

COMMON FRAMEWORK OF SUSTAINABLE FINANCE TAXONOMIES

FOR LATIN AMERICA
AND THE CARIBBEAN



Food and Agriculture
Organization of the
United Nations



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FOR LATIN AMERICA AND THE CARIBBEAN

JULY 2023

**PHASE I. CLIMATE CHANGE MITIGATION
AND ADAPTATION**

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List of abbreviations

AFOLU	Agriculture, forestry, and land use
APF	Adaptation Policy Frameworks for Climate Change
ASEAN	Association of Southeast Asian Nations
BIS	Bank for International Settlements
CAF	Development Bank of Latin America
CAIT	Climate Analysis Indicator Tool
CBI	Climate Bonds Initiative
CELAC	Community of Latin American and Caribbean States (CELAC)
CFU	Climate Funds Update
COP	Conference of Parties (Climate Change Conference)
DDP	Deep Decarbonization Pathways
DNSH	Do no significant harm
EC	European Commission
ECLAC	Economic Commission for Latin America and the Caribbean
EDGE	Excellence in Design for Greater Efficiencies
EDL	Direct Lithium Extraction
ELECTRE	Élimination et Choix Traduisant la Réalité
eq	Equivalent
ETS	Emissions trading systems
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GEF	The Global Environment Facility
GFLAC	Climate Finance Group of Latin America and the Caribbean
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ICT	Information and Communications Technology
IDB	Inter-American Development Bank
IEA	International Energy Agency
IFC	International Finance Corporation
IMF	The International Monetary Fund



IPCC	Intergovernmental Panel on Climate Change
IPSF	International Platform on Sustainable Finance
ISIC	International Standard Industrial Classification of All Economic Activities
LAC	Latin America and the Caribbean
LCE	Life Cycle Emission
LEED	Leadership in Energy and Environmental Design
LULUCF	Land use, land-use change, and forestry
MCDA	Multi Criteria Decision Analysis
MM	Million
Mt	Megatonne
NACE	Nomenclature des Activités Économiques dans la Communauté Européenne
NAPA	National Adaptation Programmes of Action
NDC	Nationally determined contributions
ND-GAIN	Notre Dame Global Adaptation Initiative
NGFS	Network of Central Banks and Supervisors for Greening the Financial System
OECD	Organisation for Economic Co-operation and Development
PCB	Polychlorinated biphenyls
PED	Primary Energy Demand
SIDS	Small Island Developing States
SME	Small and medium enterprise
SUDS	Sustainable Drainage Systems
TEG	EU's Technical Expert Group
TSC	Technical Screening Criteria
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNEP FI	United Nations Environment Programme Finance Initiative
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations International Children's Emergency Fund
USD	United States Dollar
WB	World Bank
WBG	World Bank Group
WMO	The World Meteorological Organization
WRI	World Resources Institute
WWF	World Wildlife Fund

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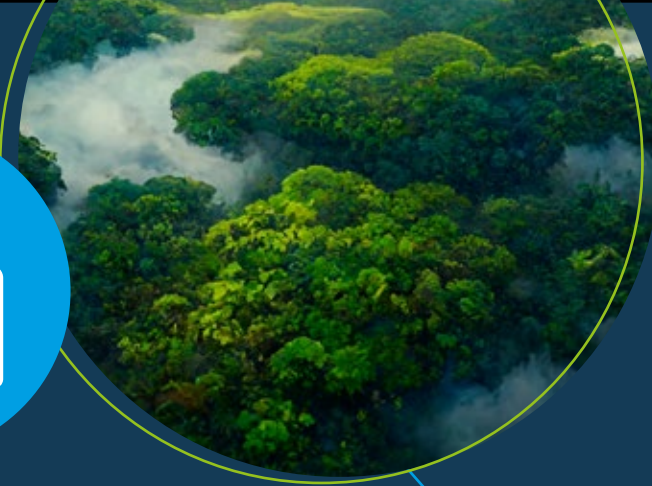


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FORUM OF MINISTERS
OF ENVIRONMENT
OF LATIN AMERICA AND THE CARIBBEAN

40
YEARS

The Forum of Ministers of Environment of Latin America and the Caribbean

The Forum of Ministers of Environment of Latin America and the Caribbean (“the Forum”), established by the Ministers of Environment of the region in 1982, is the **most important space for political dialogue and cooperation between the governments of the region regarding the environmental agenda.**

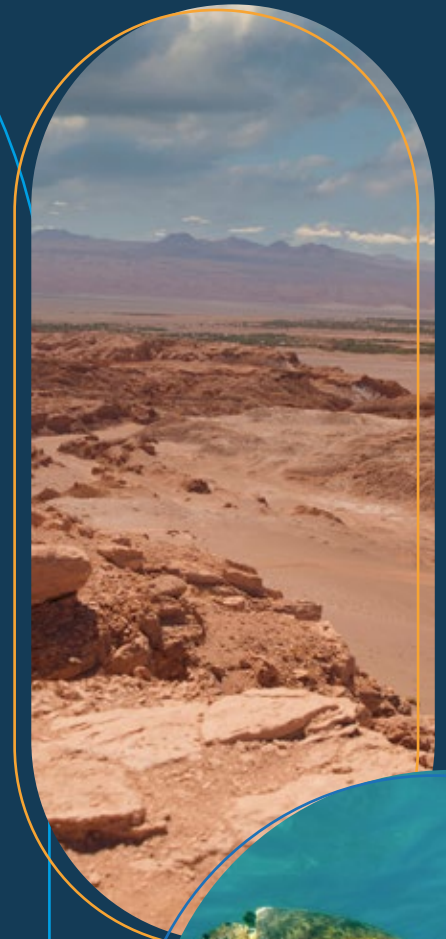
It also serves as the regional gathering for discussion and preparation of consolidated views and inputs from the region to the United Nations Environment Assembly (by UNEA Resolution 2/2 of 2016) and provides inputs on the environmental dimension to the Forum of Countries of Latin America and the Caribbean on Sustainable Development (ECLAC Resolution 700 (XXXVI)).

UNEP’s Latin America and the Caribbean (LAC) Office serves as the secretariat to the Forum.

In this way, the Forum serves to address the environmental priorities of the region, while also linking the regional work with the global environmental and wider sustainable development agenda.

The Forum has an **Interagency Technical Committee (ITC)** currently comprised by the United Nations Development Programme (UNDP), the Economic Commission for Latin America and the Caribbean (ECLAC), the Interamerican Development Bank (IDB), the World Bank (WB), and UNEP.

The ITC meets periodically and provides advisory services and technical support to the Forum.



Photos: CCU



The Working Group on Sustainable Finance Taxonomies in Latin America and the Caribbean

The Working Group on Sustainable Finance Taxonomies in Latin America and the Caribbean (LAC Taxonomies Working Group) was built as part of the ITC of the Forum and is constituted by the United Nations Environment Programme (UNEP), its Finance Initiative (UNEP FI), United Nations Development Programme (UNDP), International Monetary Fund (IMF), World Bank (WB), International Finance Corporation (IFC), Inter-American Development Bank (IDB), Economic Commission for Latin America and the Caribbean (ECLAC), Development Bank of Latin America (CAF), Food and Agriculture Organization of the United Nations (FAO), and the European Commission, as external technical advisor.

The objective of the LAC Taxonomy Working Group is to promote regional dialogue to support LAC countries in developing sustainable finance frameworks that are interoperable across LAC jurisdictions and internationally.

The LAC Taxonomies Working Group has acted as the Steering Committee of the technical development of the report “Common Framework of Sustainable Finance Taxonomies for Latin America and the Caribbean”, which will serve as a technical input document prepared for the XXIII Forum of Ministers of Environment of Latin America and the Caribbean, under the Costa Rica Presidency.

This guidance can help inform the policy advice, technical assistance, and capacity building support provided by participating organizations.

To further advance regional and international interoperability of taxonomies, international cooperation plays a key role in the LAC Taxonomy Common Framework’s implementation. In this context, the Guiding Principles are being presented at relevant high-level fora across the globe. One first example is the EU-CELAC Summit (“the Summit”) of Heads of State and Governments of the Community of Latin American and Caribbean States (CELAC) (Brussels, July 2023), strengthening the bi-regional partnership of the EU and the CELAC countries on shared priorities such as the green transitions, the fight against climate change and biodiversity loss, health, food security, migration, security and governance.

The Working Group on Sustainable Finance Taxonomies in Latin America and the Caribbean welcomes the Common Framework of Sustainable Finance Taxonomies for Latin America and the Caribbean.



The climate and environmental emergency represents an unprecedented global crisis that requires urgent and ambitious action by all actors in society in order to protect lives, livelihoods, and assets. Communities and businesses in the Latin American and Caribbean's region (LAC) are already beginning to feel the impact of climate change and environmental degradation and will need to understand, mitigate, and adapt to, the risks and opportunities that come from a changing climate.

The United Nations Environment Programme Finance Initiative (UNEP FI) collaborates with more than 500 banks and insurers with assets exceeding US\$100 trillion globally that work collectively across the financial system to deliver more sustainable global economies. These include banks and insurers based and involved in the economic and social development of the LAC region that critically need policy and regulatory guidance, tools, and targets to help drive their finance decisions towards more sustainable economic activities.

In this regard, UNEP welcomes the LAC Common Framework of Sustainable Taxonomies and commends the collective effort. It offers a central and truly unifying transition tool, shedding light on the business opportunities of today and tomorrow for countries, finance institutions and companies in the region. Such leadership can be a source of inspiration for other jurisdictions across the world. We look forward to continuing to support the development of the sustainable finance agenda in the LAC region, jointly with our Members and partners.



Eric Usher, Head of the UNEP Finance Initiative, UNEP



Piedad Martin, Regional Officer for Latin America and the Caribbean, UNEP



The Latin America and Caribbean region is home to some of the most biodiverse ecosystems on the planet. However, it is also heavily dependent on extractives industries and sectors that depend on natural resources and ecosystems. Climate change poses a significant threat to the region, exacerbating the impact of poverty and inequality. To address the needs of present and future generations, the region must mobilize substantial amounts of finance.

The United Nations Development Programme (UNDP) is proud to be a partner in the Common Framework of Sustainable Finance Taxonomies for Latin America and the Caribbean. The initiative is the result of inter-agency collaboration to provide guidance to actors in the public and private sector. The aim is to establish locally relevant yet internationally comparable and interoperable taxonomies to promote the flow of sustainable finance in the region. By applying the G20 principles of aligning approaches and methodologies, the Common Framework will facilitate sustainable finance flows and contribute to global efforts towards boosting Sustainable Development Goals (SDG) financing.

The Common Framework is instrumental in unlocking larger volumes of sustainable finance across the region and ensuring such flows contribute to the region's economies, communities, and the environment for a resilient future.



Michelle Muschett,
Regional Director for
UNDP in Latin America
and the Caribbean



Marcos Neto,
Director, Sustainable
Finance Hub UNDP

As we embark on a new era of climate action, it is crucial to understand the importance of climate finance in addressing the global challenges we face. At the International Finance Corporation (IFC), we recognize the urgency of the situation and are committed to mainstreaming climate finance in emerging countries.

In this regard, we are proud to have collaborated with the United Nations Environment Programme (UNEP) and other institutions to create a common framework aiming to establish green finance standards in Latin America and the Caribbean. Creating a guideline to compare different national green taxonomies is of utmost importance to IFC, and we are proud to have played a role in developing this vital document.

Latin America and the Caribbean has been leading the charge in creating an enabling environment for green finance and mitigating greenwashing. IFC is currently working on taxonomies in nine countries in the region, and we are confident that our expertise and lessons learned, as reflected in this document, will support more countries to define green finance standards and significantly increase investment in climate-positive economic activities and assets.

This report marks a significant milestone in the ongoing effort to address climate change in Latin America and the Caribbean. It serves as a reminder of the critical role that collaboration, innovation, and concerted efforts across countries play in achieving a sustainable future for all. At a time when the urgency of the climate crisis is becoming increasingly apparent, it is more important than ever to take action and work together towards a common goal.

The findings and recommendations presented in this report will undoubtedly serve as a valuable resource for policymakers, investors, and other stakeholders committed to driving positive change in the region. We at IFC are proud to have played a part in this important endeavor and remain fully committed to supporting our partners in building a more sustainable and resilient future for all.



Alfonso García Mora,
Vice President for Europe, Latin
America and the Caribbean





Climate change results in financial risk and has severe economic impacts in Latin American and Caribbean countries, that is why more ambition and an increase of capital flows are needed to meet the Paris Agreement goals. “The Region could benefit from a common framework for taxonomies. It will help align investments with the countries’ environmental priorities and sustainable development plans and redirect earmarked budget from the public sector towards more sustainable activities.



Juan Pablo Bonilla, Manager of the IDB’s Climate Change and Sustainable Development Sector



Taxonomies strengthen the foundations of the sustainable finance agenda – financial investors will benefit from these standardized criteria for sustainable investments, as they adapt their practices to a single set of regulations which will reduce costs, make it easier to comply with environmental regulations and ultimately enhance investor confidence. Latin America and the Caribbean’s sustainable capital markets expanded to \$32.4 billion in 2022, yet remain under 4% of global markets. Harmonized regional taxonomies will be key enablers in scaling climate-aligned finance and essential for determining whether investments in these activities are aligned with climate goals. Due to regional and sectoral variations, routes to transition will be different across jurisdictions and industries – for this reason having a consistent set of principles is key to ensure activities are aligned with Paris goals. This publication establishes principles for creating consistent national taxonomies across the LAC region.



Susana Cordeiro Guerra, Manager of the IDB’s Institutions for Development Sector



UNITED NATIONS

ECLAC

The countries of Latin America and the Caribbean face enormous economic, social, and environmental challenges, which require investing much more than the current 19% of the region's GDP. But not only the volume of investment is relevant, but also its destination, which must be transformative of the productive sector, making it more efficient, sustainable, and competitive in the markets of an increasingly present future. For this, the transition of the financial system towards sustainability is key and the taxonomy is the foundational instrument for this transition. This proposal for a Common Framework aims to be a technical contribution to the dialogue between the authorities responsible for coordinating the growing number of taxonomy initiatives in the region. A dialogue that is convenient to harmonize, as far as possible, the methodologies of these taxonomies, with which potential investors can reduce their transaction costs, making capital markets in Latin America and the Caribbean more attractive. This document is a contribution of international organizations operating in the region, a team effort of which ECLAC is very satisfied, hoping that it will be useful to financial regulators in the region.



José Manuel Salazar-Xirinachs
Executive Secretary of ECLAC

CAF, development bank of Latin America and the Caribbean, has the mandate of its shareholders to become the green bank in the region, having assumed the commitment that 40% of its approvals in 2026 are linked to the fight against climate change and its impacts, the conservation of biodiversity and the protection of the environment.

To this end, CAF is refining its corporate strategy with strategic initiatives to strengthen the technical and financial support it provides to countries for the fulfillment of their climate, biodiversity and sustainable development commitments.

One of the institutional priorities is the establishment of a robust green taxonomy, aligned with international standards, especially those applied by multilateral banks, and which converges in its fundamental aspects with the taxonomy being developed by the working group on Sustainable Finance Taxonomies in Latin America and the Caribbean.

CAF believes that the categorization should reflect the uniqueness of the region's environmental challenges and that its correct application, as well as monitoring and verification mechanisms, are key to a green action characterized by environmental integrity, which promotes the well-being of the population.



Alicia Montalvo Santamaría,
Manager of Climate Action and Positive
Biodiversity and Corporate Vice
President of Strategic Programming



Food and Agriculture Organization of the United Nations

The coordination of efforts by multiple actors and sectors is essential to advance on the path towards compliance with the 2030 Agenda.

For FAO, the transformation of agro-food systems constitutes one of the central axes in the development agenda; and having conceptual frameworks, that guide the design of policies will contribute to improving their efficiency, inclusiveness, resilience and sustainability in the face of the climate crisis.

In this context, the “Common Framework of Sustainable Finance Taxonomies for Latin America and the Caribbean” seeks to support, through an evidence-based approach, the identification of sectors and activities with low-carbon emissions and compatible with the decarbonization of economies. .

The mobilization of resources and investments from the private sector for the implementation of programs that include climate change adaptation and mitigation measures is becoming a relevant issue for the region, especially due to its high vulnerability to climate change.

This document presents an analysis of how sustainable finance taxonomies can contribute to closing socioeconomic gaps and protecting the environment through the transformation of agro-food systems.



Mario Lubetkin, Assistant Director-General
y Regional Representative for Latin America
and the Caribbean, Food and Agriculture
Organization of the United Nations

A handwritten signature in blue ink, appearing to be 'M. Lubetkin', written in a cursive style.



Unlocking sustainable finance is a global imperative that holds the key to bridging the financial gap for achieving the SDGs and meeting the ambitious objectives of the Paris Agreement. To transform our world and pave the way for a greener, fairer, and more sustainable future, we must harness the potential of private capital and channel it where it is most needed as public funding alone will not suffice. The European Union's Global Gateway drives this vision, forging resilient connections and sparking high-quality and infrastructure investments worldwide. To mobilise local and international private capital at scale towards sustainable investments, we must foster an ecosystem that supports sustainable finance through trust and clarity in the market.

Credible sustainable finance frameworks are essential to steer investments toward our shared goals. This is crucial for the Latin America and Caribbean (LAC) region, as it aims for a green and sustainable transition while mitigating the current and future severe impacts from climate change. We applaud the progress achieved with this Common Framework, a remarkable milestone for LAC's sustainability journey, building on international and EU good practices. I am convinced that it will help LAC countries develop credible taxonomies, providing the necessary clarity and credibility to local, international, and EU investors, thus facilitating the mobilisation of private capital for the much-needed sustainable investments.

At the European Commission, we take pride in having supported the development of this Common Framework through our EUROCLIMA+ Programme and our EU technical expertise. In the context of the EU-CELAC Summit in Brussels, 17-18 July 2023, and the preparatory work on a Global Gateway Investment Agenda, we stand ready to continue working with our LAC partner countries in developing robust frameworks, ensuring confidence and transparency, and attracting EU and international private capital for green and sustainable projects. In addition, we also provide support to develop the green bond markets in our partner countries as they are a key tool to mobilise private capital for climate and environment projects.



Félix Fernández-Shaw, Director
for Latin America and the Caribbean,
European Commission

A handwritten signature in blue ink, consisting of a stylized, cursive script that reads "F. Fernández-Shaw".

Executive summary

The increase in Greenhouse Gas (GHG) emissions due to human activities over the past two centuries has resulted in significant changes to the climate leading to global warming that is affecting communities and ecosystems across the world. The Paris Agreement of 2015 sets a goal to limit global warming ideally to less than 1.5°C by the end of this century. The current levels of ambition of climate policies and investments globally are insufficient to meet these goals. Additionally, climate models and scientific evidence have established with high confidence that countries in Latin America and the Caribbean (LAC) are highly vulnerable to the effects of climate change.

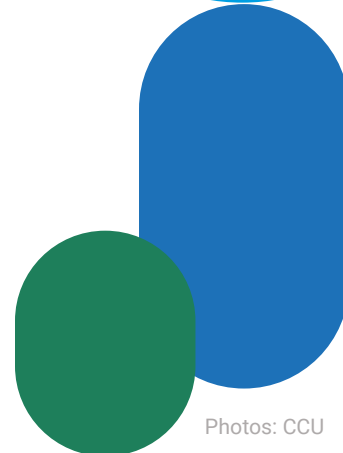
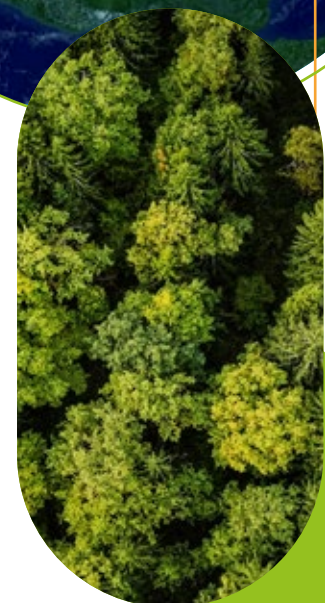
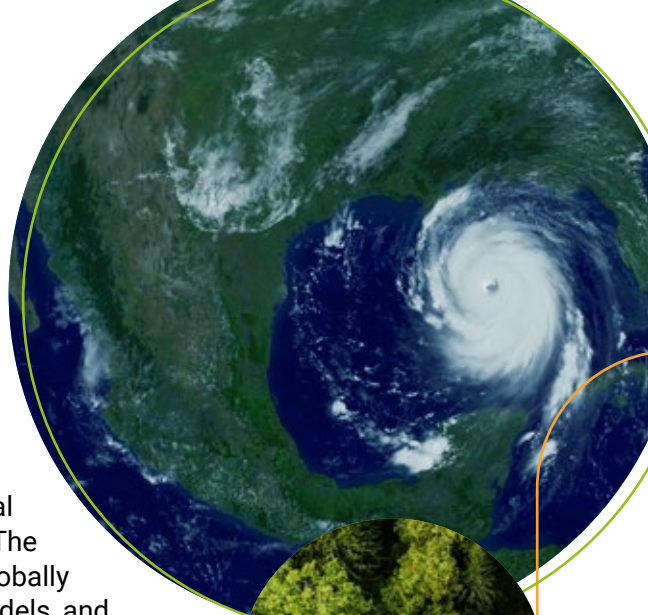
To meet the goals of the Paris Agreement, to transition towards a low-carbon development by decarbonising the sectors and to improve adaptation and resilience of countries in LAC, it is necessary to increase capital flows towards low-carbon and climate change resilient projects.

