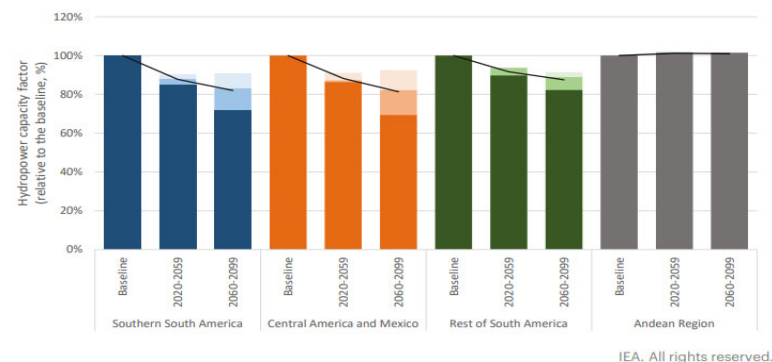
2. Rising Electricity Demand + Declining Hydropower

Hydropower provides 45% of power supply in Latin America and the Caribbean, and as the region's main source of electricity generation, hydropower will play a critical role in the future of the energy sector in many LAC countries. Total hydro installed capacity in the LAC region was 196 GW in 2019, of which 176 GW were in South America alone. Hydropower is, then, the largest source of renewables in the region, ranging from 50% of renewable energy production in Uruguay, to 70% in Brazil, Colombia and Ecuador, and 100% in Paraguay (according to IEA's latest figures).^{xxxii} However, climate change is putting in danger the future availability and predictability of this natural resource, as rainfall patterns change, glaciers melt, and temperatures rise.

This presents a serious energy security challenge for the region, as LAC nations are developing countries where economic growth is still very much coupled with energy demand. Thus, electricity demand in LAC will continue to rise in the near future. According to IEA's latest projections, without energy efficiency savings, electricity demand in the region will almost double by 2050, from 1,295 TWh in 2020 to 2,541 TWh in 2040. Furthermore, if countries continue to promote the electrification of transportation and other sectors as an avenue to reduce emissions, ensuring reliable, cheap sources of power will become even more important.

A study on *Climate Impacts on Latin American Hydropower*^{xxxiii} by the IEA that assessed climate impacts on over 86% of the hydropower installed capacity of Latin America, showed that “the regional mean hydropower capacity factor over the period from 2020 to 2059 is likely to decrease by around 8% on average (from 7.5% in the “Below 2°C” scenario to 9.6% in the “Above 4°C” scenario), compared to the baseline level of 1970-2000.” The same capacity factor is projected to be lower than the baseline by over 11% on average between 2060 and 2099. These effects will be strongest in the Southernmost part of South America, as well as in Central America and Mexico. Hydropower capacity is only projected to increase, albeit slightly, in the Andean region, along the northwest coast of South America. See *Figure 9*.

Figure 9: Projection of Changes in Hydropower Capacity Factors by Latin American Sub-region, 2020-2099 Relative to Baseline (1970-2000)



Source: *Climate Impacts on Latin American Hydropower*, IEA, 2021.

This potential water scarcity in the region will create competition for the resource in multiple productive sectors of the economy, including power production, agriculture, and urban supply. If not addressed now, this could result in political instability and social conflict. In addition, deforestation and land-use change will exacerbate the water problems because forests play an important role in generating precipitation. The same IEA analysis predicts that recent trends in deforestation for agriculture and urbanization in Colombia, Peru, and Ecuador could potentially heighten their existing hydro capacity vulnerabilities.

A positive aspect is, however, that if nations address deforestation and land-use change emissions to create more resilient ecosystems, this would have the co-benefit of reinforcing hydro capacity factors and the energy security of the region overall, and would provide water-management strategies for irrigation and urban supply, as hydro power often provides water storage. This is particularly relevant in South America, because the Amazon Basin is responsible for rainfall across a large portion of the continent, and a recent study^{xxxiv} published in the *Renewable Energy International Journal* calculated that the hydro potential of all five basins examined in South America decreased by 25 percent between the baseline period (1961-1990) and 2014-2019.

LAC nations, and in general Western Hemisphere countries that rely on hydro power, including the United States, should invest in the modernization of ageing hydropower facilities. Almost half of the hydro installed capacity in Latin America is over 30 years old. They should perform a detailed risk assessment of their plants and provide the

necessary climate risk insurance, and include climate impacts on hydro generation and water supply in their national adaptation plans.

Likewise, the region should develop the untapped potential it has of geothermal power generation, as it offers baseload capacity 24 hours a day. LAC holds anywhere between 55 to 75 GW of capacity potential, yet only 1.8 GW are currently online (mostly in Mexico, Chile, Central America and small projects in the Caribbean).^{xxxv} As these countries look to replace carbon-fueled power plants, and to fill in potential gaps from hydroelectric generation stemming from changing weather patterns, this could be a great avenue to secure capacity, for which many of these countries will need to develop much needed policy frameworks that can provide certainty to investors.

3. Climate Finance: The Big Gap

3.1 Financing Mitigation and Adaptation in the LAC Region

The achievement of climate change mitigation and adaptation targets outlined in the Paris Agreement by LAC countries will depend on correct policy implementation and market signals, but mostly on the availability, mobilization and channeling of external resources. Some of the developing and least-developed countries in the region, because of higher priority issues of concern, and limited resources, made certain percentages of their NDCs conditional on external funding and assistance that needs to come from developed nations and climate funds, MDBs and other financial institutions. This need for external funds has been exacerbated in the wake of the COVID-19 crisis. LAC was the most economically affected region in the world, with a GDP fall of 7.2% in 2020. This strained government finances, also downgrading some sovereign ratings, increasing their cost of capital.

To make matters worse, a majority of LAC countries have not made a detailed assessments of the costs associated with the implementation of their Paris Agreement pledges—most likely related to a shortage of technical capacity—and thus it is not possible to pinpoint their true financing needs. Mexico released in 2018 the associated costs with its first NDC submission, but only for its unconditional commitments and thus this does not reflect the overall finance gap. The Dominican Republic is one of the few other exceptions, that estimated expected costs associated with mitigation and adaptation measures, while committing to monitoring and reporting government expenditure towards climate action. Guyana also revealed an assessment of the costs associated with the conditional part of its original NDCs. Colombia addressed the need to undertake this assessment, noting that it is in the process of developing the technical capacities to do so.