Taxonomies provide clear definitions that are based on science, help avoid greenwashing and help identify eligible assets, activities or projects that are low-carbon or compatible with low-carbon economic development and/or environmentally sustainable. Taxonomies are being developed globally and in the LAC region at a rapid pace and a lack of comparability could create hurdles for trade and international capital flows towards low-carbon projects.

This paper presents a Common Framework for Sustainable Finance Taxonomies for LAC countries (LAC Taxonomy Common Framework), which is intended to be a guidance document that can serve as a voluntary reference to orient different actors in the region (government and policy makers, development agencies or any other stakeholder) that are in the process of or intend to develop taxonomies in the region. The LAC Taxonomy Common Framework aims to provide guidance for interoperability of taxonomies within LAC and globally.







Interoperability implies that taxonomies must be based on similar guiding principles, have design elements such as objectives, classification systems for sectors and activities that are comparable and are similar in approaches and methodologies used for defining eligibility. The Guiding Principles established in this report helps achieve interoperability and ensures that the taxonomies are based on science.

This report prioritises sectors based on the objectives of climate change mitigation and adaptation for LAC. It additionally provides guidance for inclusion of activities, as well as guidelines for the definition of metrics and thresholds for certain sectors of the taxonomy. The LAC Taxonomy Common Framework also provides guidance and considerations for Do No Significant Harm (DNSH) requirements for other environmental objectives and minimum social safeguards, but the substantial contribution to other environmental and social objectives are expected to be developed in future and is not part of the current report. The following table provides clarity on the scope of this report:



Photos: CCU

Table 1: Scope of the LAC Taxonomy Common Framework - Phase 1

IS/Covered in scope	IS NOT/Not covered
 <p>Set of principles and framework for national and regional taxonomies in LAC</p>	<p>Not a regional taxonomy</p>
 <p>Focused on objectives of climate change mitigation and climate change adaptation</p>	<p>The other environmental and social objectives will be developed in future. However, guidance has been provided from a DNSH perspective and minimum social safeguards</p>
 <p>Provides an assessment and prioritisation of key economic sectors</p>	<p>Does not select sectors or activities for national taxonomies</p>
 <p>Provides guidance on selection of activities</p>	<p>Does not select activities for taxonomies</p>
 <p>Provides guidance on methodologies for selection of metrics for defining screening criteria</p>	<p>Does not establish metrics or thresholds for taxonomies</p>
 <p>Provides guidance on process of taxonomy development and governance structures</p>	<p>Does not prescribe processes or governance structures for LAC countries</p>

1. Introduction

Global context

Scientific evidence has established that increase in GHG emissions during the past two centuries that is unequivocally caused by human activities has warmed the atmosphere, oceans, and land at an unprecedented rate. This has resulted in significant changes in climate that is already affecting many weather and climate patterns across the globe. Heatwaves, heavy precipitation, droughts, and tropical cyclones are increasingly prevalent, and these changes are affecting natural capital and economies globally. These climate extremes have resulted in irreversible damage to ecosystems and communities (IPCC 2022).

Average global temperatures have increased by over 1°C above pre-industrial levels due to rise in GHG emissions. These emissions are projected to peak between 2020 and 2025 and, if policies are not strengthened beyond those already implemented by the end of 2020, GHG emissions are projected to increase beyond 2025, leading to an average global warming of 3.2 (2.2 to 3.5) °C by 2100 (IPCC 2022).

The Paris Agreement of 2015 set a target to limit global warming to well below 2°C and preferably below 1,5°C by the end of the century (UNFCCC 2021). According to the climate models of the International Panel on Climate Change (IPCC), to maintain the temperature rise below 1,5°C, it is necessary to reduce anthropogenic emissions by at least 45% compared to 2010 by 2030 and reach zero net emissions by 2050. Hence, prioritising immediate climate change mitigation (reduction of GHG emissions) and climate change adaptation (improving adaptability and resilience) actions are necessary to avoid the risk to natural capital, human health and safety, quality of life with an increasing emphasis on low-carbon economic development.

Climate change also results in financial risk and has severe economic impacts. The Global Turning Point Report released during the World Economic Forum in 2022 indicates that unchecked climate change could cost the global economy US\$178 trillion over the next 50 years, but also projects that if global leaders unite in a systemic net-zero transition, the global economy could see new five-decade gains of US\$43 trillion by 2070 (Deloitte 2022).



Photos: CCU

LAC context

The 26th Conference of the UN Framework Convention on Climate Change (UNFCCC), highlighted the importance of LAC region which hosts 40% of the world's biodiversity, 10% of the coral reefs, 12% of mangrove forests, and large expanses of wetlands critical for natural ecosystems (IDB 2021). Despite the diversity for LAC countries, the climate change situation is no different.

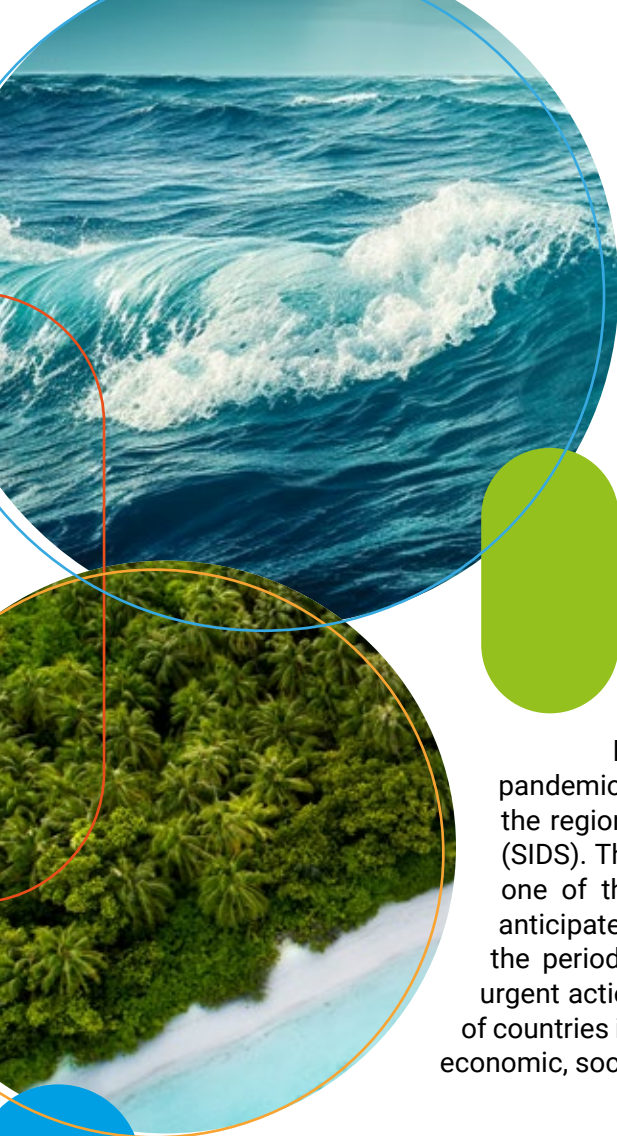
The region is increasingly experiencing extreme meteorological events such as tropical cyclones, heavy precipitation and flooding, droughts, and heatwaves, which have caused significant economic losses and water insecurity for communities. For example, the impact of hurricanes Iota and Eta (category 4) in 2020 was estimated to have left tens of billions of dollars in damage (World Bank Group 2022). Floods in the Brazilian Amazon have also been estimated to have caused an economic loss of US\$40 million for the rural sector (WMO 2022), and it is generally expected that up to 30% of GDP could be lost in the Caribbean and Central America and approximately 19% for South America by the end of the century, given the materialisation of the effects of climate change (ECLAC 2020).

The extreme events to which the region is exposed have caused not only socio-economic damage in the region (damage to crops and infrastructure) but also human losses (UNEP/DEWA/GRID Europe 2005)¹. In this regard, the World Meteorological Organisation's (WMO) latest report for LAC, highlighted different extreme events that have affected the region; for example, a series of floods in Panama affected 27,500 people and tropical storms (later Hurricanes) affected several territories in the Caribbean. Also, in 2021, droughts have affected several countries in the region, mainly Mexico, Chile, and the Paraná–La Plata Basin, causing impacts mainly on agriculture, due to water stress. Heat waves were also recorded, and more than 300,000 active fires were detected in the region, of which approximately 60% were in Brazil (WMO 2022). Heavy rainfall and torrential floods in the Andean countries such as in Colombia cause landslides frequently affecting settlements (RTVC 2022). Furthermore, The World Bank Group in 2022 indicated that without climate action, in LAC, almost 6 million people could fall into extreme poverty by 2030 and more than 17 million people could be forced to migrate due to the severe effects of climate change by 2050. (WWF 2021).

The LAC region has thus been classified as “highly exposed, vulnerable and strongly impacted by climate change” in the IPCC reports of 2022 and the situation is amplified by inequality, poverty, population growth and high population density. The mean temperature in the region will continue to increase at rates greater than global average and the marine heatwaves are projected to increase around the region, negatively impacting ocean, coastal and terrestrial ecosystems. This situation will be further affected by changing precipitation patterns across the region, and the reports indicate with high confidence that the South American monsoon will be delayed in the 21st century (IPCC 2022).

Due to existing inequalities and multidimensional social factors, environmental challenges have differentiated impacts of climate change on people. Unequal access to and control of financial resources, land tenure and unequal power relations, gender inequality, among others can lead to increased vulnerability.

1. Hurricane Jeanne is estimated to have caused the death of more than 2,754 people in Haiti and is, so far, the most devastating in the history of Latin America and the Caribbean.



The region of South Atlantic has also seen relative sea level rise at a higher rate than global mean level over the past three decades, and this increase is extremely likely to continue in the region contributing to coastal flooding in low-lying areas. The small island nations in the region are specifically at risk with sea level rise adversely affecting the freshwater resources of the largely coastal population. The Andes Cordillera is expected to continue facing glacier volume loss and permafrost thawing, causing important reductions in river flow and potentially high-magnitude glacial lake outburst floods (IPCC 2022).

According to the latest analysis of the Economic Commission for Latin America and the Caribbean (ECLAC), extreme events, in particular persistent drought, have exacerbated the damaging impact of the COVID-19 pandemic on the social and economic prospects of the countries in the region, especially the Caribbean small island developing states (SIDS). The accumulated losses of tourism sector in the Caribbean, one of the major drivers of economic growth in the region, are anticipated to range between US\$ 53 billion and US\$ 75 billion during the period 2020 to 2023 (ECLAC 2021). This raises the alarm for urgent action to mitigate GHG emissions and to increase adaptability of countries in the region to avoid tragic consequences that threaten the economic, social, and environmental well-being.

Paris Agreement

Photos: CCU

To address climate change and to structure more effective mechanisms to address the challenge, the Paris Agreement was established on 12th December 2015. This international agreement aims to limit global warming to well below 2°C and preferably below 1.5°C by the end of the century by making the signatory countries strengthen their response to the threat of climate change by working on three main areas: mitigation, adaptation, and financing (UNEP 2016). The Paris Agreement constitutes a landmark achievement in the international response to climate change, as developed and developing countries alike committed to do their part in the transition to a low-emission and climate-resilient future.

The Nationally Determined Contributions (NDCs) are the core of the Agreement, and they are self-imposed national goals to reduce greenhouse gas emissions according to country-specific characteristics and capacities.

As a region highly vulnerable to the impacts of climate change, Latin American countries have demonstrated their commitment to the goals of the Paris Agreement to reduce GHG emissions. Countries are increasingly recognising gender inclusion as a key component for achieving the climate goals and have started to include this in the NDC implementation strategies (UNFCCC 2021). Most of the countries have formulated and updated NDCs and are working towards their mitigation and adaptation goals. As of 26 October 2022, from the 166 latest available NDCs, 29 of the 33 countries in LAC region have submitted the NDCs to UNFCCC; nine (9) of



Photo: CCU

them upgraded since 12 October 2021 and six (6) of which after COP 26² (UNFCCC 2022). Saint Vincent and the Grenadines and Trinidad and Tobago are expected to submit during the third quarter of 2022, while a submission from the Bahamas is expected later in the year. It is not clear when Guyana will submit an updated NDC (UNDP 2022).

Based on the Quality Assurance Checklist established by UNDP to systematically review opportunities to improve NDC quality against three dimensions of i) Robustness, ii) Feasibility, and iii) Ownership and Inclusivity, the LAC region scored higher than the global average on all three dimensions of NDC quality (UNDP 2022). Even so, these policies are not sufficient and the NDCs fall short of the ambition established by the Paris Agreement.

There is an increasing urgency to mobilise preferential capital towards investments that are aligned with science-based decarbonisation definitions, and taxonomies can help establish this technical framework to avoid greenwashing.

The Paris Agreement further presents a strong mandate for full, equal, and effective participation of women in climate actions and responses, gender equality, empowerment of women and human rights approaches to ensure no one is left behind. The Agreement also highlights the relationship that climate actions, responses and impacts have on achievement of SDGs. The 2030 Agenda for Sustainable Development recognises that achieving gender equality and empowering women and girls will contribute to the realisation of the 2030 Agenda.

Climate finance

Climate finance³ flows have been distributed slowly and unequally across regions and sectors (IPCC 2022). According to the global distribution of climate finance of both public and private resources, 75% of all climate finance was concentrated in North America, Western Europe, and East Asia & Pacific (primarily led by China). Regions with low- and middle-income countries received less than 25% of climate finance flows (Climate Policy Initiative 2022), and, specifically, the LAC region received only 6% of the global total allocated finance (Climate Policy Initiative 2021).

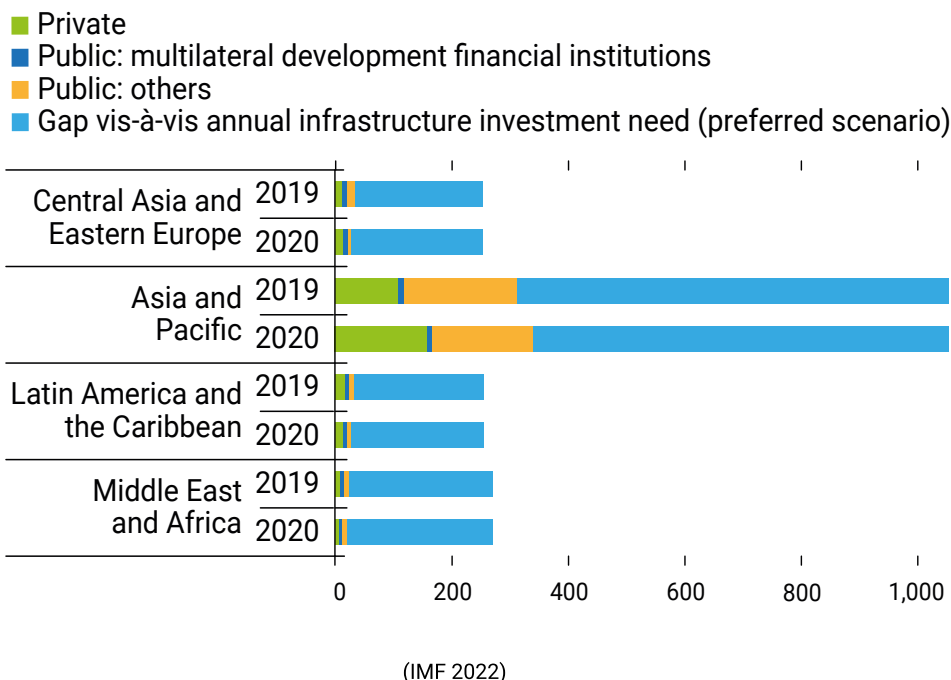
In the LAC region particularly, there has been a significant investment gap for both mitigation and adaptation infrastructure investments. This is more prominent for adaptation despite the high vulnerability in the region (IMF 2022). This is shown in the following illustration:

2. Argentina, Bolivia, Brazil, Dominica, El Salvador, Guatemala, Haiti, Saint Kitts and Nevis, and Venezuela

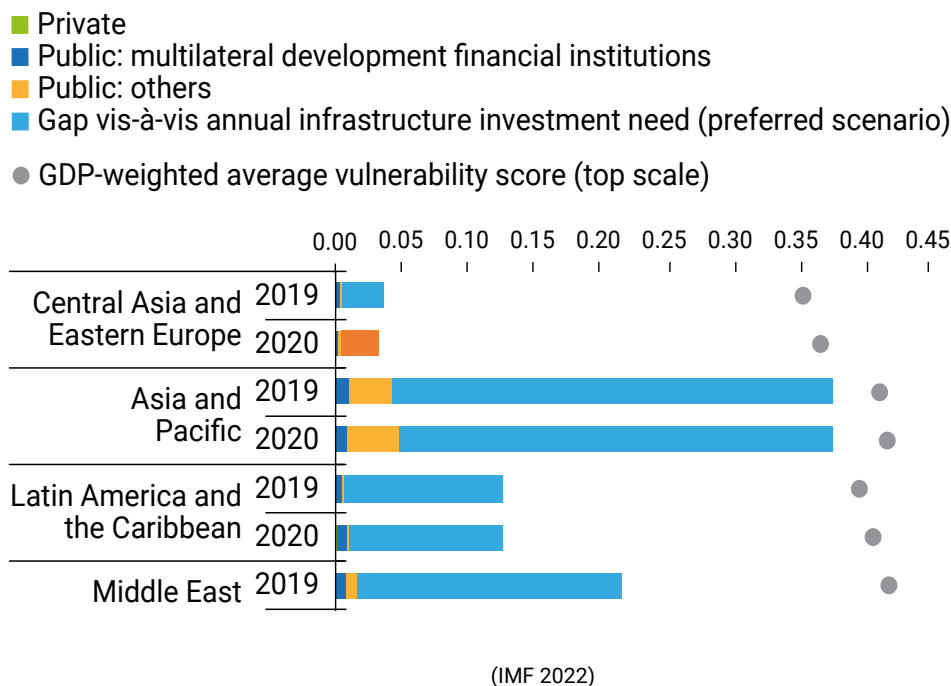
3. According to UNFCCC, Climate Finance refers to local, national or transnational financing—drawn from public, private and alternative sources of financing—that seeks to support mitigation and adaptation actions that will address climate change.

Figure 1: Mitigation and adaptation finance flows and investment gap

1. Global Climate Finance Flows in Mitigation and Infrastructure Investment Needs by Region (Billions of US dollars)



2. Global Climate Finance Flows in Adaptation, Infrastructure Investment Needs, and Vulnerability Score by Region (Billions of US dollars, bottom; score, top)





According to the latest data of ECLAC, since 2013, the flow of climate finance in the region has been in the order of US\$20 billion per year⁴, while in East Asia and the Pacific it has been in the range of US\$292 billion per year (Climate Policy Initiative 2021).

On the other hand, according to the Climate Finance Group of Latin America and the Caribbean's (GFLAC) sustainable income ranking⁵, in 2019, the results for the variable "Sustainable Income" shows inequality in terms of the allocation of development financing dedicated to climate change in the region. Most climate finance in the region is concentrated in just six countries⁶ (GFLAC 2020).

Climate finance mechanisms have not yet incorporated gender sensitivity considerations completely. Low participation of women in developing climate policies, reduced access to credits, and opportunities for climate finance cause gender disparities. Climate finance approaches should be gender sensitive to yield more effective and efficient outcomes as well as promote sustainable development. Gender responsive budgeting can also help address budgetary gaps, ensure greater accountability, and promote gender equality goals.

Also, according to Climate Funds Update (CFU), mitigation activities receive six times more funding than adaptation activities from multilateral climate funds, with US\$ 3.1 billion and US\$ 500 million, respectively in LAC. This situation is particularly alarming in Island States in the region, where it is urgent to focus investment efforts on capacity building and adaptation strategies (IPCC 2022). Finally, responding to the climate crisis in the LAC region require various social and resilient infrastructure expenditures ranging from 7% to 19% of the region's GDP by 2030 (IDB 2022) which is almost 65 times more than the climate finance distributed in the region in 2019. This shows the urgent need to increase capital flows focused on low-carbon development and for improving adaptation and resilience of the LAC countries.