In light of this, undertaking this exercise would be the first step towards understanding the necessary funding and resources that will need to be sought at both national and international levels. Yet in any case, it is a reality that there is a

large funding gap, in the order of billions of dollars a year, between the so-called green transition implementation costs, and the resources countries in LAC are allocating to climate action. Mexico, the second largest economy in LAC, has an estimated funding gap of roughly USD 6bn per year, for the implementation of its unconditional commitments only, and for actions related to mitigation (not inclusive of adaptation). This speaks about the critical need for countries in the region to commit more funding, and find more resources elsewhere, if they are to achieve their stated climate goals.

3.1.1 Paris Agreement Article 2.1.c in Latin America and the Caribbean

Article 2.1.c of the Paris Climate Agreement aims to “*strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.*” Signatory developing parties should marshal private and international funds to fill the resource gap and fulfill their NDCs, but should also be aligning their own income and expenditures to their climate goals. Unfortunately, as previous work from GFLAC through their *Sustainable Finance Index*^{xxxvi} shows, this is an area in which Latin American countries are lagging behind.

GFLAC’s assessment examined resources earmarked for climate change, renewable energy and energy efficiency, and natural disaster prevention (bundled as *sustainable budget*) of 21 LAC countries, in their national budgets for 2019. Granted, countries might be allocating actual resources to these efforts that are not labelled as such and will therefore not be taken into consideration, but these are resources that cannot otherwise be tracked down or accounted for.

The study found that national sustainable budgets did not exceed 0.6% of total national budgets, and furthermore, that budgets labelled for oil and gas exploration and production exceeded the total sustainable budgets in 11 of the 21 countries analyzed. The countries that earmarked the highest percentage of their total budget as *sustainable*, were Jamaica (0.58%) and in close second Colombia (0.54%). On the other hand, Argentina (0.08%), Chile (0.06%), Mexico (0.05%), Brazil (0.05%) and the Dominican Republic (0.05%) allocated less than 0.1% of their annual budgets to climate and sustainability actions. This means, furthermore, that governments, acting with short-term interests in mind, are allocating resources to suboptimal investments in the long-term.

This inadequate budgeting will largely affect LAC nations in their efforts to address climate change in two ways. First, it will inherently make it an uphill struggle to effect real change and achieve their NDCs, so long as they do not commit appropriate amounts of resources into activities such as institutional capacity building and technology. Secondly, it makes it harder for LAC countries to advocate and lobby for more resources abroad for their conditional NDCs if they do not commit more

resources of their own, as it appears as if they are not serious in their efforts. COP26 could be the perfect forum to rally MDBs, developed countries, and the private sector for more funding—yet LAC countries would need to up their game at home first and start allocating larger, sustainable, budgets to back up their unconditional pledges.

3.1.2 Conditional Climate Pledges in LAC and How to Fund Them

As mentioned previously, from the countries analyzed in Latin America, only Argentina, Chile, Colombia, and Costa Rica made all their NDC targets unconditional (and somewhat Brazil, in the sense that it calls for funding to protect the Amazon). Jamaica, Mexico and Peru, on the other hand, made between 15% and 40% of their total mitigation targets conditional upon international funding. Finally, Barbados, Dominican Republic, Ecuador, and Haiti made between 50% and 85% of their total NDC targets conditional, and Guyana and Trinidad and Tobago 100%.

This reveals the overall commitment of countries to climate action, but also their financial situation. The COVID-19 pandemic has only placed more pressure on some governments into taking funds away from such pledges, as they are already highly indebted and the immediate needs of their peoples require urgent action. A recent NDC Partnership survey^{xxxvii} of LAC-participating countries revealed that 71 percent of respondents expect financial resources to be channeled away from climate pledges in order to tackle emerging COVID-19 issues.

According to the IEA's *Net Zero by 2050* report, clean energy investments, mostly in the developing world, will have to more than double by 2030 in order for the world to reach net-zero emissions by mid-century. That capital will never flow into emerging markets without large amounts of concessionary and blended finance, as some currencies in emerging markets have weakened, and governments have become highly indebted post-COVID-19.

This situation was addressed by multiple countries on September 8th, 2021, during the *High-Level Dialogue on Climate Action in the Americas*, co-hosted by Argentina and others in the region. Mia Mottley Prime Minister of Barbados, bluntly laid out the absence of any fiscal capacity in the Caribbean, the reason why more concessional finance and a blended approach is absolutely necessary for climate action. Along the same lines, Iván Duque, President of Colombia, highlighted the need to address and re-assess the crediting processes by MDBs and financial institutions at large. According to Duque, this has pulled many LAC nations into a perverse, positive feedback cycle in which a developing country that is immersed into an economic crisis because of a climate change-induced natural disaster, is punished because of a poor financial standing with more expensive capital costs, thus preventing the country's quick recovery and hurting its credit rating even further.

Alberto Fernández, President of Argentina also observed that, *"there is no ecological crisis stranger to the social crisis, and stranger to the need to reassess the global*

financial architecture. We need new forms of financing and new rules so that the [green] transition is just".^{xxxviii} In this respect, several heads of State echoed the need to come up with new mechanisms for developing nations to finance climate action, linked to climate results, through debt-relief and ecosystem conservation incentive structures.

Another possible mechanism to promote the green transition from within, proposed by Leonardo Beltrán – board member of the UN's Sustainable Energy for All – would be the integration of the energy systems of the region through the consolidation of a trust fund.^{xxxix} Such a scheme could be supported through equity finance provided by international financial institutions, and a technical and political body conformed by the different pertaining associations in the region. This would pool resources, markets (comprised by 635 million people, from which 8 out of every 10 live in urban settings), and demand for clean energy. Up to 28% of the GDP in the region comes from construction, mining, manufacturing and electricity.