Photos: CCU

4. According to Climate Policy Initiative, the Latin America and Caribbean countries receive US\$ 35 billion per year of financial flows of climate assistance.

5. The sustainable income ranking evaluates the allocation of climate finance, specifically to revenues obtained from development finance from bilateral and multilateral sources to addressing climate change in the LAC countries (multiple actors). This information is taken directly from the "Ranking of Sustainable Revenues" of the Climate Finance Group of Latin America and the Caribbean.

6. Mexico, Costa Rica, Bolivia, Brasil, Guatemala and Perú.



Need for the common framework for taxonomies in LAC

Considering that financing flows to address climate change have been scarce in the LAC region (6% of the global distribution) and that it has not been equitable in all countries, it is important to foster the creation of mechanisms that promote a reliable market that allows capital flows to move towards sustainable investments, increasing climate finance across the region. Taxonomies can help establish clear, science-based definitions and remove barriers for such capital flows.

Taxonomy, in the context of sustainable finance, is a classification system identifying activities, assets, and/or project categories that deliver on key climate, green, social, or sustainable objectives with reference to identified thresholds and/or targets (ICMA 2020).

Taxonomies are science-based documents that provide clear guidance to all the market participants to identify projects, assets and activities that are low-carbon or compatible with low-carbon economic development and/or environmentally sustainable and help avoid greenwashing. A taxonomy seeks to strike a balance between standardisation (international environmental sustainability standards, this includes ESG criteria) but also incorporates local context and developments. Taxonomies can also serve as a tool for transition and help direct investments, especially for the transition of high emission and hard-to-abate sectors (e.g., cement and steel manufacturing). Having clear science-based definitions that are comparable⁷ with other taxonomies will help increase preferential capital flows towards sustainable investments. Taxonomies can help align investments with the countries' environmental priorities and sustainable development plans and also to redirect earmarked budget from the public sector towards more sustainable activities that would otherwise not have been implemented. They can also serve as guiding documents for disclosure and labelling of financial products. Taxonomies can be used by market participants for asset, portfolio, and entity-level alignment approaches (e.g., transition plans), among others.

7. The interoperability of taxonomies implies ensuring comparability with other taxonomies by using similar taxonomy elements such as objectives, classification systems (e.g., industrial codes) to define sectors and activities, transparent, and science-based screening criteria using metrics and thresholds with similar approaches. The key taxonomy elements are explained further in this report.

Taxonomies are being developed globally at a rapid pace and a lack of comparability could create hurdles for trade and international capital flows towards low-carbon projects and cause greenwashing in the market. Some of the main challenges with non-interoperable frameworks can lead to:

- Hurdles for flow of international capital
- Difficulties with comparison of benchmarks and ambition
- Complexities for assessment of assets, activities, and projects internationally

This report identifies guiding principles and elaborates the key structural elements (objectives, classification systems for identifying sectors and activities and eligibility criteria through metrics and thresholds) to ensure comparability and interoperability of taxonomies.

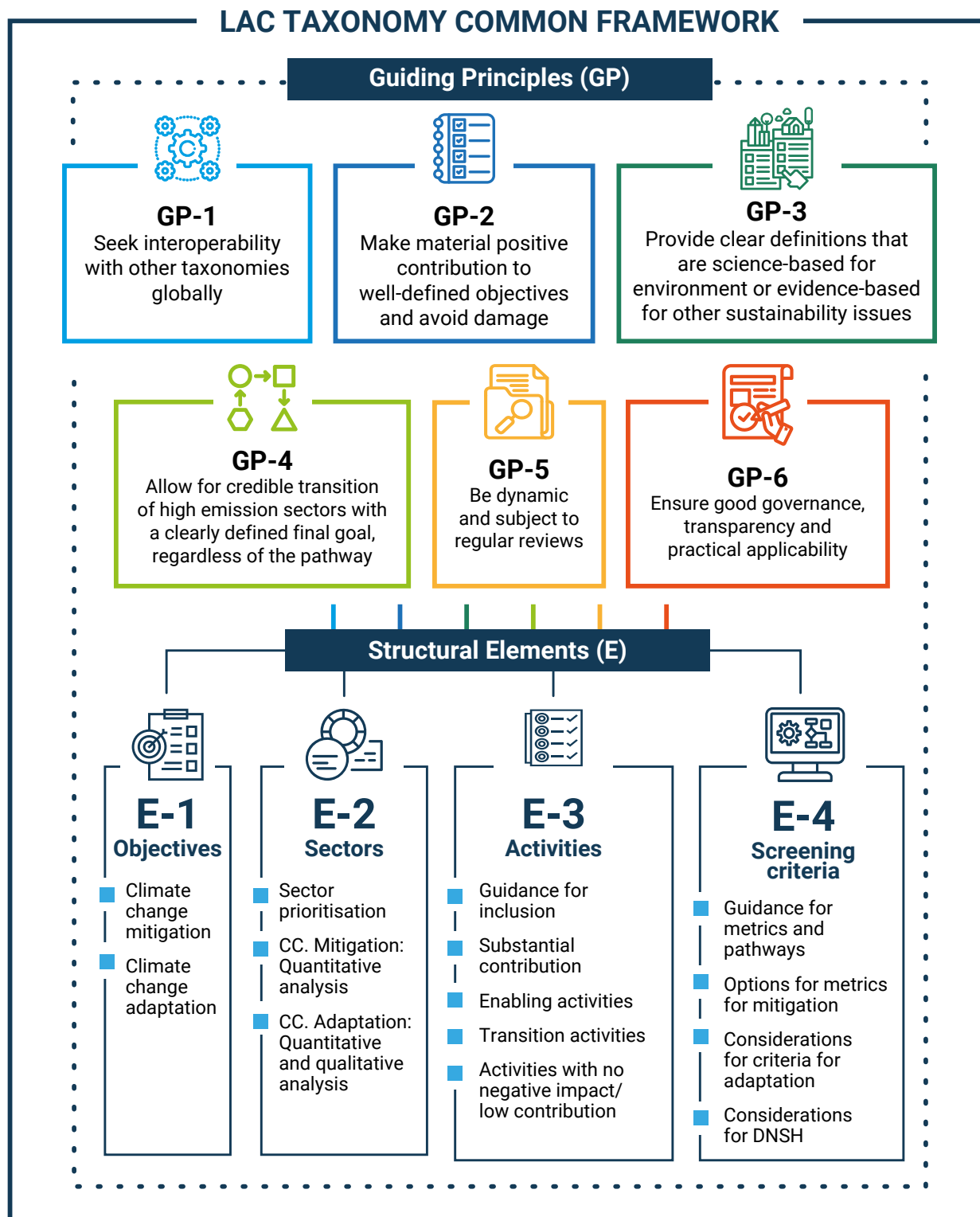
While it is important to ensure that taxonomies are adapted to suit the local context and reality, it is necessary to ensure harmonisation of structure and framework with other taxonomies globally so that they are aligned in principle and use similar methodologies to achieve the objectives⁸. Taxonomies that are interoperable also reduces barriers for international investors and capital flows.

A common framework for LAC will help ensure regional and global harmonisation while allowing for local contextualisation. It also aims to provide guidance on objectives, sectors, activities, metrics, and methodologies developing screening criteria for key sectors.

Taxonomies can have multiple environmental and social objectives and can be developed in a phased manner. Considering the importance of climate change mitigation and adaptation to the region and to ensure interoperability with other taxonomies globally that have mostly focused on these objectives in their initial phase of development, climate change mitigation and climate change adaptation were considered for the first phase of the LAC Taxonomy Common Framework. Other objectives are equally important to be addressed, especially in LAC, where objectives such as conservation of ecosystems and biodiversity have high priority. The guidance for other environmental and social objectives shall be developed in the upcoming phases of the LAC Taxonomy Common Framework.

The following image describes the components of the LAC Taxonomy Common Framework covered in this report:

8. The IMF, the World Bank Group, the OECD, and the BIS staff have worked on a technical report on emerging lessons and considerations for applying the G20 Principles on Alignment Approaches (forthcoming). This project is embedded in the G20's objective to develop a transition finance framework, built on a robust climate information architecture. The report aims at identifying fundamental connections between alignment methodologies at asset, entity, and portfolio level, that are ultimately unified by the overarching goal of achieving the same real-world decarbonization outcomes. More specifically, it provides concrete advice, suggestions, and direction on applying the G20 SFWG principles (substantial contribution, do no significant harm, transition, connection with data and disclosures, etc.) by focusing on asset- and entity-level approaches (e.g., transition taxonomies and related sectoral pathways, transition plans), and their connection to portfolio-level methodologies. It also aims at addressing the need for greater identification of transitional assets and investments in line with global mitigation objectives, due to increasing financing needs and challenging specificities of regions and countries, especially in emerging markets and developing economies. It aims at supporting relevant public authorities and private organizations in developing those alignment methodologies, in order to reach greater interoperability and avoid fragmentation in capital markets.

Figure 2: Scope and structure of the report⁹

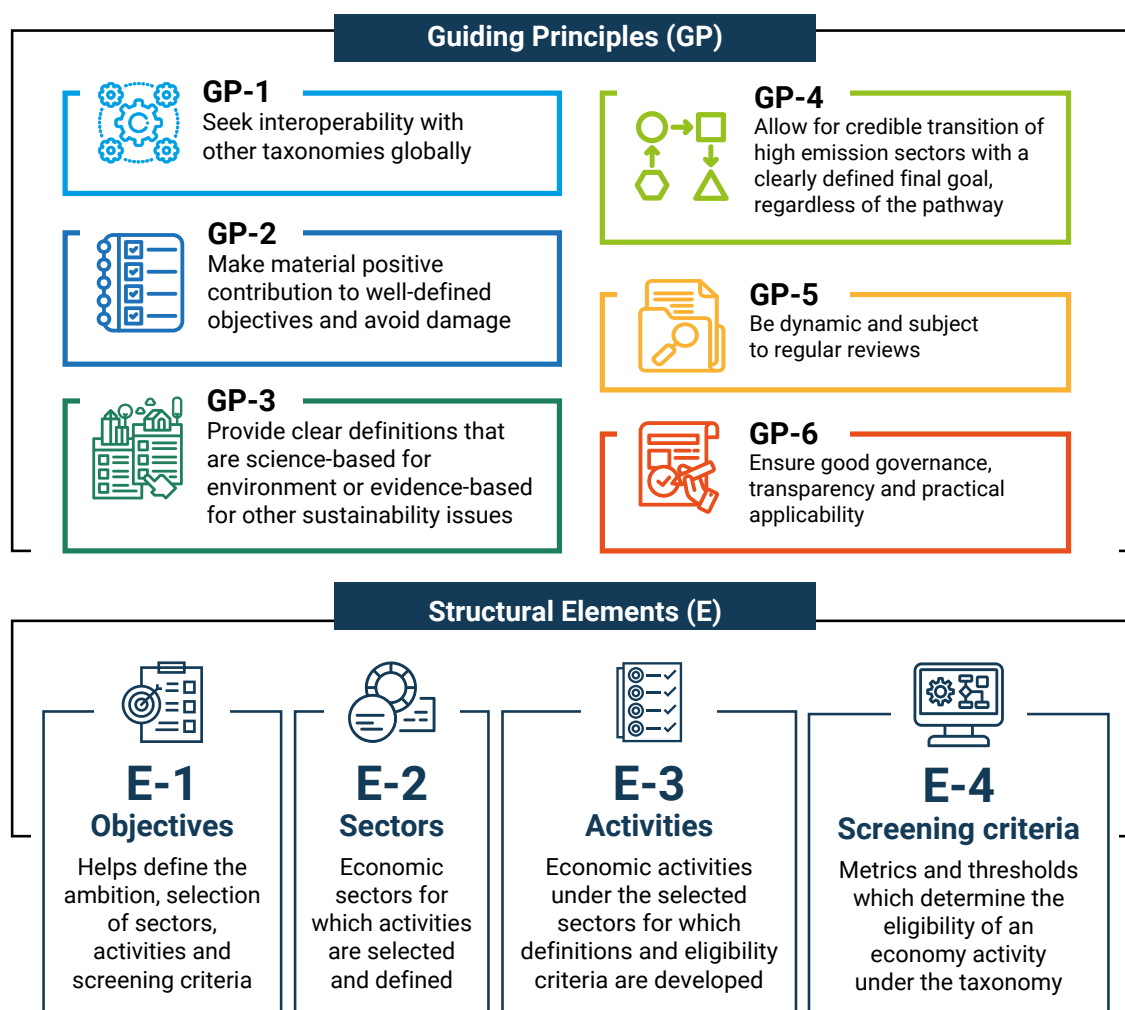
9. GP: Guiding Principle; E: Element (refers to the design elements of a taxonomy)

2. Common framework

This chapter provides guidance for national and regional taxonomies in the LAC region to develop sustainable finance¹⁰ taxonomies, with a focus on climate objectives. Other environmental and social objectives are expected to be developed in future.

The LAC Taxonomy Common Framework focuses on providing guidance for the key structural elements and the Guiding Principles that influence them. A summary of the Guiding Principles and the Structural Elements covered in this report are shown below and explained further in the report:

Figure 3: Guiding Principles and key elements



10. A Green Taxonomy focuses on climate and environmental objectives; a Sustainable Taxonomy includes objectives beyond green and covers social objectives as well. The LAC Taxonomy Common Framework provides guidance for Sustainable Finance Taxonomies, although in the current version, only objectives of climate change mitigation and climate change adaptation are developed in detail. The guidance for other objectives are expected to be developed in future.

2.1 Guiding Principles

Development of a sustainable finance taxonomy requires careful planning since it is a tool with strategic and technical dimensions. While it is necessary to ensure contextualisation of taxonomies to suit the local needs for climate finance, it is also important to ensure that they are interoperable and are harmonised with other taxonomies¹¹. Guiding principles are the rules which can guide the process of developing a sustainable finance taxonomy of economic activities. They also help ensure that the future developments and revisions of taxonomies are in-line with the LAC Taxonomy Common Framework established.

Based on the review of taxonomy developments globally and the necessities of the region, the LAC Taxonomy Common Framework establishes the following guiding principles for taxonomies:



Guiding Principle 1 Seek interoperability with other taxonomies globally

While taxonomies must ensure contextualisation to consider national goals and commitments, it is also necessary to ensure that they are comparable and interoperable with other taxonomies. This is also an overarching principle for taxonomies and the other guiding principles listed below aim to ensure the same. Comparability and interoperability imply that taxonomies must be based on similar guiding principles, have similar design and structural elements such as objectives, classification systems for sectors and activities that are comparable and are similar in approaches and methodologies used for defining eligibility¹².

This can help increase trade and the flow of international and preferential capital because consistency between definitions is guaranteed. Having a similar structure to other international reference taxonomies also helps in its interoperability.

11. The G20 Sustainable Finance Roadmap encourages jurisdictions that intend to develop their own alignment approaches to refer to a set of voluntary principles:

Principle 1: Ensure material positive contributions to sustainability goals and focus on outcomes.

Principle 2: Avoid negative contribution to other sustainability goals (e.g., though do no significant harm to any sustainability goal requirements).

Principle 3: Be dynamic in adjustments reflecting changes in policies, technologies, and state of the transition.

Principle 4: Reflect good governance and transparency.

Principle 5: Be science-based for environmental goals and science- or evidence-based for other sustainability issues; and

Principle 6: Address transition considerations.

12. The IMF, the World Bank Group, the OECD, and the BIS staff have worked on a technical report on emerging lessons and considerations for applying the G20 Principles on Alignment Approaches ((forthcoming), which aims to define interoperability principles in detail.

The interoperability of taxonomies brings clarity and transparency between approaches and ultimately reduces the cross-border cost of environmentally sustainable investments. It also provides a solid foundation to compare taxonomies, promote the decarbonisation of the region's economy and avoids market fragmentation¹³.



Guiding Principle 2

Make material positive contribution to well-defined objectives and avoid damage

Taxonomies must have clear objectives and ambition and should lead to a material positive contribution of assets and activities to the chosen objectives while ensuring no harm to other objectives (e.g., through Do No Significant Harm requirements). The chosen objectives will act as reference for the selection and prioritisation of sectors and economic activities and for establishing the screening criteria using thresholds and metrics. The construction of these objectives should also respond to the national ambitions, strategies, areas of importance and international commitments.

Although climate change objectives have been used as the main filter in the initial phase in most of the taxonomies that are under development (e.g., Singapore, Central American Regional Taxonomy, Dominican Republic) or that are operating (e.g., CBI, Colombia, EU, South Africa, South Korea) to select activities and define eligibility criteria, other environmental objectives (e.g., protection of water resources, circular economy, pollution prevention and control, protection of healthy ecosystems and biodiversity protection, environmental and land management) have been mainly addressed using the “Do No Significant Harm” (DNSH) criteria with the aim of ensuring no negative effects to other environmental objectives. In the initial phases, taxonomies have addressed social objectives mainly through minimum safeguards (e.g., IFC Performance Principles, Declaration of the International Labour Organization on fundamental principles and rights at work, etc.), but some taxonomies are also developing substantial contribution requirements for social objectives (e.g., Mexico, India) in greater detail. The Mexican taxonomy, for example, has included gender equality as an objective.

Regardless of the objectives chosen for development of taxonomies, it is necessary to ensure that the taxonomies have well-defined objectives which are addressed through definitions that ensure activities materially contribute positively, avoid harm or negative contributions to the objectives and include minimum social safeguards.

13. The International Platform on Sustainable Finance (IPSF) was launched in October 2019 with the aim of opening a channel of dialogue and exchange between international policymakers in the field of sustainable finance. In 2021, the IPSF released its first Common Ground Taxonomy Report which is the result of a high-level comparison of the EU and Chinese taxonomies, covering the climate change mitigation objective and establishing a solid methodology to compare taxonomies. The ultimate objective is to improve comparability and ensuring interoperability of sustainable finance approaches, also in line with the conclusions of the G20 Sustainable Finance Working Group. With this the IPSF is contributing to the international work on ensuring interoperability of sustainable finance approaches.



Guiding Principle 3

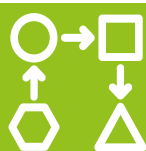
Provide clear definitions that are science-based for environment or evidence-based for other sustainability issues

One of the main objectives of taxonomies is to provide clear guidance to the market participants of both financial and non-financial sectors on defining green or environmentally sustainable investments and projects. Hence taxonomies must ensure clear, transparent, and robust definitions of sectors, activities and screening criteria which are science-based for green and evidence-based to meet sustainability objectives.

Taxonomies can be science-based by ensuring that the definitions and screening criteria for the economic activities use thresholds and metrics that are based on scientific methodologies (e.g., using decarbonisation trajectories based on carbon intensity for activities related to energy production).

Quantitative approach can be achieved by ensuring the metrics and thresholds that are quantitative wherever possible and are easily measurable (e.g., 25 gCO₂/p-km for public transport buses). For activities where quantitative definitions are not feasible (e.g., sustainable forest management), clear evidence-based qualitative definitions or references to methodologies or standards (e.g., certifications) should be established to avoid ambiguity, and ideally be subject to external verification.

Such concise definitions will help increase transparency, avoid greenwashing, and ensure a credible and science-based transition of the sectors. It will also promote comparability between investments and avoid subjectivity in defining the eligibility and green labelling processes.



Guiding Principle 4

Allow for a credible transition of high emission sectors with a clearly defined final goal, regardless of the pathway

Sustainable Finance Taxonomies must serve as a tool for credible transitions, especially for activities related to heavy industries and hard-to-abate activities that have high emissions (e.g., production of cement and basic chemicals). But for several activities, economically viable solutions to achieve decarbonisation are not yet accessible and hence might require a transition period to achieve the goal (e.g., achieving net zero GHG emissions by 2050).

Taxonomies are “dynamic” documents that constantly evolve. This is due to the rapid evolution of technologies and processes across the sectors. To achieve a credible transition, it is important to consider certain rules to ensure credible emission reductions at scale, avoid greenwashing and to ensure transparency.



Photo: CCU

The definition for transition will vary for countries depending on the current state of developments in terms of decarbonisation for the sectors and activities. For example, a country whose energy matrix is primarily fossil fuel based (e.g., Natural gas and coal based) will have a different pathway compared to a country that has a cleaner energy matrix (e.g., Hydropower-based). However, it is important to ensure that the final goal is the same regardless of the pathway and are defined by science (e.g., establishing thresholds that decline over time to achieve net zero emissions by 2050). The establishment of the final goal using benchmarks established by climate science is critical and the evolution of the transition metrics overtime to meet the final goal can be established by methods such as sector decarbonisation pathways, translating the carbon budgets into benchmarks¹⁴, among others. The role of public-private sector partnership is key to achieving credible transition across sectors. Transition is especially important for retrofit-related investments to ensure the existing investments are not stagnant (e.g., retrofit of natural gas plants to use green hydrogen). However, for new investments, the thresholds must be defined based on science-based trajectories (e.g., aligned with trajectory of 1,5°C goal of the Paris Agreement).



Guiding Principle 5 Be dynamic and subject to regular reviews

Taxonomies are dynamic documents and must be periodically revised to include more objectives, sectors, and activities due to changes in policies, technologies, and state of the transition and to revise the screening criteria for economic activities regularly to achieve the overall ambition.

As mentioned earlier, taxonomies can have multiple objectives and they can be developed simultaneously or developed in phases. Additionally, the coverage of sectors and activities can also be constantly expanded to ensure that all the relevant sectors and activities for the country or region are covered. Finally, the screening criteria for activities should include a declining trajectory, if necessary (e.g., for decarbonisation), that are aligned with science-based metrics. This implies that the definitions must be subjected to technical reviews periodically to ensure decarbonisation over a defined period to achieve the ambition of the taxonomy, without losing the objective of a just transition and decarbonising the economy.

14. The Portfolio Alignment Team report provides an initial assessment of the challenges and proposes a methodology for estimating a degree warming metric for portfolios



Guiding Principle 6

Ensure good governance, transparency, and practical applicability

The process of development and implementation of taxonomies require adequate governance for its successful application to the market. To ensure that the taxonomy is indeed usable and serves its purpose of facilitating the transformation to sustainable economies, it must strike a reasonable balance between science-based ambition and actual usability in practice (e.g., considering applicability for SMEs). Taxonomies must therefore provide guidance to market participants on its use and implementation for various users and instruments (e.g., through regulations, guidance documents, standards, certifications, and labelling, among others). The successful implementation requires continuous monitoring, development and revisions of the taxonomy and adequate legal measures, guidelines, and capacity building to ensure uptake by the market participants¹⁵.

The importance of adequate governance of taxonomies lies in the fact that the development of taxonomies requires decisions on selection of objectives, sectors, activities, and eligibility criteria, which involves coordination between multiple actors, both governmental and non-governmental. Therefore, it is necessary to organise the process under a structured hierarchy with clear roles and responsibilities assigned before the start of the process. The responsibilities and tasks of the various entities selected for the development of the taxonomy depend on the governance structure selected and must ensure a multi-stakeholder engagement (including the consultation process with public and private sectors, NGOs, civil society, multilaterals, academia, and other technical experts) to ensure a robust and a transparent development process which will also help improve the acceptance of taxonomies by market participants. Taxonomies should be shielded from political changes and/or discussions so that they maintain credibility in the markets in the face of political cycles. This can be achieved mainly through the inclusion of stakeholders other than government agencies or ministries in the development process.

Hence, this guiding principle calls for the definition and planning of adequate governance for development and implementation of taxonomies and to ensure its applicability in the market.

15. Example of an ideal governance model and development process for taxonomies are described in Annex A.

2.2 Element 1: Objectives

Sustainable finance taxonomies globally have covered multiple climate, environmental and social objectives. Most taxonomies and alignment methodologies (i.e., temperature ratings methodologies, company-level transition plan) have focussed on climate change objectives of mitigation and adaptation as a priority. This is in part due to the historical development of taxonomies focusing on achieving the goals of the Paris Agreement and decarbonisation of sectors. Climate change mitigation also has the most developed quantitative metrics. The other environmental and social objectives have initially been reflected by applying the DNSH criteria and social safeguards. The objectives help determine the ambition, selection of sectors and economic activities, and development of screening criteria to determine the eligibility of the economic activities.

The key considerations for the selection of objectives for taxonomies are:



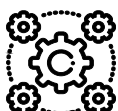
- **Ambition:** helps establish end goals that the taxonomy aims to achieve (e.g., climate change mitigation: decarbonisation of the economies to reach net zero emissions across sectors by 2050). The ambition must be defined by science, wherever possible.



- **Framework design:** provides guidance for the design and development of key elements of the taxonomy (e.g., selection of sectors and activities that contribute to the chosen objectives of the taxonomy).



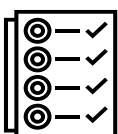
- **Establishment of screening criteria:** provides guidance for establishing science-based screening criteria for the economic activities across all sectors (e.g., metrics and thresholds for energy sector activities based on carbon intensity of GHG emissions – based on taxonomy's objective of climate change mitigation or adaptation).



- **International compliance:** the selection of objectives must consider the international commitments and ratifications by governments or regions (e.g., ecosystems and biodiversity protection commitments, social goals such as gender equality and rights-based aspects of international agreements).



- **National and regional considerations:** the objectives should consider the national and regional priorities (e.g., NDCs, regional agreements) and developments. They must be more ambitious if necessary (e.g., when the NDCs are not aligned with the global climate targets such as the Paris Agreement goals).



- **Multiple objectives:** Taxonomies can cover either single or multiple objectives depending on the priorities of the country or region. The objectives should be treated with equal importance even though it can be developed in a phased manner. Addressing multiple objectives will ensure that the definitions are holistic in nature.

The LAC Taxonomy Common Framework is expected to be expanded to include other environmental and social objectives in future. However, considering the urgency of addressing climate change to accelerate capital flows for decarbonisation of sectors and to improve adaptation and resilience of countries, and also to align with the objectives covered in most of the taxonomies globally, the LAC Taxonomy Common Framework currently focusses on the following objectives in its current phase:

- Climate change mitigation
- Climate change adaptation

Climate change mitigation

The objective of climate change mitigation focuses on the reduction of GHG emissions and help achieve decarbonisation of sectors across the economy. The main goal is to ensure the compliance with the Paris agreement goals of 1.5°C global warming limit by the end of century which requires reducing anthropogenic emissions by at least 45% compared to 2010 before 2030 and to reach zero net emissions by 2050 (IPCC 2022).

This objective can be achieved by substantial contribution of economic activities through their own performance, through transition or by enabling other activities and sectors to achieve decarbonisation. The climate change mitigation objective has been covered in all the sustainable finance taxonomies, although with different degrees of ambition and these objectives will help the LAC Taxonomy Common Framework align with taxonomies globally. Considering the importance and urgency of mitigating climate change, this objective can help increase capital flows to activities, or technologies and industrial processes which urgently need investments for decarbonisation.

Climate change adaptation

The objective of climate change adaptation refers to improving the adaptability and resilience of assets and activities across all sectors and helping the stakeholders address the current and expected adverse impacts of climate change.

Climate change has unequivocally affected all the member countries of LAC and the continuing rise of GHG emissions will cause significant damage to ecosystems, environment, and the society. The IPCC reports have indicated with a high level of confidence, that the increased frequency and severity of extreme events have resulted in increased human mortality and have caused economic loss and damage to nature (IPCC 2022). Further, the impacts of climate change have continued to exacerbate existing inequality gaps with women being the more vulnerable groups

Likewise, climate-related risks are a source of financial risk. The materialisation of different physical risks¹⁶ (damage to economic activities) and transition risks¹⁷ (caused by structural changes in economies moving towards low-carbon economic systems)

16. Physical risks are the damages that occur due to climate change events such as floods, wildfires, among others.

17. Transition risks occur due to shift or changes in policies related to low-carbon transition.

could directly affect the financial and economic system at regional and global levels (NGFS 2019) but these could be addressed through adaptation activities. Assessing activities that support climate change adaptation often requires qualitative metrics or detailed studies such as vulnerability risk assessments and are location specific. The screening criteria used for such assessments are explained in section 2.5.10.

The LAC countries have acknowledged this issue in their national strategies and international commitments (e.g., NDCs) and hence climate change adaptation is of prime importance to the region. Most of the region's NDCs have improved in the inclusion of the adaptation objective (WWF 2021) and Cuba stands out, which prioritises adaptation measures, with special emphasis on coastal zones. Mexico presents 27 lines of action in five general areas and incorporates cross-cutting elements, such as nature-based solutions, community-based adaptation, ecosystem-based adaptation, and adaptation based on disaster risk reduction. Finally, National Adaptation Plans of Action (NAPAs), or similar plans, have been or are being developed in most countries (WWF 2021).

Importance of inclusion of other environmental and social objectives

Although the scope of this report is focused on climate change objectives of adaptation and mitigation, other environmental and social objectives must be developed in the future considering their importance and impacts on the countries in LAC.

The incorporation of other environmental and social objectives will play an important role in ensuring a holistic approach for evaluation of projects, assets, and activities. It is also necessary to acknowledge that substantial contribution cannot be limited to a single objective in many cases due to co-benefits that might occur (e.g., reforestation projects can contribute to climate change mitigation as well as improvement of biodiversity, conservation of high-altitude ecosystems of Paramos would also benefit the improvement of water resources in the region).



Photos: CCU



Gender, for instance matters in climate adaptation, and it is an important determinant of vulnerability to climate change. Women are affected differently by climate change and largely underrepresented in decision making processes, limited access to finances, natural and social resources due to social norms and power relations. Gender perspectives should be integrated in adaptation initiatives into the design, implementation, monitoring and evaluation processes of adaptation policies and initiatives hence enhancing sustainability of climate projects and policies. In addition, women's unique knowledge and skills can contribute to adaptation and mitigation which should be factored into developmental and environmental management.

Taxonomies, in their initial phases have included other environmental and social objectives from a perspective that ensures that the activities do not cause significant damage to different natural resources (e.g., DNSH requirement) while ensuring the minimum social safeguards. The substantial contribution to other environmental or social objectives are being developed in some taxonomies¹⁸.

Box 1. Do No Significant Harm (DNSH)

In most of the taxonomies where mitigation of climate change or adaptation to climate change have been used as the objectives for substantial contribution, the other environmental objectives have been incorporated through DNSH requirements. These requirements can be both quantitative and qualitative (e.g., limiting pollutants for public transport buses within the national air pollution limits), and in many cases are linked to existing national regulations and standards. In the absence of local regulations, international guidelines (e.g., IFC's EHS guidelines, UNEP's Environmental and Social Sustainability framework) can be used for establishing the requirements.

The following is a summary of the scope of environmental objectives that are analysed in different taxonomies:

18. The Platform on Sustainable Finance, an independent, advisory body, whose views and opinions do not reflect the European Commission's position, published a report with a preliminary concept of a Social Taxonomy in February 2022. However, this report does not prejudice any decision or action by the Commission on the matter. Mexico is currently developing a sustainable taxonomy which include social objectives (e.g., gender equality) as a focus. The sustainable finance taxonomy of Georgia includes a social taxonomy which defines social impact indicators for the taxonomy categories.

Table 2: Scope of other environmental objectives covered in taxonomies

Objective	Scope
Conservation of ecosystems and biodiversity	The activity or asset reduces pressure on ecosystems and/or significantly improves the habitat influenced by the activity.
Water management	The activity or asset does not contaminate or cause damage to water resources and, on the contrary, promotes the efficient use of water and the protection of water sources.
Soil management	The activity or asset does not alter the physicochemical and biological integrity of the soil and, on the contrary, improves the condition of this resource.
Circular economy	The activity or asset promotes efficiency in the use of materials and resources, as well as improving the durability, reusability and/or recyclability of its components. The activity or asset tends to significantly reduce waste generation.
Pollution control and prevention	The activity or asset must not increase pollutant discharge into air, water, or soil, nor generate hazardous waste; on the contrary, it must be focused on controlling and preventing the contamination of natural resources.

There are numerous social dimensions and indicators related to human rights, equality and specifically gender equality, jobs, and employment, taxation, fair competition, just transition, among others that are important to be considered for the social objectives, however, currently the social objectives have been included in taxonomies mainly from a minimum safeguards approach (e.g., using IFC Performance Standards, the UN Guiding Principles on Business and Human Rights, OECD Guidelines for Multinational Enterprises, the ILO Core Labour Conventions). These are being developed or has been included as a substantial contribution in some taxonomies (e.g., Mexico, Georgia, Mongolia¹⁹).

19. The Taxonomy of Georgia published in 2022 has developed a social taxonomy and has established social impact indicators for the categories.

Box 2. Minimum Safeguards

Minimum Safeguard requirements ensure minimum compliance with standards and regulations for certain social objectives. They prevent the activities from violating certain minimum social aspects such as human rights abuse, corruption, etc. These requirements are often based on international standards and guidelines (e.g., IFC Performance Standards, International Bill of Human Rights, etc.) but do not supersede the national regulations. Some taxonomies (e.g., South Africa) have also specified the national legislations in addition to international guidelines for activities to comply with.

In general, the following social objectives have been mapped in the taxonomies currently:

Table 3: Scope of social objectives covered in taxonomies

Objective	Scope
Decent work and employment generation	This objective focuses on people in their working lives or as workers. The activity or project that is eligible under the taxonomy should include the four pillars of the decent work: employment creation, social protection, gender equality, rights at work and social dialogue (Platform on Sustainable Finance 2022)
Quality of life	This objective focuses on ensuring that the eligible activity, project, or asset leads to adequate living standards and wellbeing. This objective focuses on people in their role as end-users of certain products and services that either pose heightened health or safety risks or that have the potential to help people to meet basic human needs (Platform on Sustainable Finance 2022)
Inclusive and sustainable communities and societies	This objective emphasises respecting and supporting human rights by paying attention to the impacts of activities on communities and the wider society (Platform on Sustainable Finance 2022)
Sustainable cities	The focus of this objective is to ensure that the activities offer a high quality of life to the inhabitants, improve the availability, accessibility, acceptability, and quality of the different services, and reduce impacts on the natural environment, with adequate governance to maintain economic growth.
Gender equality	This objective aims to reduce the gender gap and promote inclusion all genders by designing policies, practices and interventions that are inclusive.

The selection of environmental and social objectives that are of importance to the LAC region must be done based on an assessment of the key focus areas, objectives of high importance due to damage to natural capital, national and regional priorities, and long-term strategies and policies, among others.

2.3 Element 2: Sectors

Taxonomies should cover economic sectors and activities that are responsible for GHG emissions, prone to decarbonisation or that needs to be adapted to the effects of climate change to ensure that they provide adequate guidance to the economy. The identification of sectors in some taxonomies have been carried out by evaluation of other taxonomies and frameworks (e.g., Colombian Taxonomy reviewed the sectors covered in taxonomies such as EU, CBI and compared with the national Monitoring, Reporting, and Verification (MRV) system to identify the list of sectors) or using industrial codes (e.g., international standard industrial classification (ISIC), Nomenclature of Economic Activities (NACE)) as reference to select the universe of sectors (e.g., EU, ASEAN). The industrial codes serve as a reference for a classification system which has been used commonly in financial systems. Industrial codes groups activities based on defined rules under a set of common categories and provide clear definitions. Using industrial codes helps with interoperability and to compare different taxonomies.

Majority of the industrial codes used globally are derivatives of ISIC that are often contextualised to suit the countries. ISIC has a 4-level hierarchy that is divided into Section, Division, Group and Class. The Section is the highest level of classification and are identified by alphabets. The following table shows the list of all the ISIC Sections:

Table 4: Sections covered under ISIC

A	Agriculture, forestry, and fishing ²⁰
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam and air conditioning supply
E	Water supply; sewerage, waste management and remediation activities
F	Construction
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	Transportation and storage
I	Accommodation and food service activities
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M	Professional, scientific, and technical activities
N	Administrative and support service activities
O	Public administration and defence; compulsory social security

20. Animal production and related sectors are covered in Section A of ISIC although it is not part of the ISIC category.

P	Education
Q	Human health and social work activities
R	Arts, entertainment, and recreation
S	Other service activities
T	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
U	Activities of extraterritorial organizations and bodies

(ILO 2022)

Of the 21 ISIC sectors listed above, the sectors with high incidence on climate change objectives of mitigation and adaptation based on the data from LAC were selected for further analysis and is explained further. The key sectors covered in various taxonomies are described in the Annex F.

The prioritisation of sectors was carried out using a quantitative assessment of data for the climate change mitigation objective and a quantitative and qualitative assessment for the climate change adaptation objective. The prioritisation of sectors is done at a regional level, and the results might vary for individual countries. Additionally, the results of the prioritisation must also be analysed for individual taxonomies to assess the real possibility of developing that sector, considering the availability of local regulation, national plans or programs and/or the availability of data or information, especially to define or adjust eligibility criteria that respond to the local context.

The prioritisation described below is an indicative exercise at the LAC level and not prescriptive for taxonomies in LAC.

2.3.1 Prioritisation of sectors: climate change mitigation

As mentioned earlier, taxonomies should cover sectors and activities that are relevant for decarbonisation, and they can either be developed simultaneously or in a phased manner. To develop the sectors in a phased manner, prioritisation was carried out using the parameters of contribution of the sectors to GDP and GHG emissions. This was to ensure that the sectors that contribute most to GHG emissions and the economic importance of the sectors to the regional economy are considered while prioritising. Such approach has also been used in the prioritisation of sectors in taxonomies such as The Association of Southeast Asian Nations (ASEAN), Dominican Republic, and Colombia²¹. These three methods are explained in detail in chapter 2.3.1.2 and Annex C.

The parameters were further analysed using three different analytical methodologies to ensure statistical relevance. Since the units of measurements of the selected

21. The selection of sectors under the EU Taxonomy for climate change mitigation objective was based on GHG emissions contribution of the sectors and their potential to reduce emissions. On the other hand, for climate change adaptation, all sectors were assumed to be make a substantial contribution (whole-economy approach). During the analysis in Colombia, only weighted-average method was used for analysis both GHG and economic parameters.

parameters are different (MM USD and Mt CO₂e), the methodologies selected for the analysis ensures that the data is normalised or that the units of parameters do not influence the results.

This analysis has been carried out at a regional level using secondary data, but the results might vary at the country level considering the variability of countries in LAC and hence needs to be assessed for individual taxonomies, if necessary²².

2.3.1.1 Parameters for analysis

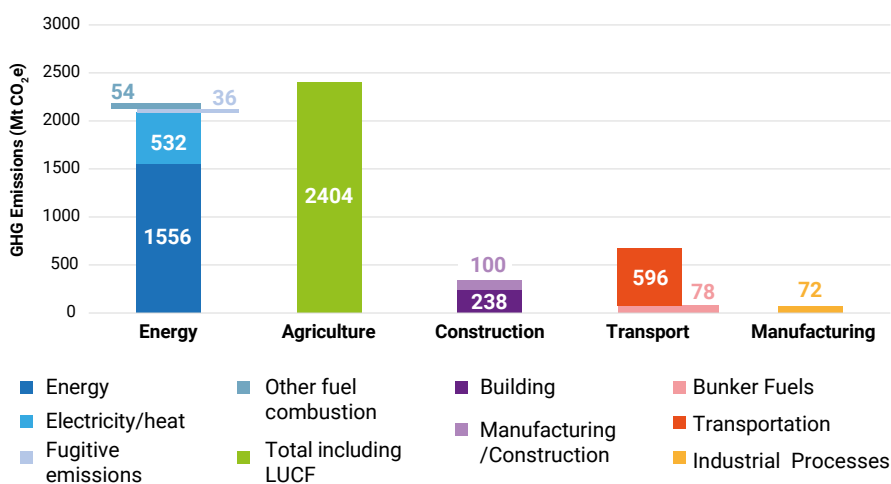
The data for analysis was compiled using different datasets for countries in LAC and the consolidated data was used for analysis as explained below:

GHG Emissions

The data source of GHG emissions was the World Resources Institute's Climate Analysis Indicators Tool (WRI CAIT). This dataset was chosen due to its comprehensiveness, accessibility, and use of reputable sources. The data for 2019 were used as they were the most recent and consistent data available for all countries pre-pandemic.

The following image shows the contribution of GHG emissions of different sectors in LAC. The data is based on cumulative regional GHG emissions for sectors, and this would vary individually for countries in LAC. About 85% of the regional emissions are from the five sectors of agriculture and land use, energy, transportation, manufacturing, and construction as shown below:

Figure 4: GHG emissions for LAC (2019)



(WRI 2022)

22. The multi-criteria methodology explained below could also be applied for prioritisation of sectors at the country level using data from primary sources such as GHG inventory, datasets of the central banks or other nodal ministries and public entities. This would result in a prioritisation that is more accurate to the local context. Other relevant environmental and social parameters that can have impact on climate change mitigation and climate change adaptation objectives such as gender equality, just transition, among others could also be potentially used for assessing the importance of sectors.