Likewise, there are successful examples of the implementation of carbon and environmental taxes in the region, such as Chile and Mexico, although progress has been limited. These cases should be built upon and replicated elsewhere. Similarly, other market mechanisms, like emission trading systems, could be considered and implemented at a regional scale. To date, according to the UNFCCC, around two thirds of Paris signatories include some sort of carbon pricing mechanism in their NDCs, and the World Bank estimated that, "using carbon pricing approaches on a large scale to meet the emission reduction targets set in NDCs could reduce the cost of climate change mitigation by 32% by 2030".^{xl} However, even though the Paris Agreement lays out the possibility of using market-based mechanisms to achieve country-wide emission reductions through Article 6, the regulations and methodology have yet to be defined. In that sense, pushing for a standardized regulation on carbon pricing would go a long way in providing developing nations with more tools, and funding, to tackle the climate crisis.

3.2 The Developed World Needs to Step Up Its Game

Understanding that leveraging enough finance will be one of the most important challenges faced by most LAC countries—and developing nations around the world—when trying to deliver on their climate promises, developed nations made a commitment at the 2009 COP16 meeting that by 2020: *"[developed country Parties], in the context of meaningful mitigation actions and transparency on implementation, commit to a goal of mobilizing jointly USD 100 billion per year to address the needs of developing countries"*. Should this assistance not materialize, many developing nations will be forced to pick and choose which commitments to fulfill.

Unfortunately, an OECD report^{xli} from 2020 stated that climate finance provided and mobilized by developed countries for the developing world totaled less than USD 80 billion in 2018 (up by merely 11% from 2017). Interestingly, the increase was driven

mostly by public finance, as private funding remained almost flat and climate-related export credits remained negligible at USD 2.1 billion—accounting for less than 3% of total climate finance. It is important to note that the green transition needs significant investment from private capital, as governments will come nowhere close to providing the necessary funds without this support, particularly in the context of an economic contraction such as that caused by COVID-19 that paralyzed most nations' economies.

From 2016 to 2018, Asia benefited the most from these international climate funds, receiving 43%, followed by Africa with 25%, and the Americas with only 17%. Within the Americas, the lion's share went to South America (70%), followed by Central America (17%), and the Caribbean (5%). Furthermore, according to the *Regional Report on Climate Funding in Latin America*,^{xlii} with data from 2018, the main source of international climate aid to the region currently comes from the Clean Technology Fund, a multilateral fund administered by the World Bank. To date, this fund has allocated USD 947 million to 29 projects. The second source of funding is the Amazon Fund, which has invested in 102 projects for a total of USD 717 million. The Green Climate Fund (GCF) has been the third largest source of aid in LAC, having funded 14 projects, for a total of USD 656 million. The fourth source is the Global Environmental Fund (GEF). These four funds account for a total of 75% of multilateral climate funding in Latin America and the Caribbean, and the recipients of these resources are highly concentrated in Brazil and Mexico, which together received about half of the funding.¹⁸

Since President Biden took office, the United States has quickly made commitments to marshal more funds and assistance to developing countries related to climate and sustainability—given his strong interest in making these issues pillars of his legacy—and released an international climate finance strategy in April 2021.^{xliii} This includes among other things: i) doubling climate funding for poor nations by 2024 from the high average levels hit during the Obama administration, and tripling climate adaptation finance; ii) USAID will leverage USD \$250 million in federal funding to attract USD \$3.5 billion in private sector financing aimed to sharply scale up climate finance programs in 20 fast-growing economies; iii) launching a Global Climate Ambition Initiative, whereby the U.S. will work with developing countries to establish net-zero strategies, and; iv) mandating a net-zero investment portfolio requirement by 2040 for the Development Finance Corporation (DFC). In September 2021, the

White House also pledged to increase yearly climate finance for the hardest hit countries to up to USD 11.4 bn.^{xliv}

That said, the United States, even under President Biden, is allocating only millions of dollars to Latin America and the Caribbean for climate finance in DFA in its 2022 budget. This will certainly not make a dent in the region's climate finance gap. However, the US has strategic interests in the region. Of its total imports, about 20% comes from LAC, and this region furnished over four-fifths (81.3%) of the imported fruits that Americans consume and over 85% of the vegetables.^{xlv} The regional capacity to keep providing the world with these exports will largely depend on its ability to adapt crops to a warming climate. In addition, climate change, as explained through one of this paper's mini-case studies on climate hotspots, will cause increasing forced migration that is bound to affect the United States soon enough. In that sense, there is a strong argument for the US government to increase climate-related DFA to LAC, and effectively become an engine of the net-zero transition in the region.

On the other hand, the G7 Leaders at their June 2021 meeting launched a *Build Back Better World* (B3W) Partnership,^{xlvi} targeting low- and middle-income countries, as a bold plan that would grant them improved access to financing for low-carbon infrastructure projects—in a way meant to provide a more sustainable-focused funding alternative to China's Belt-and-Road Initiative. As good as this sounds, however, analysts agree that the leaders of the G7 failed to deliver the what, when, and where. Laurence Tubiana, key architect of the Paris Agreement, said that, "*In the face of a perfect storm of planetary crises, the world's richest democracies have responded with a plan to make a plan*".^{xlvii} Besides that, only a handful of the most rich and powerful made new pledges; Canada pledged C\$5.3bn and Germany €6bn a year by 2025.^{xlviii} Previously, the UK had doubled its investment commitment at the UN General Assembly in 2019.

That said, it appears that developed nations still need to make good on their annual USD 100bn promise (which has fallen short by 20%). In the absence of such support, LAC countries will need to channel more of their own funds towards climate action and resilience if the region is to come anywhere close to fulfilling the Paris NDCs. MDBs and international financial institutions need to listen to the region's outcry for much-needed improved access to capital, and global regulators should move forward with taxonomy, disclosure mechanisms and ESG standards, so that private capital flows in and can be leveraged more quickly too. In the words of UN Secretary General

¹⁸ Bilateral climate finance also flows into the region as a complement to the multilateral funds, such as those from Germany, Sweden, and the United Kingdom, but in smaller amounts.