The top GHG emission contributors in 2019 were Brazil followed by Mexico, primarily due to their Agriculture and Energy sectors. The same sectoral emission contribution trend can be seen in other high GHG emission contributors of Argentina, Venezuela, Colombia, and Peru. The countries of Central America and the Caribbean Small Island states are in general the lowest GHG emission contributors. Cuba, Trinidad and Tobago, Dominican Republic and Guatemala are the highest contributors among them. The detailed emissions of LAC countries are shown in Annex B.

GDP contribution

The data of contribution of sectors to the GDP were obtained from ECLAC datasets (ECLAC 2022) and the sum for all the sectors for individual countries were collated to obtain regional data.

The methodology adopted to prepare the national accounts at current prices involved transforming the series in national currencies to current dollars for each year using the exchange rates published by the International Monetary Fund (IMF) and the final figures are expressed in United States dollars (ECLAC 2022).

The GDP data was collected for the following sectors:

1. Agriculture, livestock, hunting, forestry, and fishing: Includes the exploitation of vegetal and animal natural resources.
2. Construction: Includes general construction and specialised construction activities for buildings and civil engineering works.
3. Manufacturing, mining, and quarrying: Includes the physical or chemical transformation of materials, substances, or components into new products. Mining and quarrying include the extraction of minerals occurring naturally as solids (coal and ores), liquids (petroleum) or gases (natural gas).
4. Electricity, gas, and water supply: Includes the activity of providing electric power, natural gas, steam, hot water through a permanent infrastructure (network) of lines, mains, and pipes.
5. Waste sector includes activities related to the management (including collection, treatment, and disposal) of various forms of waste, such as solid or non-solid industrial or household waste, as well as contaminated sites, among others.
6. Transport, storage, and communications: Refers to the sub-activities of transportation and complementary and auxiliary activities and telecommunications and the provision of passenger or freight transport, whether scheduled or not, by rail, pipeline, road, water or air and associated activities such as terminal and parking facilities, cargo handling, storage, etc.

It should be noted that the data for the Water sector is included in the Electricity, gas, and water supply sector. The data of Mining sector is covered in the Manufacturing sector. Waste sector wasn't available for all countries and Venezuela did not have sector specific data for 2019.

Due to the absence of specific data for some sectors and countries, the estimates may be biased. Also, the results of prioritisation could vary for individual countries depending on the local data. This analysis is carried out at a regional level and could serve as a reference for developing of sectors at the LAC level.

Based on the constructed baseline, the data were analysed and aggregated in the 5 main sectors. The following table presents the data collected for each indicator and the respective sectors:

Table 5: Data used for analysis

ISIC Section	Sector	GHG emissions (Mt CO ₂ eq)	GDP (MM USD)
A	Agriculture, forestry, and fishing	2403,50	\$ 247.215,39
B, C	Manufacturing, Mining and quarrying	71,79	\$ 808.302,13
D	Electricity, gas, steam, and air conditioning supply	2177,52	\$ 119.520,82
F, L	Construction & Real estate activities	338,61	\$ 272.959,78
H	Transportation and storage	674,20	\$ 375.360,11

(WRI 2022), (ECLAC 2022)

The processed data used for sector prioritisation could have potential errors as the primary data for GDP used in the ECLAC dataset were sourced from statistical institutions of the member states, and the reports were not consistent for all countries (e.g., classification of sectors, coverage of all ISIC sections)²³. Additionally, since the exercise is carried out at the regional level, data for certain sectors of some countries (e.g., land-use sector emissions in Brazil) could influence the results significantly and hence the results could potentially differ for individual countries in LAC.

23. The degree of error could not be estimated or wasn't available, but the results of the prioritisation are in-line with the priority sectors in taxonomies of the region and in other taxonomies globally.

2.3.1.2 Evaluation methodologies

To prioritise and rank the sectors, three analytical methods of decision matrix, weighted average and Elimination and Choice Translating Reality (ELECTRE) were used for evaluation²⁴.

The methodologies are described in detail in Annex D and are explained briefly below:

Decision matrix

This method establishes a weight for each criterion and sums them to develop a ranking between the alternatives (Chang 2015). Each parameter is assigned a weight between 1-3 depending on the value and categorised as low, medium, and high. The aggregate GHG emissions (Mt CO₂eq) were divided from 0-300, 300-800, and >800, assigning latter the highest weight. The reason for high scores assigned to higher emissions is that the sector pollutes substantially and needs to be a priority for decarbonisation. On the other hand, GDP data (Million USD) were assigned ranges between 0-300.000, 300.000-600.000, and >600.000. The economic factor with a higher value was assigned a higher weight because it signifies a significant contribution of these sectors to the economy of the region.

Weighted-average method

The weighted average method consists of assigning a weight and scale to each criterion and then multiplying the values and totaling the final score for each alternative to create a ranking (Diéguez, et al. 2017).

This method assigns a weight to each parameter, whose total equals 1, and then multiplies this value by each data point of the matrix (Mustafa, et al. 2015). The weights for emissions and GDP were assigned 0.7, and 0.3, respectively. A higher weight was assigned to the emission parameter as the main objective of the analysis is to rank sectors based on their need for decarbonisation (climate change objective). Each of these weights were multiplied by the values for the sectors and the final ranked value was obtained. The higher the emissions and economic contribution, the more likely it is for the sector to rank higher.

24. These analytical methods have been applied in prioritisation of sectors in taxonomies such as ASEAN, Colombia, and Dominican Republic

ELECTRE

The multi-criteria decision-making method of Elimination and Choice Translating Reality (ELECTRE, for its French acronym) method allows to evaluate each criterion and alternative in order to rank them in order of preference.

This method allows the evaluation of each parameter and the alternatives and ranks them in a preferred order (Birgün and Cihan 2010). Like the weighted decision matrix, this methodology assigns weights for two parameters. The weights for emissions and GDP were 0.7, and 0.3, respectively which is consistent with the values assigned in the previous method. The initial data points for each parameter per sector are normalised to translate them into unitless values between 0 and 1. This is to ensure a valid comparison of the two parameters which have different units of measurement (GHG emissions in MtCO₂eq and GDP contributions in USD).

Subsequently, the weights were applied, and the concordance and discordance matrices were developed. Finally, matrices are evaluated using a credibility matrix to obtain a binary result of TRUE or FALSE. The more values with TRUE, the higher the count, thus higher the rank.

Results

The priority sectors that contribute to the GHG emissions and the GDP were chosen for this analysis. These sectors contribute to the principal objectives of climate change directly through their own performance. The enabling sectors such as ICT, professional services, among others help in the decarbonisation of other sectors and do not necessarily contribute to their own GHG mitigation. Also, the data for these sectors are either merged with other sectors or were not available in the datasets as explained earlier in the chapter. The enabling activities have been explained further in the report.

The following table shows the prioritisation of the economic sectors based on the objective of climate change mitigation by type of method in ascending order, with 1 being the highest priority and 6 the lowest priority. The sectors of waste and water rank lower due to non-availability of granular data.



Photo: CCU

Table 6: Sector ranking for the analytical methods

Ranking	Weighted average method	Decision matrix	ELECTRE
1	Manufacturing	Manufacturing	Agriculture, forestry, and fishing
2	Transportation and storage	Transportation and storage	Manufacturing
3	Construction & Real estate activities	Electricity, gas, steam, and air conditioning supply	Transportation and storage
4	Agriculture, forestry, and fishing	Agriculture, forestry, and fishing	Electricity, gas, steam, and air conditioning supply
5	Electricity, gas, steam, and air conditioning supply	Construction & Real estate activities	Construction & Real estate activities
6	Water supply; sewerage, waste management and remediation activities	Water supply; sewerage, waste management and remediation activities	Water supply; sewerage, waste management and remediation activities

Enabling sectors

The enabling sectors are those that improve the performance of the other sectors and activities ensure that they do not cause harm to environmental objectives (TEG 2020). The activities under these sectors might not have substantial contribution through their own performance but enable other activities and sectors to achieve decarbonization. The enabling activities have been explained further in the report. These sectors are important for the decarbonisation of the economy and hence must be included in the taxonomy. Some of the enabling sectors that should be included are:

- Mining (ISIC Section B): mining is a sector of strategic importance in LAC due to the availability of large reserves of minerals such as lithium, copper, nickel, among others, which are necessary for low-carbon transition (e.g., manufacturing of renewable energy equipment, electronic components, and batteries). The increasing demand for such minerals will also cause adverse environmental impacts and the lack of strong regulations could cause significant damage to ecosystems and natural capital (Khan and Petersen 2022). The challenge for this sector is that the international taxonomies currently have not developed criteria for activities of the mining sector and hence there are no international references for the sector development.
- Information and communication (ISIC Section J): The ICT sector helps mitigate GHG emissions in other sectors. The activities of the sector such as data-driven solutions and software for resource efficiency, meteorological solutions for adaptation and direct mitigation potential associated with activities such as data centres, etc. are essential for the overall decarbonisation of the region.
- Professional, scientific, and technical activities (ISIC Section M): The activities of this sectors are related to the implementation of efficiency measures across sectors such as technical studies and research linked to development of technologies, engineering and maintenance, and processes, among others that help in decarbonisation of the sectors.
- Carbon capture, storage, and utilisation: Activities related to the artificial capture, storage and utilisation are essential for meeting thresholds, especially for high emission sector of manufacturing. This activity is also a critical component for transition of several heavy industries and processes.
- Additionally, other activities related to Administrative Support, Financial and insurance (ISIC Section K) are important to ensure decarbonisation of the sectors or for adapting to climate change. The activities under this sector can include modelling of climate risks, financial product design, data management, increasing coverage of insurance for climate-related perils, among others.

Based on the results obtained by these analytical methods, the overall ranking of the priority sectors was derived. Additionally, other enabling sectors that have an incidence on the climate objectives are shown in the following table:

Table 7: Prioritisation of sectors – climate change mitigation²⁵

ISIC Section	Priority Sectors
C	Manufacturing
H	Transportation and storage
A	Agriculture, land-use change and forestry
D	Electricity, gas, steam, and air conditioning supply
F, L	Construction & Real estate activities
E	Water supply; sewerage, waste management and remediation activities
ISIC Section	Enabling Sectors
B	Mining and quarrying
J	Information and communication
M	Professional, scientific, and technical activities
--	Carbon capture, storage, and utilisation
K	Financial and insurance activities
N	Administrative and support services

The incidence of other service activities on mitigation might be low but could be important for climate change adaptation or for other environmental and social objectives. The sectors important for climate change adaptation are explained in the next chapter.

25. The enabling sectors are key to achieve decarbonisation. The sector of carbon capture and storage or utilisation has been covered under the Waste and remediation sectors in some taxonomies (e.g., EU and Colombia) but are being considered separately in some (e.g., ASEAN). The Mining sector has not been covered yet in taxonomies, but activities related to mining of minerals required for transition (e.g., Copper, Lithium) are highly relevant for LAC and needs to be considered. Although Carbon capture, storage and utilisation has not been classified as separately in ISIC, it should be included in the taxonomy as these technologies are necessary to help decarbonise hard-to-abate sectors and activities. This has been classified as a separate sector in some taxonomies (e.g. ASEAN) but have also been included under other sectors (e.g., Colombian Taxonomy includes these activities under the Energy sector).

2.3.2 Prioritisation of sectors: climate change adaptation

The objective of climate change adaptation has been covered transversely in some taxonomies (e.g., the South Africa Taxonomy has transversal criteria for adapted and enabling activities²⁶). The EU Taxonomy has substantial contribution criteria for climate change adaptation for activities in the taxonomy, but the criteria mostly require robust vulnerability assessments to determine such physical risks. This is because adaptation responds to physical climate risks that are mostly location and context specific. The type of risks associated with climate change may vary from one region to another. The analysis of the negative impact that climate behaviour may have on the economic sectors will depend on different variables that are specific to each sector and type of activity. The vulnerability also depends on the adaptive capacity of the sector and the economic activity (López and Velázquez 2020).

Some taxonomies have incorporated detailed adaptation and resilience criteria for few sectors (e.g., Water sector in CBI Taxonomy) and in a few, adaptation criteria have been developed and assessed through substantial contribution lens for all sectors (e.g., EU Taxonomy).

Robust climate predictions will be crucial to develop successful strategies for adaptation of the sectors to climate variability and change (European Environment Agency 2022). Policies and mechanisms related to climate change adaptation must be developed using an inclusive process where all genders, low-income and vulnerable communities are involved as often these groups are most affected by climate change due to social and economic inequalities. UNDP and the Global Environmental Facility (GEF) for example, developed Adaptation Policy Frameworks for Climate Change (APF) which is useful for identifying, prioritising, and shaping potential adaptation options into a coherent strategy. As per APF, prioritisation in terms of climate change adaptation can be across multiple dimensions of sector, region, or climate hazard, and it is to be noted that sectors are often interdependent, e.g., both human health and agriculture are dependent on water resources. Thus, sector prioritisation methodologies and options for climate change adaptation should consider relevant factors such as geographical location, GHG emissions, contributions to economy, current and future climate vulnerability, current and future socioeconomic conditions, integration across systems, among others.

In principle, priority sectors or systems can be identified where there is both high vulnerability and a high exposure of significant potential impacts from climate change, including variability. National vulnerability assessments, National Adaptation Programmes of Action (NAPAs) and Vulnerability and hazard assessment and mapping projects, can be potential sources for valuable information to assist the identification of high priority sectors, regions, and populations (UNDP-GEF 2004). :

26. The adaptation criteria that was published in the public consultation document of the Colombian Taxonomy also included similar transversal criteria for adapted and enabling activities. However, climate change adaptation criteria has not been finalised yet and is not yet part of the official taxonomy of Colombia.

- Vulnerability and adaptive capacities of LAC countries to climate change: initially, the vulnerability of LAC countries to climate change (vulnerability) was analysed, in combination with their ability to face it (readiness or adaptive capacity). To do this, information extracted from the Notre Dame-Global Adaptation Index (ND-GAIN) was assessed, by evaluating the current vulnerability of countries in LAC to climate shocks, considering 6 life-supporting areas: food, water, health, ecosystem services, human habitat, and infrastructure, and some social, economic and governance challenges to achieve resilience to climate change.
- Vulnerability of sectors in LAC countries to climate change: this section assesses and prioritises the most vulnerable sectors to climate change in the LAC region, considering the vulnerability of the countries of the region in the above-mentioned life-supporting areas as assessed by the Notre Dame Global Adaptation Index (ND-GAIN), and sectoral assessment of literature.

Vulnerability and adaptive capacities to climate change in LAC region

According to ND-GAIN Country Index²⁷, 34% of the LAC countries (11 countries) are well positioned to adapt to climate change. Among these, Chile stands out, with the lowest vulnerability score in the region and the second highest readiness score to tackle the consequences of climate change. On the other side of the spectrum, nine countries in the region (28%) have both a greater need for investment and innovation to improve readiness and a high urgency for action. Within this group, the urgency for Haiti is prominent, which has the highest vulnerability score and the second lowest readiness score in the region after Venezuela.

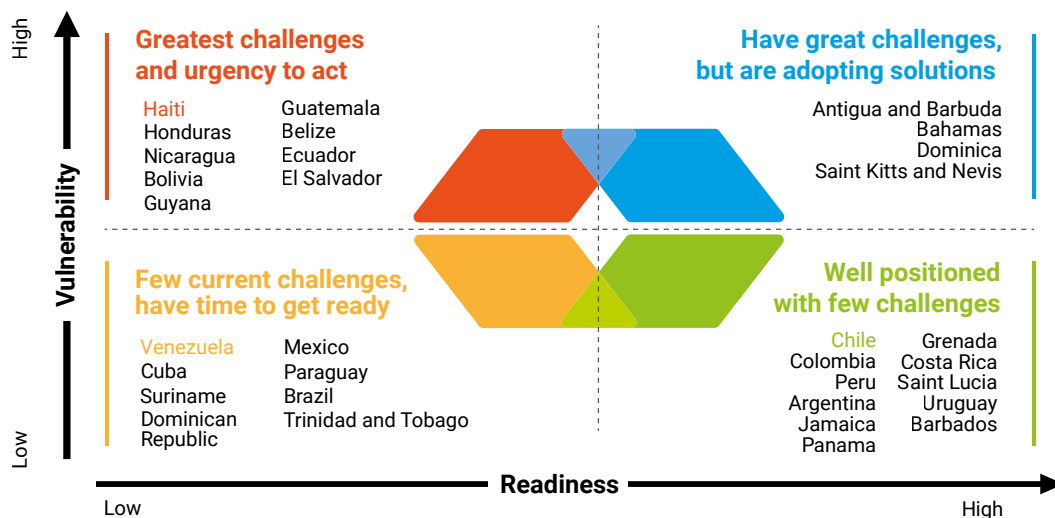
In the Central American region, Guatemala, El Salvador, Honduras, Nicaragua, and Belize have the most urgent need for action (high vulnerability and low readiness) where living conditions are being affected by the occurrence of extreme events, especially for people whose economic livelihoods depend directly on the climate (agricultural producers and fishermen) (La Ruta del Clima 2022).

On the other hand, in the LAC region 25% of the countries (8 countries) have, compared to other countries in the region, a low vulnerability score, meaning that their current vulnerabilities are manageable, but they need to improve their readiness to better adapt to future challenges of climate change. Venezuela stands out within this group, as although it has a low vulnerability score compared to other countries in the region, it has the lowest readiness score for facing the consequences of climate change. Finally, 13% of the countries in the region (4 countries) are on track to respond effectively to climate change, but given their high vulnerability, adaptation needs and the urgency to act are greater.

The following matrix shows the categorisation of LAC countries according to their level of vulnerability and their level of readiness to adapt to climate change, in accordance with the ND-GAIN Country Index. The detail data and analysis are described in Annex E.

27. The Notre Dame-Global Adaptation Index (ND-GAIN) Country Index is a free opensource index that shows a country's current vulnerability to climate disruptions, considering six life-supporting sectors: food, water, health, ecosystem services, human habitat, and infrastructure. The ND-GAIN Country Index summarizes a country's vulnerability to climate change and other global challenges in combination with its readiness to improve resilience. Index available on: <https://gain.nd.edu/>

Figure 5: Vulnerability and readiness (adaptive capacity) matrix for climate change in LAC



*Data unavailable for St Vincent and Grenadines

Based on (Chen 2015) and (ND-GAIN 2022)

Vulnerability of sectors in LAC countries to climate change

A brief qualitative assessment based on literature were carried out for the following sectors²⁸ that are particularly climate-sensitive in the region:



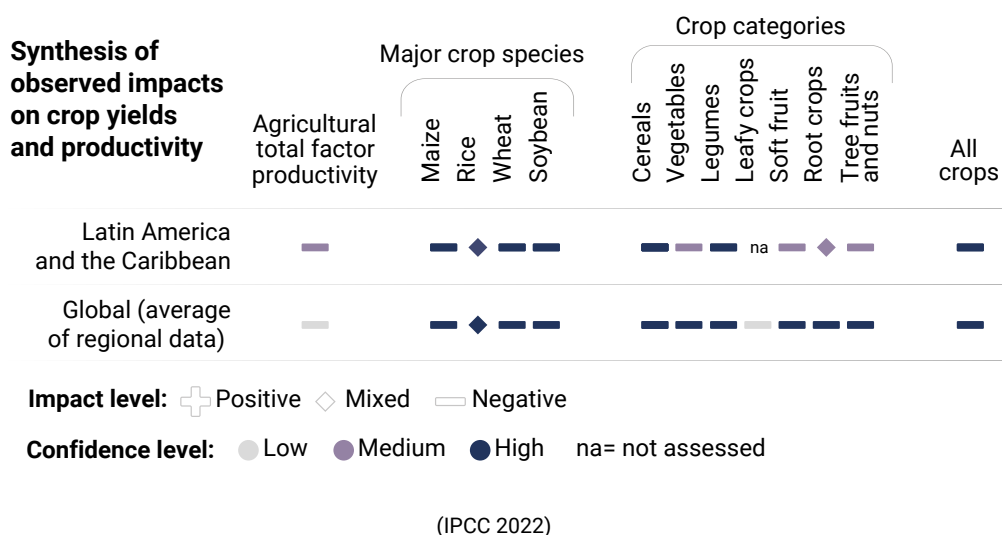
Agriculture and livestock

The agriculture sector, apart from contributing significantly to GHG emissions in the region is also extremely vulnerable to climate change. Although crop and livestock production are expected to increase in LAC in the coming decades, the region is also expected to have an increase in frequency of extreme weather events and changes in precipitation and temperature patterns that will directly influence production quality and volume, threatening the region's food security.

30 of the 32 countries analysed in the ND-GAIN Country Index identified food as a vulnerable thematic area, specifically in the components of agriculture capacity and projected change of cereal yields. The IPCC also suggests high negative impacts of climate change on crop yields and productivity across major crop species and categories based on synthesis of relevant literature (IPCC 2022). Some of the adverse impacts on crops in LAC due to climate change are shown below:

28. This analysis mainly uses the sectors defined in the NDA-GAIN Country Index. In this sense, vulnerability analysis is applied to those sectors that are crucial to human well-being and that can be greatly improved through innovation and action.

Figure 6: IPCC Synthesis of literature on observed impacts of climate change on productivity by crop type in LAC region



This adverse impact on productivity and crop yields shall mean that smallholder food producers are more vulnerable in the region than large scale producers. This point has been illustrated in the report with the example of smallholder coffee producers in southern Mexico and Central America being vulnerable due to various factors such as unstable and low coffee prices, limited institutional support, low negotiation capacity, limited access to markets, heavy reliance on one crop for income, among others (IPCC 2022).

In 2021, for example, the South American cereal harvest declined by an estimated 2.6% compared with the previous year and in the Caribbean rice crops in some areas of Cuba were adversely affected due to rainfall deficits starting in April (WMO 2022). In the same year, in Nicaragua, El Salvador and Guatemala, a total of 7.7 million people experienced acute food insecurity due to lower production, natural disasters and inflation (WMO 2022). Similarly, countries such as Brazil, Chile, Paraguay, and Uruguay were also affected due to the delay in the planting season because of below-average rainfall during the last quarter of 2021 (WMO 2022).

In livestock activities, the effects of climate change could increase the risk of infectious diseases, alter active grazing hours, affect the availability of water for livestock, among other variables that could cause a significant reduction in the sector's performance (López and Velázquez 2020).



Forestry and Ecosystem Services

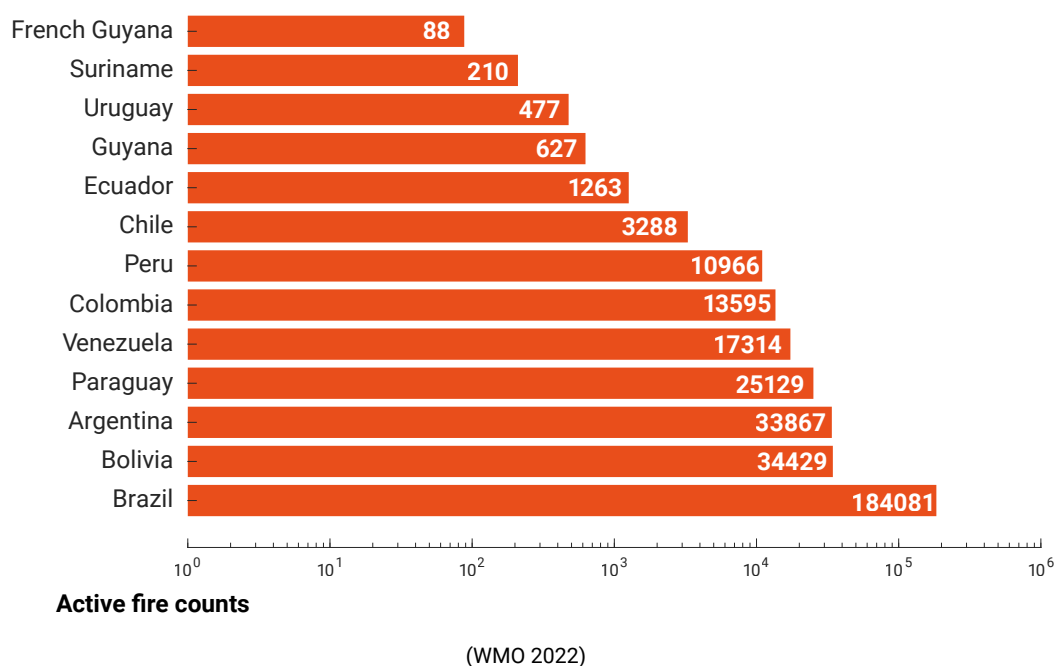
The LAC region has roughly a third of the world's forests, half of the tropical forests and a quarter of its mangroves, providing vital ecosystem services (Blackman, et al. 2014). However, LAC's forests are confronting the challenges

of deforestation, degradation, and biodiversity loss due to socio-economic pressure, and climate change. In LAC, the forest reserves are exposed to harsh conditions due to extreme weather and climate change impacts including drought, extreme rainfall, heatwaves, and glacier melts. For example, the Amazon rainforest was also exposed to unprecedented droughts and higher temperatures in 1998, 2005, 2010 and 2015-16, mainly attributed to El Niño (WMO 2022). Although El Niño events are a natural occurrence, climate models predict that there may be a possibility of permanent El Niño-like state due to a globally warmer world with dramatic effects such as droughts, fires, and increased release of carbon to the atmosphere (Wara 2005).

The rising temperatures and warming oceans have significant impact across the region. In 2020, there was warm and dry condition in South America as the rainfall shifted due to warm ocean temperatures. This resulted in warm and dry conditions in the dry forests and savannas of the south-eastern Amazon, which invariably caused increased rate of wildfires in 2020 causing irreversible damage to ecosystems (WMO 2021). Wildfires specifically are a major source of concern, and they occurred across South America in 2021. Brazil reported the highest number of fire occurrences, with around 75,000 occurring just in the Brazilian Amazon. The drought and heat wave conditions during August in the Brazilian region of Pantanal resulted in 1 million hectares getting burnt only in August, and over 1,950,000 hectares during 2021 (WMO 2022).

The following image shows the number of active fires detected in 2021 in South America displayed on a logarithmic scale:

Figure 7: Active fires in select countries in LAC in 2021



In addition to the above-mentioned key sectors (Agriculture and Livestock and Forestry and Ecosystem Services), these are some of the key aspects related to the region's vulnerability to climate change (WMO 2022):

- Some strategic marine and coastal ecosystems in the region, such as: coral reefs, estuaries, salt marshes, mangroves, sandy beaches, among others are negatively affected by climate change. For example, Mesoamerican Reef and nearby islands are low-lying and exposed to sea-level rise, and the warming of seawaters is responsible of coral bleaching.
- The impact on these ecosystems has repercussions on altering the biological cycles of the species that inhabit them, even threatening their own existence (e.g., there is already evidence in the region that coastal erosion can affect sea turtle nesting and reproduction).
- The impacts on marine or freshwater ecosystems and coastal areas can also have negative repercussions on the region's economy. Economic activities such as fishing, aquaculture and nature tourism may see their yields significantly altered due to climate change and other anthropogenic pressures. Additionally, these pressures significantly impact women, low-income and other vulnerable groups who have the least adaptive capacities to climate change and the degradation of ecosystems.



Water resources

Climate change affects water management in multiple ways due to changes in precipitation intensity, duration, and seasonal shift. The seasonal and annual patterns in floods and droughts, water availability have impacts on human health, economic activities across sectors and (fresh)water dependent ecosystems (European Environment Agency 2022). Changes in water resources will have consequences for economic sectors, particularly agriculture, forestry, energy, and fresh water supply (European Commission 2022).

About 44% of the countries assessed in the ND-GAIN Country Index have critical vulnerability scores in the water sector, specifically in dam capacity, considering that under IPCC prediction scenarios, precipitation is expected to decrease considerably across the region. The IPCC also identifies the risk of water insecurity with a high level of confidence, mainly in the regions of Central and South America (IPCC 2022). The report specifically points out the projected changes in aridity that is expected to impose freshwater stress on island states.

In LAC, glacier retreat, temperature increase and precipitation variability, together with land-use change are affecting not only the ecosystems but also increasing stress on water resources and livelihoods (WMO 2022). For example, several Caribbean countries have dealt with severe shortage of water and in Chile, the continuing drought and loss of surface and underground water resources has affected rural communities in the country (WMO 2022). According to the IPCC, there is high confidence that the South and North American regions will become drier due to the decreased precipitation patterns and increase of evaporative demand (IPCC 2022). On the other hand, it will be important for this sector to make

water and wastewater infrastructure supply networks more resilient to extreme weather by protecting aquifers, catchments, and ecosystems. While the adaptation of these systems incurs large upfront costs, the benefits will be assured slowly over time (European Environment Agency 2022).



Energy

Hydroelectric power is the most widely used renewable energy source in the world, and in LAC it supplies approximately 50% of the electricity demand (IDB 2020). Hence, changes in precipitation patterns leading to droughts in the region could significantly affect the supply of electricity and therefore the development of different activities aimed at mitigating the generation of GHG emissions.

A report by the International Energy Agency (IEA) assessed climate impacts on over 86% of the hydropower installed capacity of Latin America, focusing on 13 countries with the largest hydropower installed capacity. The assessment predicts decrease in regional mean hydropower capacity factor between 8-11% from till end of century due to changing climatic conditions (IEA 2021). The increase in population and persistent droughts in the region would invariably increase the competition of water resources. The loss of forest cover due to droughts and deforestation will increase the hydropower plants' vulnerability to climate change, aggravating soil erosion and runoff, and affecting sedimentation (Annandale, Morris, and Karki 2016). In this regard, some studies such as (IDB 2016), stress out the importance of incorporating sediment management in early planning phases of dams and Run-of-River Hydropower projects in order to safeguard water supply, irrigation, and renewable electricity.

Diversifying clean electricity sources in the region will not only reduce carbon emissions, but also constitutes a resilience strategy against the possible effects of climate change on the countries' energy matrix. Energy storage will also play a crucial role in improving resilience of the energy sector. On the availability of the renewable energy resource, the patterns for solar irradiation and wind will change, with a growth trend and biomass will also play an important role in the region. Diversification is also key for distribution systems, since climate change may also affect the energy sector in terms of the damages to energy infrastructure caused by extreme events (European Environment Agency 2022). This situation is familiar to many developing countries, where infrastructure disruptions are a daily concern. Infrastructure disruption costs households and businesses in low- and middle-income countries at least \$390 billion a year (Hallegatte, Rentschler and Rozenberg 2019).

Given the rapid advance of climate change and intensification of natural disasters, the infrastructure services will be directly affected (water, sanitation, transport, energy, and telecommunication services), threatening people's quality of life as well as productivity and economic development. In this sense, a range of coordinated actions will be required to make infrastructure systems resilient: proper planning, operation, and maintenance of assets, good design, introduce resilience in the regulations and adopting measures such as generated distribution, meshed grids, and building redundancies (Hallegatte S. R. 2019). Furthermore, climate change is

changing the patterns of consumption, for example, an increase of the demand for cooling in the summers is projected due to temperature rise and therefore the generation and transmission systems infrastructure designed must adapt to such changes in demand and load.



Transport

The transportation sector is crucial to the socioeconomic development of LAC region, as mobility and accessibility are essential elements for a dignified life and the full development of individuals and societies (European Commission, European Environment Agency 2022). Increased frequencies and intensities of extreme events (e.g. floods and droughts, extreme wind, extreme sea levels and coastal flooding rising sea levels) can have significant impacts on transportation infrastructure (such as road, railway, and ship traffic connections, among others) and its reliability and safety (European Commission, European Environment Agency 2022).

The transport emissions relative to economic output are particularly higher in LAC compared to other regions except Africa, due to dominance of road freight transport. The alternative energy efficient and cost-effective transport modes of ship and rail are relevant in only few LAC countries²⁹. The road network infrastructure of the region also needs improvement as it is estimated that the average length of road network was only 22.8km per 100km². These infrastructural gaps in transport sector, both in terms of quality and quantity was due to low investments in infrastructure, which averaged only 2.2% of GDP per year from 2000 to 2015. The optimum estimate of investment for strengthening infrastructure (including maintenance and repairs) was between 3.7% to 7.4% of GDP (Sánchez 2017).

There is thus an excessive dependence on road transport across the region, which coupled with low investments in infrastructure in the region, makes the transport sector vulnerable to climate change. The transport sector should aim to increase the resilience of infrastructure to climatic factors, and make it less carbon intensive, sustainable and smarter (European Commission, European Environment Agency 2022)(European Commission 2022).



Construction and Buildings

The Construction and Buildings sector in Latin America, except in Mexico, accounted for 21% of process related CO₂ emissions and 24% of final energy use in 2018³⁰. In Mexico, the building sector accounts for 18% of the final energy use, closely

29. Some pre-feasibility studies are currently under development on Electric Freight Train and rail connections in Costa Rica, Guatemala, the Pacific Train in Central America, also a rail net - work for freight transportation is in Brazil, Mexico, Argentina, Chile. However, the share of railways in the region's cargo matrix is still very limited. Also LAC has a small share of the global shipping industry, but in Mexico and Central America this mode accounts for 48% of the subregion's trade.

30. The data excludes emissions from manufacturing building materials and products such as steel, cement, and glass.

correlating to the regional share (IEA-UNEP 2020). Furthermore, it is estimated that the largest energy source in buildings in Central and South America in 2018 was from electricity, with 40% of energy consumption. Under IEA' Sustainable Development scenario that aligns with Paris Agreement, the share of electricity as energy source in building is projected to increase to 63% (79 Mtoe) by 2040 (IEA-UNEP 2020).

The high energy consumption for the Construction and Buildings sector, with majority dependence on electricity, which is driven primarily by Hydropower in LAC, makes the sector vulnerable to climate change impacts, especially extreme weather events. Increasing temperature, heat waves and seasonal variability is bound to increase the energy demand in buildings due factors such increase in cooling and heating demand to ensure thermal comfort (Sue Wing and Romitti 2022). Also, the buildings and construction sector in LAC has no single group of large businesses having significant control, which makes it a highly local and decentralised industry. Due to this fragmentation, there is a lack of a common and driving vision from the varied actors in the buildings sector to implement climate resilience strategies in the sector. Moreover, the effects of climate change can significantly affect both the structural characteristics of buildings and the internal conditions. Sea-level rise, increased temperatures, severe storms affect the building infrastructure directly if they are not designed to withstand such extreme conditions.

The impacts of climate change also directly affect people's health and productivity; for example, the thermal discomfort generated by the inability to adequately regulate temperatures inside buildings can lead to uncomfortable work or household environments (European Environment Agency 2022). Adverse impacts on the region's economy are also expected, for example, due to heat stress, about 2.5 million jobs could be lost in LAC, which could particularly affect the agriculture and construction sectors (IDB 2020).



Manufacturing

The participation of LAC countries in global value chain has been uneven with most countries participating in global production networks as suppliers of raw materials and basic manufacturing products. The industrial manufacturing and exports in LAC have been primarily driven by specialisation in primary commodities and natural resource based manufacturing, with the proportion nearing 75% of total exports in South America. The minerals in Bolivia, Chile, and Peru; hydrocarbons in Colombia, Ecuador, and Venezuela; and agricultural products in Argentina, Paraguay and Uruguay constituted the main export categories. Brazil is a major manufacturing hub and exporter of primary goods, but its export basket is diversified. Central American and Caribbean nations have a higher share of low and mid-tech manufacturing due to close relations with the US, but they too depend on primary commodities and nature resource-based manufacturing for more than 50% of their exports (ECLAC 2020).

The industrial sector in LAC is vulnerable to climate hazards and changes in precipitation patterns as they can be disruptive to the manufacturing supply chains, especially in categories of primary commodities and natural resource-

based manufacturing. Furthermore, the measures for climate change adaptation and regulations tend to be major drivers of regulatory reforms, not just at national but also international level. There is a move towards leveraging green and sustainable business practices and technologies across the supply chain to cater to the change in consumption patterns and attitudes towards climate change. These could be disruptive market forces for the production patterns in the LAC region, where there has been generally low level of digitalisation and technological innovation within the manufacturing processes. The adoption of new technologies and promoting greener investments for circular economy can ensure diversification of the productive structure in LAC to less resource intensive sectors, and thus building economic resilience to climate change.

Other factors

The Social, economic, and environmental factors are exacerbated by climate change and extreme events (WMO 2022). The phenomenon of migration and displacement of people due to climate change has increased over the past 8 years and is expected to continue to grow, especially for the small island nations of Caribbean region. The areas of the Andes, north-eastern Brazil and the countries of northern Central America are also sensitive to climate hazards and socio-economic challenges, that drive migration and displacement.

Additionally, as per the ND-GAIN Country Index, governance issues such as control of corruption, rule of law and regulatory quality have been identified as critical points that limit the readiness of countries to adapt to climate change in a timely manner. Similarly, some social and economic issues were identified as critical in some countries in the region to achieve resilience to climate change: lack of innovation, education, social inequality and doing business.

Human health, specifically the need of medical staff was also a critical sector identified ND-GAIN Country Index, in 19 Latin America and Caribbean countries (for further details see ANNEX E) and is key area to consider for development.

Sectors with high incidence for climate change adaptation

Although some sectors are more vulnerable to climate change than others depending on the location, demographic and social differences, climate change adaptation and ensuring resilience across all sectors of the taxonomy is pivotal in driving adaptive change across the region. Considering the ND-GAIN Index as well as secondary information obtained through literature review of vulnerability of sectors against climate change in LAC, a prioritisation of sectors from the adaptation to climate change point of view is proposed³¹: Additionally, a gender lens should be used to better identify and address the gender-differentiated needs, impacts and outcomes on women and men in relation to climate change and the prioritised sectors.

31. This exercise corresponds to a first approach to the prioritisation of sectors from an adaptation point of view. Each jurisdiction wishing to develop its own taxonomy might have to do its own prioritisation exercise, based, if possible, on relevant information specific to its territory.

Table 8: Prioritisation of sectors – climate change adaptation

Ranking	Notre Dame-Global Adaptation Index	Literature review
1	Food (Projected change of cereal yield and Agriculture capacity)	Agriculture and Livestock
2	Water (Dam capacity)	Water resources and Energy
3		Transport
4	Infrastructure and human habitat (Paved road, urban concentration)	Construction
5		Manufacturing
6	Ecosystem Services (Projected change of marine biodiversity, Engagement in international environmental conventions)	Forestry and Ecosystem Services
7	Human health (medical staff)	Social factors

Consulted sources: (IPCC 2022), (WMO 2022), (López, I. and Velázquez, R. 2020), (Blackman, R. Epanchin-Niell and Siikamäki 2014), (Wara 2005), (WRI 2022), (European Commission 2022), (IDB 2020), (IEA 2021), (ECLAC 2020), (Sánchez 2017), (IEA-UNEP 2020), (La Ruta del Clima 2022)

The results of the prioritised sectors can be grouped and mapped to the following ISIC Section codes:

- Agriculture, forestry, and fishing (Section A)
- Water supply; sewerage, waste management and remediation activities (Section E)
- Transportation and storage (Section H)
- Construction & Real estate activities (Sections F, L)
- Manufacturing (Section C)
- Agriculture, Forestry and Fishing (Section A)³²
- Education (Section P)
- Human health and social work activities (Section Q)
- Professional, scientific, and technical activities (Section M)

32. An ISIC proposal is planned to create a new group 814 "Ecosystem management" for economic activities on ecosystem management, under Division 81 'Services to buildings and landscape activities'. under this new group to record activities on for "protection of soil and water", "biodiversity and landscape", "sustainable management of forest resources" and "other environmental protection activities".

2.3.3 Overall prioritisation of sectors

Based on the data analysis, revision of taxonomies globally and the assessment of sectors in LAC, the following 14 sectors have a high relevance for the climate change mitigation and adaptation objectives³³:

Table 9: High relevance sectors for climate change mitigation and adaptation

Section	Name
A	Agriculture, forestry, and fishing
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam, and air conditioning supply
E	Water supply; sewerage, waste management and remediation activities
F	Construction
H	Transportation and storage
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M	Professional, scientific, and technical activities
N	Administrative and support services
P	Education
Q	Human health and social work activities

The other sectors could have higher importance for other environmental and social objectives and will be evaluated during the development of other objectives under the LAC Taxonomy Common Framework in future.

33. The prioritisation of sectors was carried out using the economic and climate parameters of contribution of the sectors to GDP and GHG emissions, and the classification is based on ISIC codes which is in-line with the classification system used in sustainable finance taxonomies globally. An alternative classification methodology which is also compatible with the EU Taxonomy of sustainable activities is Climate Policy Relevant Sectors (CPRS) which was first published in the journal Nature Climate Change. CPRS is a classification of economic activities to assess climate transition risk, and it considers not only GHG emissions of activities but also their relevance for climate policy implementation, their role in the energy value chain, and future investment plan. The CPRS has been used by certain European financial institutions to assess financial actors' exposure to climate transition risks. The CPRS is classified into 6 categories of economic activities into which the ISIC/NACE codes are grouped and mapped: 1-fossil-fuel, 2-utility, 3-energy intensive, 4-buildings, 5-transportation, 6-agriculture. A mapping of financial investments into the variables provided in the NGFS scenarios and NACE code was done by means of the CPRS.