Antonio Guterres, the private sector, financial institutions and the developed world alike need to be prepared to take more risks.¹⁹

Strategic Opportunities

4. Nature-based Solutions to Increase Adaptation, Resilience and Mitigation

Nature-based Solutions (NbS) provide a large— and mostly untapped —opportunity for Western Hemisphere nations to tackle climate change, while at the same time increasing resilience and adaptability, at low cost. Coastal ecosystems and forests, that are abundant in the Americas, can help tackle mitigation because of their enormous carbon sequestration potential. They can also help communities adapt to climate change and build more resilient livelihoods. In fact, they can be leveraged to build infrastructure resilience in the face of a changing climate in a cost-effective way. According to a recent study by the University of Oxford, Nature-based Solutions “could provide around 30% of the cost-effective mitigation that is needed by 2030 to stabilize warming to below 2 °C”.^{xlix}

Furthermore, investing in climate change adaptation could bring positive side effects in health, through reduced air and water pollution, as well as in agriculture through higher yields and soil repair, and could also protect against extreme weather events. LAC’s natural capital endowment and carbon sinks data underscores that the region has the potential to provide ecosystem services on a massive scale, which, if leveraged correctly, could advance the region’s mitigation and adaptation pledges through NbS that put countries on a sustainable economic growth path.

A relevant finding that comes from the scorecard analysis, is that all but one country in Latin America (not including the Caribbean), have natural capital as a percentage of the world’s total that far exceeds their percentage of global yearly emissions. This makes a strong case to invest in nature-based projects in Latin America, as it provides ample opportunity to pursue cost effective mitigation strategies (in compared to, for instance, North America), while at the same time, conserving the vast amount of living biomass it provides.

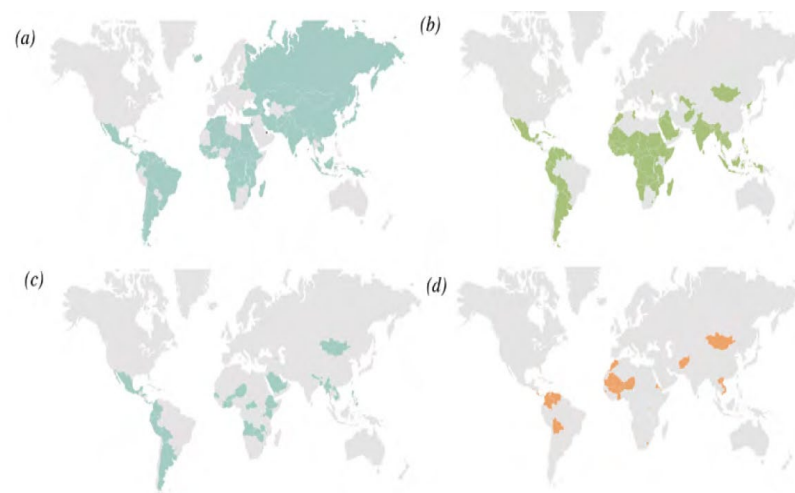
4.1 Blue Carbon: Untapped Opportunity

Evidence suggests that LAC nations have made strides to incorporate these strategies into their climate plans. It is noteworthy, however, that most NbS included in current NDCs are focused on terrestrial carbon sinks, while marine, coastal and

Yet, according to the above mentioned Oxford study, only 19% of NDCs from coastal countries reference marine and coastal ecosystems in their mitigation sections, and they are particularly under-represented in the commitments of developed countries (including a few that make no reference whatsoever to marine and coastal ecosystems in their NDCs—such as Brazil). Furthermore, only 12 countries have acknowledged synergies between adaptation and mitigation components of marine and coastal ecosystems, of which five are in the LAC region (Antigua and Barbuda, Belize, Mexico, St Lucia, and Suriname)²⁰.

As seen in *Figure 10*, the LAC region has made some progress in recognizing the potential of leveraging NbS towards climate action pledges, although mostly as mitigation measures (not as much as adaptation nor in cross-sectional strategies).

Figure 10: Global Distribution of Countries that Included in their NDCs: (a) NbS in Mitigation Components; (b) NbS in Adaptation Components; (c) Explicit Mention of Synergies Between Mitigation and Adaptation; and (d) Several Quantitative Adaptation Targets.



Source: *NbS Solutions in NDCs: Synthesis and Recommendations for Enhancing Climate Action by 2020*. Seddon et.al.

¹⁹ From UN Secretary General Antonio Guterres opening remarks on the *High-Level Dialogue on Climate Action in the Americas*, on September 8th, 2021.

²⁰ <https://portals.iucn.org/library/sites/library/files/documents/2019-030-En.pdf>

Costa Rica is currently exploring synergies between adaptation measures and mitigation through avoided deforestation, such as consolidating their Environmental Services Payments program in the forestry sector and the Forest Certification program. The country has also established the ambitious NbS target of protecting 100% of the recorded coastal wetlands to date, by 2025. In the case of Ecuador's most recent NDC submission, it included NbS for mitigation and adaptation, including the development and implementation of sustainable agro-productive systems, strengthening sustainable forest management and restoration, increasing the National System of Protected Areas, and conserving areas of water importance. Ecuador has, in fact, put in place a Payment for Ecosystem Services (PES) program for forestry since 2008, and one for mangroves more recently, which have proved highly successful in incentivizing the conservation of such ecosystems by the communities that depend on them.

Mexico, on the other hand, included several nature-based cross-cutting adaptation and mitigation components focused on water management, preventing deforestation, and through sustainable economic activities that improve ecological connectivity and conservation schemes. Mexico also included a new multisectoral approach focused on blue carbon that aims at actively removing CO₂ through the conservation and restoration of coastal and marine ecosystems such as mangroves and salt-marshes.

Caribbean Island Nations are working together on regional resilience initiatives targeting coastal and marine ecosystems through projects for proof of concept, in the scalability of those projects, and the exchange of best practices and technical capacities. This model of South-South cooperation should be pursued too between other Latin American countries to advance nature-based infrastructure projects, particularly in forestry, blue carbon ecosystems and agricultural practices, in such a way that they can benefit from economies of scale and pooled resources.

As the world begins to gauge the real potential of natural carbon sinks, and the benefits of sustainable practices in agriculture, fishing, tourism, and overall land management, countries and investors are increasingly turning to NbS. Here, the LAC region stands to benefit because of its rich biodiversity and natural capital, and extensive experience with these projects, particularly in indigenous communities.