2.4 Element 3: Activities

Once the taxonomy sectors have been selected and prioritised, the economic activities within each sector need to be identified by applying certain selection filters. These activities should subsequently be evaluated using the technical screening criteria wherever necessary to determine if they contribute to the objectives of the taxonomy. Taxonomies, the underlying activities, and screening criteria should be reviewed regularly and updated to be in-line with the latest science and technological advances. The screening criteria has been explained in the next chapter.

Economic and non-economic activities are all the processes to obtain products, goods and/or services intended to cover needs and desires in a particular society. All economic activities have a role to play in relation to the different environmental or social objectives. However, not all processes, technologies, assets, or economic activities contribute substantially to their fulfilment.

Selecting activities to be included in the framework is essential to eliminate ambiguities of whether an activity substantially contributes or is substantially relevant to be classified as sustainable or not. To identify the universe of activities and categorise the economic activities that should be included, different approaches can be used: i) Using a classification system of activities (e.g., ISIC) as a reference to identify the universe of activities. Starting with the list of activities under each economic sector of the ISIC code, the universe of activities can then be complemented with those activities that are relevant to the taxonomy's objectives and to the country or region but are not specified in the classification system. ii) Alternately, the activities could be identified by reviewing different taxonomies and classification systems of reference and complemented with additional activities which are important to the country but not covered in other taxonomies (e.g., Colombian, Dominican Republic and Mexican Taxonomies identified activities by reviewing other taxonomies and identifying additional activities that have importance nationally). It is also possible that the industrial codes do not include all activities that are important for decarbonisation (e.g., ISIC system does not have specific code for storage of low-carbon hydrogen). Regardless of the methodology, all activities with substantial contribution to the objectives and economic relevance and which result in the fulfilment of environmental and socioeconomic goals must be considered.

The technical screening criteria must define if the economic activities substantially contribute to the objectives. The DNSH principle could be as explained earlier in the report used when taxonomies cover multiple objectives. It is essential to note that taxonomies are dynamic documents. New activities can be included as new technologies or science proves that an activity can support a low-carbon economy periodically.

A brief guidance on the inclusion or exclusion of activities under a taxonomy are explained below:

2.4.1 Guidance for inclusion

The following rules could be applied for inclusion of assets and activities under taxonomies that:

- Substantially contribute towards the taxonomy objectives
- Enable other activities under the same or other sectors to meet the taxonomy objectives
- Need to undergo transition to eventually to meet the taxonomy ambition over a defined period
- Do not have a significant contribution but have a low or minimum contribution to the taxonomy objectives and do not cause harm

These rules for inclusion are explained below:

Substantial contribution

Economic activities that make a substantial contribution based on their own performance should be included as their inherent and substantial contribution to the climate change objectives help achieve the overall ambition of the taxonomy.

For example, electricity generation activities through ocean energy technologies or solar photovoltaic technologies are economic activities with a direct substantial contribution to climate change mitigation. The screening criteria for the activities will also help determine the substantial contribution (e.g., hydropower plants with a power density greater than 5 W/m²). These activities help with decarbonisation or improving adaptability to climate change.

The definitions of substantial contribution that are established through screening criteria change over time to ensure that they are aligned with science-based thresholds (e.g., the criteria for energy sector activities that are set at 100gCO₂/kWh declines periodically in-line with the trajectory of 1,5°C global warming limit to achieve net zero by 2050). The screening criteria is explained in detail in the next chapter.

Activities contributing to the climate change adaptation objective include those solutions that substantially reduce the risk of adverse impact or substantially reduce the negative effects of current and expected future climate on that economic activity itself. Adaptation should be achieved without increasing the risk of an adverse impact on other people, nature, and goods. According



Photo: CCU

to the EU Taxonomy, an economic activity substantially contributes to adaptation if the activity meets any of the following conditions (European Commission 2021):

- Includes adaptation solutions that either substantially reduce the risk of the adverse impact of the current climate and the expected future climate on that economic activity or substantially reduce that adverse impact, without increasing the risk of an adverse impact on people, nature, or assets; or
- Provides adaptation solutions that, in addition to satisfying the conditions set out for enabling activities (explained in the next section), contribute substantially to preventing or reducing the risk of the adverse impact of the current climate and the expected future climate on people, nature or assets, without increasing the risk of an adverse impact on other people, nature or assets.



Photo: CCU

Enabling

Enabling activities are those economic activities that substantially contribute to other objectives through the provision of their products or services. These economic activities contribute substantially to one or more of the taxonomy's objectives provided that such economic activity (European Commission 2020):

- Has a substantial positive environmental impact, on the basis of life-cycle considerations (e.g., activities of the ICT sector that help with the decarbonisation of other sectors) and
- Does not lead to a lock-in of assets that undermine long-term environmental goals, considering the economic lifetime of those assets.

Enabling activities support the transition to a low-carbon economy by eliminating a gradual increase in GHG emissions through other activities. For example, an economic activity which improves the environmental performance of another activity such as manufacturing of low-carbon technologies.

Some examples of enabling activities are:

- Manufacturing activities of low-carbon technologies
- Manufacturing low-carbon information and communications technology for climate change mitigation
- Professional, scientific, and technical activities for climate change adaptation

- Most activities in the ICT sector are fundamental to the development and/or use of integrated systems, for example, the combination of software and hardware applications that minimise resource consumption.
- Construction of dikes in coastal areas to prevent flooding of urban infrastructure as an adaptation-enabling activity

Transition

Transition activities are those for which there is no technologically and economically feasible low-carbon alternative shall qualify as contributing substantially to climate change mitigation where it supports the transition to a climate-neutral economy consistent with a pathway to limit the temperature increase to 1,5°C above preindustrial levels, including by phasing out greenhouse gas emissions, in particular emissions from solid fossil fuels, and where that activity (European Commission 2020):

- Has greenhouse gas emission levels that correspond to the best performance in the sector or industry
- Does not hamper the development and deployment of low-carbon alternatives; and
- Does not lead to a lock-in of carbon-intensive assets, considering the economic lifetime of those assets.

There are two types of such activities (Platform on Sustainable Finance 2022):

- Activities with no possible technological pathways for significantly improving their performance and hence needs to be phased out (e.g., decommissioning of fossil fuel plants)
- Activities that have potential technological pathways for significantly improving their performance and but needs to be transitioned urgently to prevent negative damage (e.g., activities of high emission manufacturing processes of cement, chemicals, iron and steel)

The inclusion of transition activities must be credible and justified by data. It is important to ensure that these activities are defined using science-based thresholds, that are dynamic allowing for incorporation of changed in technologies and policies and have a clear timeline for their phaseout. The activities considered for transition should not allow for lock-in of fossil fuel assets (e.g., new energy generation plants using fossil fuels) but focussed on improving the environmental performance of existing assets and activities. Transition of activities and entities are not linear and hence entail specific implementation challenges to establish declining trajectories for thresholds. Additionally, the decarbonisation trajectories could vary for different geographies depending on the current state of development of different activities and sectors of the economy.

The G20 Sustainable Finance Working Group has developed a set of voluntary, high-level principles for jurisdictions that intend to develop to adopt approaches to identify transition activities or investment opportunities which can be considered by jurisdictions and financial institutions on a voluntary basis as explained earlier (G20 2022).

The performance thresholds of transition activities can be for example, tied to best-in class performance (with sufficient safeguards for e.g. DNSH with other objectives) or be time-bound with sunseting thresholds to allow for a gradual shift towards sustainability. As the technologies improve and the benchmarks adjusts, so will the substantial contribution threshold of the taxonomy. This helps ensure that the taxonomy remains ambitious as innovation grows. Multiple performance thresholds can be identified for an economic activity at once to allow for different decarbonisation pathways.

Some of the principles recommended to ensure credible transitions are (CBI 2020):

- Credible transition goals that are aligned with the 1,5°C limit
- Pathways and goals that are science-based
- Credible transitions should include life cycle emissions and offsets do not count
- Technological viability trumps economic competitiveness
- Credible transitions³⁴ are backed by operating metrics and actions and not just pledges

Activities with minimum performance

These are the economic activities that do not make a substantial contribution to any one of the taxonomy objectives but neither do they cause negative damage to them. The activities can have a low contribution to the objectives of the taxonomy and cannot be labelled as green or sustainable but are essential to support the decarbonisation of the economy or are part of a decarbonised economy (e.g., activities in sectors such as services, commerce, education, health). Such low-impact economic activities that provide essential services, for example, professional services, architectural and engineering services, education, advertising and publishing activities conducted in relation to the taxonomy's objectives would enable and support other activities in the taxonomy achieve substantial contribution (climate change mitigation or adaptation in this case) and hence should be considered for inclusion in the taxonomy.

34. Credible transitions are those that are just and consider the needs of everyone in society including the poorest women and men, marginalised groups and other vulnerable groups who are often left behind.



Photo: CCU

2.4.2 Non-aligned activities

Sustainable Finance Taxonomies should not consider certain activities that are against the objectives such as:

- Activities that definitely harm or cause negative contribution to any of the taxonomy objectives
- Activities that do not have a viable transition pathway to achieve the taxonomy ambition over a defined period of time (e.g., new coal plants which cannot be decarbonised to reach net zero emissions by 2050 through their own performance)
 - Activities that hinder transition of other activities (e.g., including fossil fuel-based passenger car transport when viable decarbonised mode such as electric vehicles or other low-carbon transportation systems are available)

The non-aligned activities cause significant harm to the taxonomy's objectives and hence cannot be considered. However, for existing assets and activities that are non-aligned, it is important to phase out with an appropriate transition plan or substituting with taxonomy-aligned alternatives (e.g., substituting the demand for coal-based plants using renewables).



Photo: CCU

2.5 Element-4: Screening criteria

Screening criteria are the requirements for economic activities that are based on metrics and thresholds which help determine the alignment of an economic activity under the taxonomy. Metrics are the indicators under which a threshold can be established (e.g., gCO_2/kWh is a metric for the activities under the Energy sector and $100 \text{ gCO}_2/\text{kWh}$ is the threshold). The screening criteria provides a clear science-based quantitative guidance for determining the eligibility of economic activities and help meet the objectives and ambition of the taxonomy and thus helps avoid greenwashing.

Screening criteria must ensure the following regardless of the indicators chosen (IDB, CBI 2021):

- Based on science and clear definitions
- Quantitative wherever possible
- Subject to periodic review and revisions
- Transparency regarding the underlying methodology used
- Contributes to the objective of the taxonomy

Taxonomies have included thresholds for screening criteria using different approaches such as a unique set of thresholds (e.g., EU, CBI, Colombia, South Africa), differential thresholds (e.g., ASEAN, Singapore) and principle-based criteria (e.g., Malaysia)³⁵. Most of the taxonomies globally have used the first approach and over 9 taxonomies that are currently under development in LAC are following this as well³⁶. The pros and cons of different approaches have been assessed previously for LAC³⁷ but establishing a unique set of thresholds will ensure maximum clarity and uniformity of taxonomies in the region. Differential thresholds can be important, especially for transition activities. However, there needs to be a clear guidance for ensuring credible transition when such approaches are adopted as explained before. Regardless of the approach, screening criteria should be defined using metrics and thresholds wherever possible. There are several approaches to defining substantial contribution through screening criteria such as (Canfora, et al. 2021):

35. i) Single set of requirements: Eligibility criteria are defined by choosing a main parameter (e.g. Mitigation) and using specific metrics and thresholds (for that same parameter: $\text{CO}_2\text{e}/\text{unit of product}$) that are quantitative and a single threshold or set of thresholds or requirements for the activity that are applicable to all users of the taxonomy is defined. ii) Differential thresholds: This approach includes the establishment of differential thresholds or eligibility requirements for activities. Depending on the current level of efficiencies (e.g., emissions intensity), the starting point of the thresholds could vary, but the final ambition remains the same. iii) Principle-based criteria: This approach involves the establishment of certain guiding principles to verify the eligibility of activities.

36. Colombia, Dominican Republic, Mexico, CCSBSO countries (regional taxonomy) Nicaragua, El Salvador, Honduras, Panama, Costa Rica, and Guatemala.

37. State of sustainable finance taxonomies developed globally were assessed previously by the Working Group as part this project.

- Performance in relation to a target: criteria requires activities to demonstrate a certain performance level (e.g., gCO₂/p-km for passenger cars)
- Best-in-class: criteria requires the activity to meet the defined top-class performance of the metric (e.g., efficiency levels within top 15% of the building stock)
- Relative improvement: criteria requires activities to demonstrate a defined improvement with respect to the baseline scenario (E.g., renovation of buildings resulting in at least 20% improvement of energy efficiency compared to the actual levels)
- Practice-based: criteria requires activities to demonstrate compliance with an established list of practices or compliance parameters (e.g., implementing a list of sustainable agriculture practices)
- Process-based: criteria defines a list of qualitative-processes that would result in improvement of the environmental performance of the activities (e.g., composting process - use of source-separated waste; ensure adequate mixing to avoid methane leakage, etc.)
- Nature of the activity: can be directly eligible due to their implicit substantial contribution (e.g., electricity generation from solar PV).

Box 3. The Green Bond Transparency Platform

Promoting and facilitating the use of indicators and metrics commonly used in LAC capital markets can create significant efficiencies, aligning with the “Guiding principle 6: Ensure good governance, transparency and practical applicability” and the need of generating a trusted market to allow an increase of capital flows towards sustainable investments. To such end, The Inter-American Development Bank (IDB) developed the Green Bond Transparency Platform (GBTP)³⁸ as a public database with first-hand issuer and external reviewer data, that facilitates the standardization and harmonization of green bond reporting in Latin America and the Caribbean (LAC) for evidence-based investment decisions. Its flexible and technical structure enables the interoperability between taxonomies³⁹, while providing data on the criteria for selection of activities, projects and sectors aligned to each taxonomy and to international standards, as well as relevant indicators for measuring the impact and corresponding methodologies. Furthermore, its innovative design allows replicability in other regions, new external review types and thematic bond types while preserving standardized and harmonized reporting.

The platform provides free access to all market actors to granular and verified data with the ultimate goal of promoting transparency as a key element to attract long-term and quality investments that help countries scale up green finance. A regional taxonomy can be included in the GBTP and contribute to facilitating access of LAC projects to international investors and key market actors.

38. <https://www.greenbondtransparency.com/support/about-us/>

39. <https://www.greenbondtransparency.com/support/resources/gbtp-a-novel-database-for-green-bonds.pdf>

This LAC Taxonomy Common Framework provides a guidance for different metrics that could be potentially used for key sectors while establishing the screening criteria. It does not recommend specific thresholds for economic activities, and these must be established by the sectoral and technical experts while developing taxonomies.

Taxonomies in LAC can also use the indicators and metrics that are not described below, however in such cases, it is important to ensure that the guiding principles are adhered to. Metrics and thresholds do not substitute the legal requirements established in local and national regulations. However, using metrics that are commonly used in the market or referenced in standards and regulations would ensure easy implementation of taxonomies.

The screening criteria for substantial contribution to climate change mitigation must consider scientific decarbonisation trajectories with defined timeframes for the thresholds. However, establishing unified thresholds for different sectors might be challenging due to the nature of activities, technological advancements and economic viability, challenges with measurement of carbon stocks and GHG mitigation (e.g., agriculture activities), among others. Based on the evaluation of taxonomies globally, different approaches, and options for selection of metrics for the activities under some economic sectors focussed on the objectives of climate change mitigation, considerations for DNSH and climate change adaptation considerations are described below.

2.5.1 Construction



Background

The construction and buildings sector play a key role in Latin America's economic development. Buildings accounted for 24% of total energy consumption in Central and South America in 2019 and contributed to approximately 21% of total energy related GHG emissions. In the Buildings sector, electricity use accounted for 44 % of total final energy consumption, followed by use of biomass at 25% which is mainly for cooking (with an intensive use in rural areas), oil (18 %) and natural gas (12 %) (UNEP 2021).

There is a large housing deficit across the whole region, which has been pushing the national governments and the private sector to scale up the construction of new buildings and housing units. It is expected that between 2016 and 2060, total built area will be the same as the gross built area until 2016. Besides, the urban population of LAC reached a total of 81% in 2020 and this figure is expected to reach 86% by 2050 (UN 2019).

The potential for operational CO₂ emission reductions in the construction sector depends to a large extent on the use of energy in buildings. The climate and the way in which the buildings are constructed determine the profile of energy consumption. In LAC, there are countries with tropical climates, in which the climate depends mainly on the height above sea level where the buildings are constructed (higher

the altitude, lower the temperature); in countries with a climate marked by seasons (southern countries), energy use varies between summer and winter, thus requiring heating and cooling systems, which implies a higher energy (and emissions) intensity in the residential sector, compared to countries or cities located in non-warm tropical climate. In Caribbean countries, the unit cost of electricity is usually higher than other countries in the LAC region, which means that an investment in energy efficiency will have a shorter return on investment period compared to other countries (The World Bank 2021).

Additionally, the building materials used in different countries vary significantly. Some countries have domestic material manufacturing industries, and others rely on material imports. The latter are more vulnerable to effects on the price of construction due to disruption in the supply chain or devaluation of the local currency with respect to the dollar, which means a greater impact on construction costs. In LAC, for the buildings sector, there are large differences between countries related to:

- GHG emission intensity of buildings
- Energy intensity of buildings
- Energy tariffs
- Specific regulatory frameworks related to sustainable construction
- Sustainable construction market maturity level (certifications)
- Availability of data information related to energy consumption or emissions data for buildings
- Skilled work force required for sustainable construction (e.g., HVAC specialists, energy modelling professionals, among others)



Taxonomy ambition

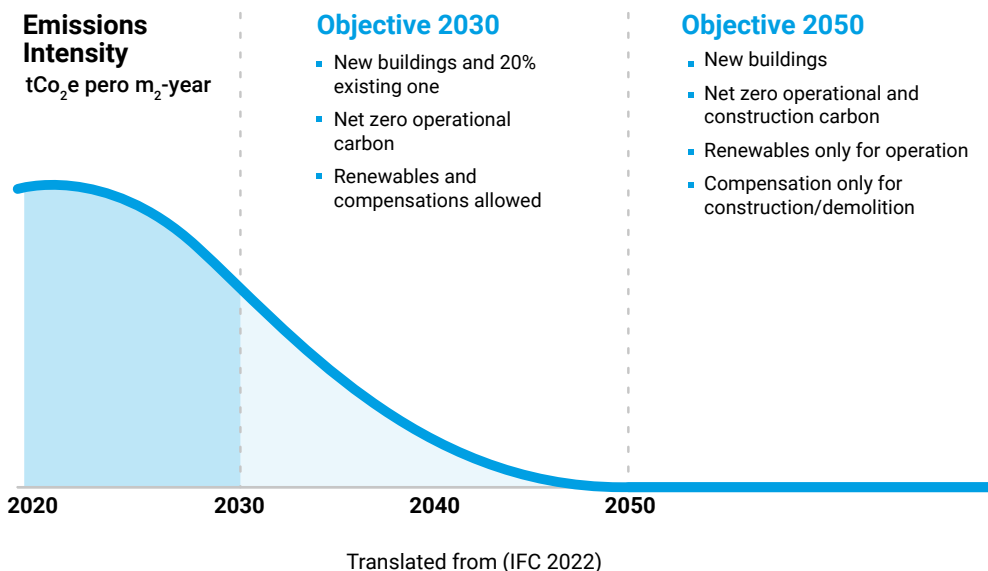
The ambition of the sector for taxonomies is to ensure net zero emissions for both building operations and construction.

The IEA, the World Council for Sustainable Construction, and other scientific bodies, have established roadmaps for the construction sector which helps align with the Paris Agreement goals. This involves ensuring that all new buildings achieve operational net zero emissions by 2030 and all building stock (new and existing buildings) achieve operational and embedded net zero emissions by 2050. The ambition for the sector is shown below:



Photo: CCU

Figure 8: Ambition of decarbonisation for Buildings



Taxonomies have focused on reducing operational emissions initially, however the embodied emissions (e.g., GHG emissions resulting from the manufacturing, transportation, and installation of building materials) needs to be incorporated to achieve the total sector decarbonisation. Hence the ambition for the sector in LAC taxonomies should cover both and could be established through screening criteria considerations in a phased manner:

Phase 1
Operational emissions (till 2030)

Emissions associated with the operation of the building, such as energy consumption in lighting, appliances, air conditioning, among others.

Phase 2
Embodied/incorporated emissions (after 2030)

Emissions during the life cycle of the project, including emissions associated with construction materials, construction processes.