According to the *Earth Security* paper^{li} mentioned previously, the financial return of mangrove restoration in Mexico, Brazil, Colombia and Ecuador, at a price of carbon of USD 60/tCO₂, would be as high as USD 2.4 billion. And, in terms of restorable mangrove cover, Mexico holds the world's second largest potential after Indonesia, and Brazil the third, with 18.5% and 6.3% respectively. Taking into account the full extent of the social benefits and ecosystem services of mangroves, the study suggests that blue carbon from mangroves could eventually be priced at up to USD 417/tCO₂—about 7 times higher than the price used for the profitability analysis above. Even if the carbon price increase never reflected the full range of positive

externalities of these ecosystems, the revenues calculated by that assessment would multiply, becoming a game-changer for these countries.

4.1.1 The Role of Governments in Crowding In Private Investment

The financial mechanisms developed specifically for these strategies are, however, in their early stages. According to Melissa Menzies, Associate Director of Sustainable Finance at Scotiabank, *"the market for green financing for resilience and adaptation programs is still maturing, as organizations build an understanding of the opportunities. Although global green bond issues reached \$1 trillion by 2020, just 5% of all green bonds issued in the past decade were categorized as adaptation"*.^{lii} As pointed out in a 2019 report^{liii} by the IDB, these projects are still untapped by the private sector as the benefits are by and large unknown, but also by governments, in times when most are making hefty investments in infrastructure as a way to tackle the pandemic's economic impacts throughout the region.

As is the case for climate action in general, in the LAC region the main challenges will be limited technical, institutional and implementation capacity, and most importantly, limited financial resources. Climate action will rely upon the developing nations to establish the regulations and market signals, so as to provide investors with long-term certainty and security to invest. The support of the United States and Canada, private equity (notably venture capital), and MDBs will prove critical in helping overcome the gaps and in ensuring that the available financial mechanisms scale quickly enough.

The IDB report mentioned above suggests that governments should "integrate NbS into policy commitments for multiple linked objectives and translate commitments into laws and regulations that govern the delivery of infrastructure by project developers".^{liv} This will drive demand for projects and the adoption of stricter ESG standards. Mounting international pressure towards net-zero targets will also drive the necessary investments. Along the same lines, national governments need to establish a robust mechanism for community engagement and bottom-up involvement, to ensure the appropriate implementation of projects, and the prioritization of social inclusion towards a just transition.

5. Sustainable and Innovative Agricultural Practices

Rapid growth in livestock production and agriculture, fueled by a spike in global demand, has made Latin America the largest exporter of beef and poultry in the world—representing about 45% of agricultural GDP in the region—as well as the world's largest net food exporting region. This growth, nonetheless, requires an urgent shift towards a sustainable approach to prevent mounting pressure and stress on ecosystems in the region, which are already raising food security challenges. According to a study by the United Nations Food and Agriculture Organization (FAO),^{lv} the regional livestock sector in Latin America is growing at twice the world average

rate, pushing communities to illegally invade forest cover for grazing cattle and grain production for livestock production systems. As a result, the region is already facing severely decreasing crop yields (according to FAO, 70% of grazing lands in LAC countries are undergoing degradation to different degrees) and it is bringing important consequences regarding greenhouse gas emissions. The food and agriculture systems are unavoidably linked to climate change: land-use change and agriculture are currently responsible for more than 40% of GHG emissions in the LAC region, they consume about 75% of freshwater resources, and use over one third of the region's land area.^{lvi}

Furthermore, as temperatures rise and water patterns shift with climate change, livestock and agriculture will become highly vulnerable if resilience and sustainability strategies are not prioritized now. It must be added that as the world's largest net food exporting region, its agricultural sector's long-term sustainability will play a major role in the world's food security and accessibility in the future. This should be noted by many developed nations such as the United States, which imports more than 80% of fruit from LAC. An already high level of soil degradation means plant cultivation is competing for available land with livestock production and agro-energy, leading to higher rates of deforestation, depletion of water resources, and loss of biodiversity. Thus, if livestock and agricultural exports are to become an engine of growth and employment in the region, governments need to implement policies and incentives that guarantee the long-term sustainability of the systems.

At the same time, LAC countries need to keep their GHG emissions in check, particularly at a time in which COVID-19 has exacerbated poverty issues in the region. This is particularly true given that the agrifood sector in the region supports a large portion of the poorest and most remote communities. The FAO study referred above found that the greatest challenges faced in such systems are “the growing degradation of pastures and a consequent loss of productivity, deforestation, increasing dependency on external inputs, technology and genetic material, high incidence of disease and organizational and marketing weaknesses”.^{lvii}

Latin America, with support from the United States, needs to optimize the use and sustainability of its natural resources and ecosystem services in order to mitigate the environmental impact of the agricultural sector, while at the same time adapting it for a changing and warming climate, through innovative and regenerative agricultural practices. There are proven technological and management strategies aimed at the sustainable intensification of livestock production that simultaneously help prevent deforestation. The region has long under-invested in agricultural research and in yield-enhancing advances that will be needed in the future.

Likewise, local governments should put in place incentives for farmers (which can range from market signals to direct transfers and payment for ecosystem services) to transition to more sustainable and low-impact production systems, as well as provide them with the necessary technical support and technology. This in turn requires on

the one hand, resources and financing, but on the other, that governments develop long-term, integral policy frameworks—considering and harmonizing growth of both plant cultivation and livestock—that harness the technological transformation of the sector taking place in the developed world. This would result not only in more resilient and sustainable agrifood systems with lower carbon footprints, but also in higher productivity of crops, enhanced ecosystem services, and steady jobs and economic growth for LAC nations.

6. Renewable Energy Systems and Innovative Financing Mechanisms

6.1 Latin America's Low Carbon Energy Footprint

The region in the world with the highest share of renewables in its electricity mix is Latin America and the Caribbean—mainly because of hydro power—and it boasts booming renewable energy markets as it enjoys important wind and solar resources in many countries, such as Chile and Mexico, which are among the top countries globally in terms of solar radiation, and which have been invigorated by market-oriented mechanisms and reforms. According to ECLAC figures, renewable energy projects represented 33% of the total investments in the region in 2020. Furthermore, Bloomberg New Energy Finance (BNEF) expects solar and wind added capacity to soar in the next two years with a solid post-pandemic recovery, with new installations in the double-digits in 2021 and over 30GW by 2023.^{lviii}

A report^{lix} by the International Renewable Energy Agency (IRENA) on the *Future of Solar Photovoltaic Energy* highlighted that the region's solar energy capacity alone could grow by a factor of 40 by 2050. To take advantage of these natural endowments, and as a part of the efforts of some governments to meet their climate pledges, in December 2019 a new initiative coordinated by the Latin American Energy Organization (OLADE) announced the regional goal of producing at least 70% of power from renewable sources by 2030. Colombia is leading these efforts and has so far been supported by Chile, Costa Rica, Dominican Republic, Ecuador, Guatemala, Haiti, Honduras, Paraguay, and Peru. In addition, a few Caribbean islands, including Aruba, Dominica, Grenada and Montserrat are already planning on a 100% renewable grid in the future.

Natural resources paired with appropriate policy signals meant that, of the top ten emerging markets that received the most clean energy asset financing in 2019, four were from Latin America: Chile, Brazil, Mexico and Argentina (in order of relevance).^{lx} The last three also made the list of top ten markets (not only emerging) for wind capacity additions in the same year. In fact, Chile has already met its 2025 clean energy mandate target of 20% of generation for utilities and aims for that to be 60% by 2035. Brazil also continues to be one of the main emerging markets for renewable energy deployment (and the largest power market in Latin America) led by competitive clean energy auctions. When looking at the Americas, wind, solar, and hydropower

were likewise the three most installed technologies in 2019, followed by gas (see *Annex A* for a detailed map by BNEF).

Latin America has been largely successful in the use of power auctions to boost renewable energy capacity installations. The small markets of Central America and the Caribbean, as well as larger countries with nascent non-conventional renewable energy sectors, such as Ecuador, could benefit from introducing this mechanism. An analysis^{lxii} by *The Dialogue* from 2020 that looked at government-led long-term power auctions, with participation from non-conventional renewable sources in six LAC countries²¹ since 2015, found that it has brought investments for over USD 46 billion and 32 GW of new installed capacity. The largest share of projects were from wind and solar, at very low prices by international standards. In addition, the number of bids received far exceeded the number of projects awarded in most auctions, indicative of a high level of competition and high demand from private sector participants to invest in these markets.

This should be explored further as a way for the region to crowd in private investment through a mechanism that has proved successful in many countries already. It would help boost the transition, secure clean power supply in a region that will continue to see increasing demand for electricity, and free up public resources and international aid that could be allocated towards other more nascent or less profitable sectors.

6.2 The Role of Hydrogen and Biofuels

Other opportunities exist, particularly in certain Latin American countries, considering the abundance and low costs of renewable electricity, to invest in and grow markets in alternative renewable energy sources, such as green hydrogen and biofuels. Hydrogen, if produced with renewable sources, can help decarbonize hard-to-abate sectors such as maritime, heavy-duty transport, aviation, as well as cement and other high-heat processes of manufacturing (which combined account for over 35% of global energy-related GHG emissions).

By 2030, BNEF projections expect that green hydrogen will be cheaper than blue or gray hydrogen produced using carbon capture technology (see *Annex B* for a detailed cost projection per country by BNEF). This will be the case for Argentina, Chile, Mexico, Peru, and the United States²², where models predict a worst-case scenario of prices below 2.2 USD/kg (or about 16 USD/MMBtus). In the case of Brazil, the worst-case scenario modeled by the report for green H₂ prices will be cheaper even than gray

hydrogen from natural gas, without any type of carbon capture. Green hydrogen could then become a critical piece in the energy revolution.

Many LAC countries are already making serious efforts to expand their hydrogen supply chains, with Chile leading the pack. The Chilean government has a bold plan to ramp up H₂ production and adoption, which includes up to USD 50 million in subsidies in 2021 alone to reduce upfront costs of electrolyzers.²³ They are targeting an increase of up to 25 GW of electrolysis capacity by 2030. As a point of comparison, the entire EU block is targeting 40 GW in the same timeframe.^{lxiii} Brazil, also vying for leadership in the global hydrogen market, announced early 2021 the construction of a 600 million kg plant of clean H₂ using 3.4GW of renewable energy.^{lxiii} The USD 5.4 billion investment is from private sources and the project is scheduled to go online by 2025. Other countries in the region, such as Costa Rica, Trinidad & Tobago, Argentina, and Colombia are also taking strides to become early-movers in this new market.

LAC countries with advanced fossil fuel industries such as Argentina, Brazil, Ecuador, Mexico, Guyana, and Trinidad & Tobago can modernize and incentivize refineries to produce clean hydrogen fuels. By retooling equipment and re-training their workforce, national oil and gas companies in the region can begin to participate in the fuel transitioning efforts. Their know-how coupled with the abundant renewable resources of the region could indeed make LAC one of the world's main suppliers of clean hydrogen energy. In Caribbean Island Nations, there are opportunities too to promote the transition to a highly sustainable tourism sector through adoption of green H₂. Large hotels, cruises and eco-tourism companies would benefit from promoting the role of green hydrogen and biofuels in the maritime industry as well as in the design of sustainable, energy efficient touristic complexes.

However, experts suggest a way to jumpstart supply chains for these new markets could be through less capital-intensive applications, such as green ammonia for fertilizers, biofuels and other early-market applications. This is because H₂ projects are capital-heavy, meaning long-term contracting and high levels of financing are required to cover up-front costs. This necessarily requires legal certainty for investors as well as a strong regulatory framework—factors that are lacking in some LAC countries. As is the case with traditional renewable projects, governments will need to put in place suitable policies (such as regulations, standards, and targets with clear timeframes) as well as to create fiscal incentives, to attract investors and most importantly, be able to assure them that they are in for the long haul.

6.3 Net-Zero Targets, Environmental, Social and Governance Standards, and Innovative Climate Finance

²³ Electrolyzers are needed to produce hydrogen by separating H₂O molecules with the help of electricity. If the electricity used is clean, then the hydrogen produced is considered green, as it has a negligible carbon footprint.

²¹ Argentina, Brazil, Chile, Jamaica, Mexico, and Peru

²² A 2021 analysis by the Boston Consulting Group shows that a \$3/kgH₂ production tax credit for green H₂ would help the U.S. market to grow to as much as double the E.U. market by 2030.

The recent global rush towards net-zero emission targets by private companies and investors will incentivize the creation and adoption of appropriate supply chains, as capital is channeled towards low-carbon projects, products and industries. The EU – and the US government more recently – are now decidedly moving towards more stringent, standardized, requirements on ESG compliance. At the time of writing, the U.S. House of Representatives had recently passed the *ESG Disclosure Simplification Act of 2021* which, if passed by the Senate and signed into law by President Biden, would “direct the SEC to issue rules requiring public companies to disclose ESG metrics in their proxy solicitations and audited financial statements and authorize the SEC to define ESG metrics and to incorporate internationally recognized standards in the definition”.^{lxv} Similarly, the European Union is seriously considering a border adjustment tax levied on carbon intensive imports, and recently released a sustainability classification system to channel private equity to meet the objectives of their *Green Deal*.

On the other hand, the opportunity is also ripe for the LAC region to take advantage of this appetite for green investments and the boom in new climate finance mechanisms, given the availability of carbon sinks, paired with overall loose environmental standards, oversight and compliance, as well as growing emissions in the region. Brazil issued Latin America’s first green bond in 2014 and since then, eleven other countries have followed suit—yet these cover only about a third of LAC nations. Brazil accounts for 48% of total Latin American green bond issuers; Chile, 16% and Mexico, 13%. To date, however, most of these are corporate bonds. Governments, both national and sub-national, have yet to exploit the boom, even though these instruments could allow them to finance large infrastructure projects post-COVID-19, while aligning spending and development with their NDCs. Slowly but surely, these efforts are starting to move forward, beginning with Chile, Colombia and Mexico. These bonds, however, are heavily restricted by a country’s sovereign rating, which may prevent some in Latin America from exploring this financing avenue altogether. Many countries in the region have seen their ratings decline during the COVID-19 crisis.

Aside from green and sustainable bonds, there are other innovative financing mechanisms for climate projects that the region could tap further, such as carbon offsets, debt-for-adaptation swaps and debt-for-nature swaps—which could become valuable instruments to enable the developed world and MDBs to assist developing countries, most certainly those megadiverse ones in Latin America and the Caribbean, fund projects that advance their conditional NDCs and 30X30 initiatives (to protect 30 percent of land and oceans by 2030). Examples are under way in the region, particularly in the forestry and land-use sectors, through first-of-their-kind, result-based agreements for emission reductions and payment for ecosystem services.^{lxv}

Conclusion and Key Takeaways

The transition to net-zero in LAC would avoid costs caused by damages from extreme weather events, and prevent millions of deaths related to health issues and to extreme temperatures, stemming from a warming climate. Furthermore, it would help prevent disruptions that could cause up to 2 million people falling into extreme poverty. The potential stresses on public finances from continuing to rely on carbon intensive incomes and from facing higher costs of capital would also be avoided, and the region would have a net gain of up to 15 million jobs by 2030, per an ILO-IDB study from 2020.^{lxvi}

Furthermore, the implementation of NDCs up to 2030 will be costly, yet it will bring net gains for countries in the long run. Mexico’s NDC implementation cost assessment^{lxvii} from 2018 shows that a Business as Usual scenario would bring reduced economic growth and consumption patterns, coupled with ecosystems and natural capital degradation, that in aggregate would cost Mexico in the order of USD 143 billion. In that sense, achieving its stated unconditional NDCs would bring Mexico a net positive saving of USD 14 billion. It will be much more costly for the region’s economies in the long haul not to implement its climate commitments—more so as the rest of the world transitions, and costs increase the longer governments take to do the same. This is a transition that is already happening and the Americas, which is currently lagging compared with efforts undertaken in many European countries, needs to accelerate efforts to avoid getting left behind.

Strides are being made already in several LAC nations, such as in Barbados, Costa Rica, Chile, and the Dominican Republic, whose scorecards are largely painted in green. Argentina, Ecuador, and Peru are also making significant efforts across the board, yet have a long way to go in committing to a greener recovery and in transitioning away from extractive industries.

Other Caribbean nations are doing what they can with the resources they have. However, increased external financing for adaptation initiatives and capacity building is imperative. In that sense, achieving the ambitious adaptation component in most of these countries’ NDCs will be key to tackle the climate crisis in that part of the world. This has to do with high climate risks and with the availability of vast natural resources that allow for cost-effective nature-based solutions and resilience-promoting measures. There are several successful examples in the region of joint initiatives regarding coral reef conservation and forestry management that should be learned from and applied to other sectors, and to more neighboring countries, as to achieve a truly regional focus. More efficient environmental management can help these nations further their sustainable development goals too. Their contributions towards the rise in global temperatures through GHG emissions is negligible, and many are already paying hefty costs to clean up, and adapt to, extreme weather events. It is also important to note that, to date, their COVID-19 recovery spending

seems to be targeting social relief efforts to tackle the immediate effects of the health crisis. Many of the Caribbean islands are highly dependent on tourism as the main source of income, and as travel ceased, many of their economies were de facto paralyzed. This resulted in higher unemployment and lower household income and spending. That said, other recovery efforts should be focused on building back greener—starting with their tourism industry—, which could become an engine of sustainable growth and resilient economic practices.

Mexico and Brazil, the two powerhouses in the LAC region, and together responsible for half of emissions in LAC, are backtracking on their climate pledges—scoring red in most categories of the scorecard. Being the top and top 12th most megadiverse countries in the world, they have the most to gain from this transition. They could also have the loudest voice at COP26 to rally support for the region, and their share of emissions means they are critical for the region to achieve significant results in mitigating climate change. During September’s *High-Level Dialogue on Climate Action in the Americas*, Argentina and other regional climate leaders aimed to foster dialogue on climate change, in an effort to unify the region’s strategy at COP26. Ecuador’s recently elected Guillermo Lasso rightly pointed out during the summit that, “We need to reach consensus on more ambitious goals. From all actors, not just States.”²⁴

These countries would be well served by having a single voice in Glasgow, understanding that their greatest challenge as a region will be to marshal the necessary resources to implement their NDCs. The LAC region will face a huge fiscal and debt crisis coming out of COVID-19, and paying for the green transition will be harder than ever. Yet, these countries only represent about 7% of global emissions. Given that the benefits of this transition will come only in the future, many of these nations will be tempted to postpone climate action—more so if they do not receive significant international support. It was under that premise that the message that resonated the most during the regional September 2021 summit was the need for the international financial sector at large, including MDBs, to embed new climate criterion in their credit rating and lending processes, as well as to consider alternative debt-relief mechanisms based on ecosystem conservation, biodiversity loss reversal, and emissions mitigation.

Even though the region has historically been on board with climate efforts, with internal support from their constituencies, it has rarely acted in unison to garner stronger support abroad. Getting Mexico and Brazil to embrace the program, and aligning with the U.S. and Canada pre-COP26, will be essential. Both Canada and the United States appear to be showing a renewed commitment to more ambitious climate action through their updated NDCs, and nationally, through the implementation of green legislation and appropriations. It is yet to be seen if this show

of leadership will be long-lived. Regardless, the Biden administration’s priorities and its strong interest in climate change provide a unique opportunity to engage with the largest economy in the Hemisphere on this front.

In that regard, the United States would do well to assess the strategic importance of investing and engaging in climate finance efforts in Latin America. The US has direct economic interests in the resilience of LAC’s agri-food systems (as the US imports more than 80% of its fruits and 85% of vegetables from the region). Moreover, the region is rich in critical minerals—which will all be key in the United States supply chains of the future and crucial for a transition to net-zero. In that sense, special presidential-envoy for climate John Kerry pointed out during his opening remarks during the *High-Level Dialogue on Climate Action in the Americas* that the United States has the vision of a “hemispheric powerhouse of innovation”. This can only happen if the country is willing to engage with the region with sizable time and money commitments. The combined US FY-2022 budget for DFA earmarked for *climate action* for the LAC region was a meager USD 133 million, yet the yearly needs of the region to implement their climate pledges are in the order of billions.

Along the same lines, LAC nations whose risk profiles are limiting the inward flow of private capital, need to work internally to push through institutional reforms to promote transparency and rule of law, to de-risk investments and leverage the available capital that is out there. This would better position many of these emerging markets to leverage external sources of capital to pursue what could potentially be highly attractive projects in sustainable agriculture, tourism and Nature-based Solutions—areas where opportunities abound in the region—. Studies reveal that NbS could provide up to 30% of the cost-effective mitigation needed by 2030. With over 25% of the world’s forest cover, almost half of the tropical forests, and a quarter of mangrove distribution, there is a strong case to invest in the conservation and restoration of LAC’s ecosystems. In addition, the successful examples of conventional and non-conventional renewable energy auctions seen throughout Latin America should be adapted and implemented by other countries in the region due to their natural capital profile, to leverage private capital.

Finally, LAC countries need to align their national budgets to the green transition. On the one hand, by decarbonizing their public finances to lower transitional and fiscal risks, and on the other, by committing more resources of their own. This would send a strong signal to the international community, and would bring countless benefits to their economies and more importantly, their citizens. Financing NDCs and the transition to *Net-Zero* will certainly bring hefty costs for the region, but the cost of inaction will be much greater.

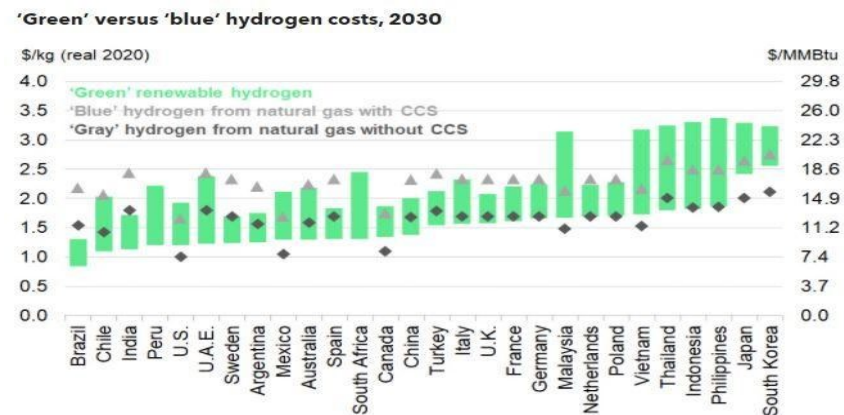
²⁴ From Lasso’s opening remarks on the *High-Level Dialogue on Climate Action in the Americas*, on September 8th, 2021.

Annex A: Electricity Generation – Most Installed Technology in 2019 in the Americas



Source: BloombergNEF. Note: Map colored by which technology was most installed in 2019 a

Annex B: Cost Projections of Green H2 per Country by 2030



Source: Bloomberg New Energy Finance.

²⁵ Assumes optimistic BNEF's electrolyzer cost scenario. Renewable H₂ cost range reflects a diversity of electrolyzer types (from Chinese alkaline – low – to PEM – high). Assumes equal CCS costs in all countries.

Appendix 1

Countries profiled in our report



Argentina



Barbados



Brazil



Canada



Chile



Colombia



Costa Rica



Dominican Republic



Ecuador



Guyana



Haiti



Jamaica



Mexico



Peru



Trinidad & Tobago



USA

About the Author



Tania Miranda is the Director of Policy & Stakeholder Engagement for the Institute of the Americas' Environment & Climate Change Program. She has over 6 years of experience with multiple Mexican government agencies at the federal level, including the Ministry of Foreign Affairs, ProMexico, and the Mexican Embassy in Washington D.C. Prior to the Institute, Tania worked as an Investment and Economic Analyst at the Consulate of Mexico in New York, focusing on the promotion of the U.S. – Mexico – Canada Trade Agreement as well as energy, infrastructure, and tourism-related projects. She also has experience working as an energy liaison for the Kuwaiti government in Mexico. Tania studied a Bachelor of Arts in Economics with a Minor in International Relations at the University of Southern California, where she graduated Magna Cum Laude, and a Master's of Science in Energy Policy & Climate from the Johns Hopkins University. She has published an array of research and opinion pieces on the energy sector, and co-authored a published book titled *We Are North America*.

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About the Environment & Climate Change Program

This initiative strives to catalyze climate leadership amongst the private sector and sub-national governments in Latin America, to promote sustainable growth, tackle climate change and minimize environmental impacts in the region.

About the Institute of the Americas

Established in 1981, the Institute of the Americas is an independent, nonpartisan Inter-American institution devoted to encouraging social and economic reform in the Americas, broadening communication and strengthening political and economic relations between Latin America, the Caribbean, the United States and Canada. For more information, please visit: <https://iamericas.org>.

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