The activities that are included in taxonomies under the sector cover construction and renovation of all building types, retrofit measures and professional services that are required to make the buildings efficient and the acquisition of properties.



Photos: CCU





Metrics

The substantial contribution of activities under the buildings sector focused on the climate objectives are defined using quantitative indicators and (at time) qualitative indicators (e.g., green building certifications) in taxonomies. The options that are commonly used in taxonomies for establishing metrics are described below. These options are not exclusive and can be used in combination depending on their relevance and applicability to the taxonomies:

- **Option-1**
Energy efficiency or carbon intensity reduction
- **Option-2**
Use of certifications related to sustainable construction
- **Option-3**
Based on established protocols and standards
- **Option-4**
List of requirements and checks to ensure process efficiency and to avoid emissions



Option 1: Energy efficiency or carbon intensity reduction

This approach involves establishing quantitative thresholds that are based on improving the performance of buildings. Examples of such requirements are:

- Reduction in Primary Energy Demand (PED) or energy consumption of buildings (e.g., percentage % reduction in PED)
- Meeting PED benchmarks (e.g., kWh/m²y)
- Reduction in carbon intensity of buildings (e.g., % reduction of GHG emissions)
- Meeting carbon intensity trajectories (e.g., tonCO₂e/m²y)

Information required to choose the option

- Baseline data related to emission intensities, defined by the building type and climate zones
- Baseline data related to PED or energy consumption, defined by the building type and climate zones
- Information about the efficient building stock (e.g., top stock of the buildings, defined by type of building and climate zone)
- Trajectories of decarbonisation to meet the Paris Agreement goals

Advantages

- Quantitative measurable impacts that have a clearly defined pathway for decarbonisation
- Science-based criteria
- Alignment with international frameworks and taxonomies

Disadvantages

- Depends on the quality of baseline data available in the country
- Granular data required for all building types and climate zones
- Requires established mechanisms of control and verification for the savings achieved (e.g., modeling to demonstrate PED in building design). This could increase verification costs

Examples of activities for which the option can be used: construction, renovation, retrofit and acquisition of buildings.



Option 2: Use of certifications related to sustainable construction

This option involves the use of sustainable construction certifications and labels to verify their eligibility under the taxonomy. Examples of such requirements are:

- Use of green building certifications (e.g., buildings certified by EDGE)
- Establishing minimum level of efficiencies with respect to the certifications (e.g., % of energy efficiency above the limits established in green building certifications)

Information required to choose the option

- Information about various green buildings certifications that are used locally or those that can be applied in the country
- Information about the energy efficiencies or GHG impacts of different certifications
- Comparison of efficiencies of different green building certifications
- Technical capacities installed in the country (certifiers, auditors, etc.)

Advantages

- No requirement of baseline or official data of the sector in the country
- Easy to implement
- Information related to energy efficiency, GHG mitigation impact of the certifications are easily available

Disadvantages

- Requires comparison and harmonisation of emission reductions between certification systems
- Can represent an extra cost in projects, thus limiting their applicability
- Increase in procedures and verification mechanisms for projects
- Buildings which are efficient without certifications will be excluded

Examples of activities for which the option can be used: construction, renovation, retrofit and acquisition of buildings.



Option-3: Based on established protocols and standards

This approach involves the use of a benchmark standard as a reference to establish thresholds.

Examples of such requirements are:

- Energy efficiency requirements relative to international or scientific standards (e.g., 30% reduction in energy consumption compared to the baseline established by ASHRAE 90.1)
- Reduction in energy consumption compared to the benchmarks established by the national sustainable construction regulation

Information required to choose the option

- Parametrisation of building types, construction materials and components (e.g., windows, walls) against the chosen standard for performing simulations
- Reference or guide for the market to verify buildings against such standards

Advantages

- Simple and transparent process from a technical revision point of view
- Comparable easily at a global level
- Comparable against most of the international standards when methods such as ASHRAE 90.1 is used
- Does not represent a significant additional cost for verification compared to green building certifications

Disadvantages

- Requires the definition of a reference or baseline building
- Verification and monitoring mechanism associated with calculation standards are not well established
- Can cause ambiguity in building simulation models without adequate verification mechanisms

Examples of activities for which the option can be used: construction, renovation, retrofit and acquisition of buildings.



Option-4: List of requirements and checks to ensure process efficiency

This approach is applicable for activities whose substantial contribution is implicit and might not require verification using quantitative metrics and thresholds. Examples of such activities are:

- Installation of solar water heaters in buildings
- Retrofit of buildings to install efficient façade

Information required to choose the option

- Information about the substantial contribution to climate change objectives for the activities
- List of technologies that enable substantial contribution or significant energy efficiency for buildings to meet the taxonomy criteria (e.g., smart energy management systems)

Advantages

- Easy to implement and removes need for verification in case of direct eligibility
- No data required for establishing thresholds

Disadvantages

- Does not consider process efficiencies
- Risk of implementation of low-efficiency technologies

Examples of activities for which the option can be used: individual measures and professional services such as implementation of building management systems, installation, and repair of electric charging station, among others.



Considerations for other objectives

Construction, renovation or retrofit activities have an impact on the environment which need to be considered during development of criteria for other objectives in the taxonomy. The other environmental and social objectives will be covered in detail under the LAC Taxonomy Common Framework in future, but examples of such impacts are:

- Impact on water sources due to inefficient use of water
- Impact of the activity on habitats and ecosystems (e.g., construction in coastal or biodiverse areas)
- Pollution associated with construction processes
- Pollution due to use of materials such as paints, varnishes, PVC pipes, asbestos, among others
- Waste generated during construction and demolition
- Impact on forestry due to use of wood from unsustainable sources
- Avoiding the displacement of human communities or ensure that they are moved to an adequate location



Climate change adaptation

To abate the effects of climate change, the construction sector needs to be resilient to the impacts of extreme weather and adapt accordingly. Most of the taxonomies globally have not yet incorporated activities that are specific to adaptation, but criteria for adaptation related activities have been established transversally. Examples of measures ensure adaptation and resilience of the buildings are described below:

- Buildings and interventions on an urban scale that adapt to the effects of climate change: floods, extreme temperatures, droughts
- Reinforcement and stability of buildings to withstand hurricanes and severe storms
- Improvement of drainage systems to account for high intensity rainfall
- Increased green spaces and reduced heat accumulation
- Water management, harvesting and recycling to account for water shortages
- Avoid building in areas of high probability of flooding or forest fires

The adaptation related metrics are explained further in the report.

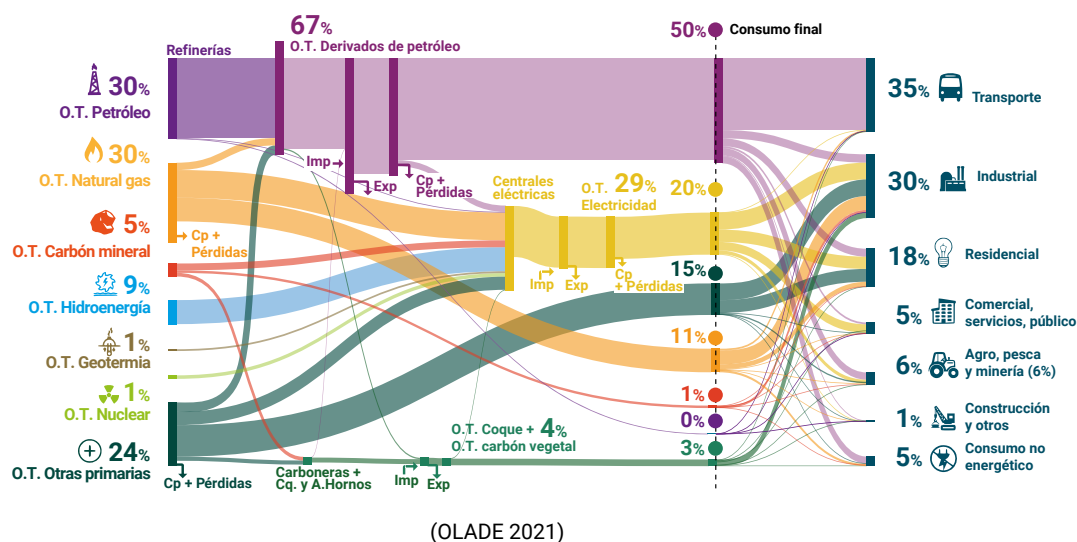
2.5.2 Energy



Background

The LAC region has a diverse energy production profile and abundant energy resources, but these are unevenly distributed among countries. Currently, the energy balance of the LAC region (2020) has a diversified energy production with an important extraction of primary energy from oil and natural gas (60%), which are mostly finally consumed in the transport (35%) and the industrial sector (30%). As of 2020, the electrification rates in LAC were 97.4% with hydropower being the primary source (46.2%) followed by non-renewable thermal energy (36.3%). Among renewable energy, wind has the highest share (6.7%) followed by solar (2.5%) (OLADE 2021). The following image shows the energy balance in LAC:

Figure 9: LAC Summary Energy Balance 2020

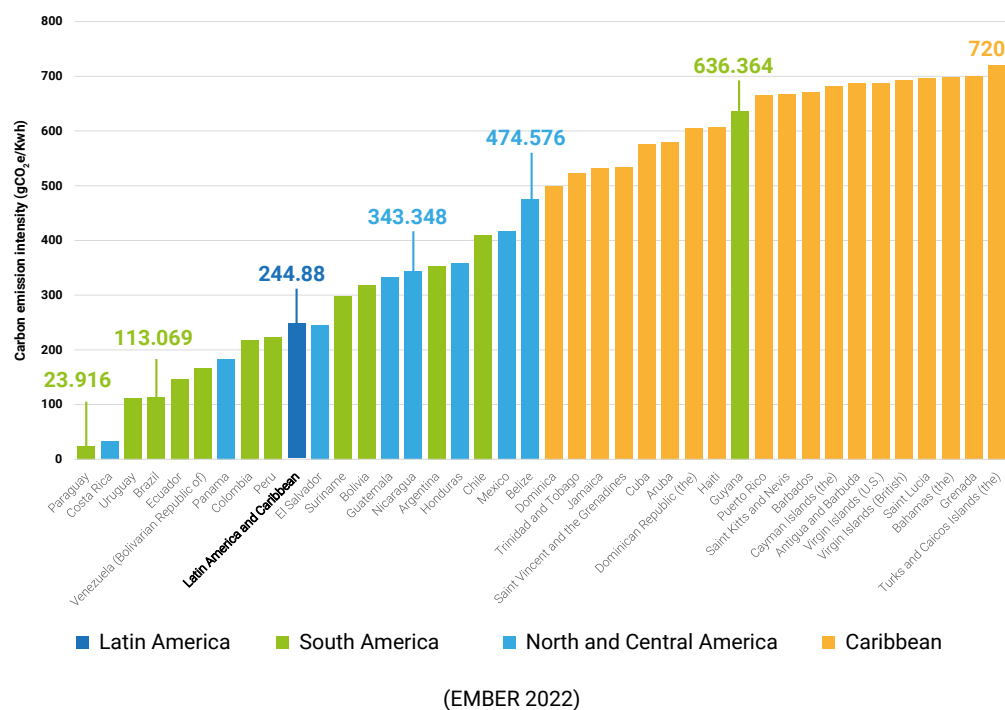


The Caribbean countries import most of their petroleum products (diesel and heavy fuel oil) for electricity generation and transportation. Despite this, the region presents the cleanest electricity generation matrix in the world due to the relatively high share of hydropower, biofuels⁴⁰ (mostly in Brazil) and, to a lower degree, the recent substitution of oil by natural gas in the electricity generation through non-renewable thermal power plants as shown in the image above.

40. Biofuels for transport includes ethanol, biodiesel, and several other liquid and gaseous fuels. Biofuels can have significant emissions in its supply chain and is important for life cycle emissions to be evaluated. They can also cause significant harm to other objectives such as ecosystems and biodiversity protection when the feedstock is sourced from unsustainable sources.

The carbon emission intensity of electricity production is a commonly used performance indicator since a decrease in its value is a desirable outcome from the environmental and climate change viewpoints. The carbon emission intensity in LAC is around 245 gCO₂eq/kWh, which is substantially lower than the global value of 436 gCO₂eq/kWh. Furthermore, the Carbon emission intensity values for the Caribbean Small Island Developing States (SIDS) is substantially higher due to lower production capacity and higher dependence on fossil fuels, compared to other countries in LAC. Guyana has the highest carbon emission intensity values among the South American countries due to its 100% dependence on fossil fuels, corresponding to electricity generation using diesel engines to drive generators (EMBER 2022). The following image shows carbon intensity of electricity production in LAC:

Figure 10: Carbon emission intensity of electricity production in 2020: LAC region



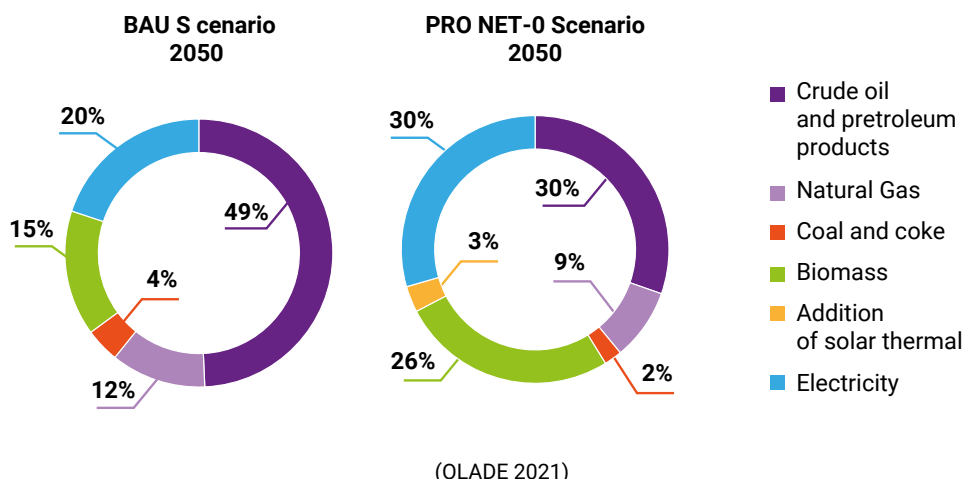
Despite the comparatively low-carbon emission intensity and high incidence of renewable energy sources in LAC, there is a possibility that reliance on fossil fuels may become entrenched if new clean electricity cannot grow at a speed considered essential for meeting the region's rising needs for electricity. Building all planned and announced fossil fuel plants in the region (most of them natural gas power plants) would make things worse, leading to emissions 150 % greater than what is consistent with 1.5°C target (Saget 2020). Also, majority of the countries in the region have already exploited the most economically viable locations for hydropower, it is important to maintain the hydropower capacity and their life span prolonged. Thus, it is pivotal that climate focussed regulatory framework are enhanced in LAC region to drive investment in new clean electricity generation.

Finally, according to Latin American Energy Organization (OLADE) (OLADE 2021), the projection of final energy consumption for the LAC region is visualised in two scenarios for 2050:

- **Business As Usual (BAU) Scenario:** LAC's total final energy consumption would have an average annual growth of 1.8%, with a significant share of oil, natural gas, and a small increase in the share of electricity by 2050.
- **PRO NET-0 Scenario:** Under this scenario, the final consumption matrix of the LAC region would show a significant increase in the share of electricity, biomass (increased use of liquid biofuels) and solar thermal energy, displacing fossil fuels, which reduce their share to 41% by 2050.

This is shown in the following figure.

Figure 11: Evolution of the final energy consumption matrix for LAC to 2050



Taxonomy ambition

The ambition of the screening criteria for the energy sector is to ensure complete decarbonisation by 2050. To achieve this, it is important to ensure that the life cycle emissions are accounted for and the feedstock or sources of energy (e.g., biomass, reservoirs) are sustainable. This ambition is achieved in taxonomies by establishing carbon intensity requirements that decrease periodically to reach net zero by 2050.

From a climate change adaptation point of view, taxonomies have addressed climate change adaptation criteria for activities in all sectors including energy production transversally and are primarily based on vulnerability risk assessments. From a mitigation point of view, taxonomies have covered activities related to energy generation from renewable sources⁴¹, storage, and distribution.

41. Some taxonomies have included fossil fuels such as energy production from natural gas as a transition activity with energy intensity-based thresholds (e.g., Singapore, EU). Under the EU Taxonomy, gas is included as a transitional activity in a limited number of circumstances and under strict conditions. The inclusion of the transitional activities of gas (and nuclear) is a small, albeit necessary part of the whole EU Taxonomy, which is focused on renewable energies. Some have argued however against the inclusion of natural gas, for example due to emissions linked to methane leakage from the production wells to distribution networks. For example, with a leakage >3%, the GHG emissions can exceed 700gCO₂/kWh.



Metrics

The substantial contribution of the energy sector to the climate objectives are defined using quantitative indicators in taxonomies to ensure their substantial contribution. The commonly used options for establishing metrics in taxonomies for activities in the sector are described below. These options are not exclusive and can be used in combination depending on their relevance and applicability to the taxonomies.

- **Option-1**
Quantitative thresholds based on carbon intensity
- **Option-2**
List of requirements and checks to ensure process efficiency and avoid emissions



Option-1: Quantitative thresholds based on carbon intensity

This approach involves establishing quantitative thresholds that are based on GHG emissions to produce energy. Some of the considerations of this approach are:

- Establishing life cycle GHG emission limit per unit of energy produced (e.g., 100g CO₂eq/kWh)
- GHG emission limits are aligned with a scientific trajectory (e.g., carbon intensity thresholds decline over time to reach net zero by 2050 based on a trajectory that complies with 1,5°C global warming limit)

Information required to choose the option

- Life cycle emission data for different technologies and projects (e.g., LCE data for biomass-based cogeneration plants)
- Reference trajectories for decarbonisation (e.g., carbon intensity reduction based on 1,5°C trajectory for decarbonisation)
- Current levels of carbon intensity for energy production in the country
- Current energy matrix in the country (e.g., to assess the need for transition of existing assets such as retrofitting natural gas plants to use green hydrogen, among others)

Advantages

- Quantitative measurable impacts that have a clearly defined pathway for decarbonisation
- Science-based criteria
- Alignment with majority of international taxonomies

Disadvantages

- Life cycle emission measurement can be complex and expensive
- Lack of data, especially for scope-3 emissions could cause challenges in estimation of LCE data
- Need for verification mechanisms or standards (e.g., ISO 14067 for measuring LCE)

Examples of activities for which the option can be used: production of renewable electricity, heat or cool and cogeneration related activities.



Option-2: List of requirements and checks to ensure process efficiency and avoid emissions

This approach is applicable for activities whose substantial contribution is implicit and might not require verification using quantitative metrics and thresholds.

Some of the considerations of this approach are:

- Establishing direct eligibility when the substantial contribution is implicit
- Ensuring checks for avoiding negative harm

Information required to choose the option

- Information about the substantial contribution to climate change objectives for the activities (e.g., storage of green hydrogen)
- Information about potential risks that can negatively contribute to climate change objectives (e.g., methane leakage in biogas plants)

Advantages

- Easy to implement and removes need for verification in case of direct eligibility
- No data required for establishing thresholds
- Substantial contribution is implicit

Disadvantages:

- Does not consider process efficiencies
- Risk of implementation of low-efficiency technologies

Examples of activities for which the option can be used: storage of electricity and thermal energy, recovery of waste heat.



Considerations for other objectives

In addition to contributing to the climate objectives, it is important that the activities do not cause harm (DNSH) to other environmental and social objectives. These objectives will be covered in detailed under the LAC Taxonomy Common Framework in future, but examples of considerations for DNSH are:

- Avoiding construction of energy production plants in sensitive ecosystems and biodiverse areas (e.g., hydropower plants)
- Avoiding damage to flora and fauna (e.g., construction of wind energy or concentrated solar plants along the migratory path of birds)
- Ensuring end-of-life recycling of components (e.g., batteries, solar panels)
- Ensuring that the hazardous waste is managed appropriately (E.g., lubricants)
- Avoiding use of unsustainable feedstock (e.g., biomass from deforested areas)
- Control of emission of pollutants (e.g., combustion of biomass)
- Prevention of altering temperature regimes in downstream water bodies (e.g., discharge of heated water)



Climate change adaptation

To abate the effects of climate change, the sector needs to be resilient to the impacts of extreme weather and adapt accordingly. Most of the taxonomies globally have not yet incorporated activities that are specific to adaptation, but adaptation criteria have been applied transversally across sectors. These metrics have been explained further in the chapter. However, examples of adaptation measures specific to the sector are described below:

- Underground cabling of Transmission and Distribution systems of electricity in areas vulnerable to storms and hurricanes
- Water management and storage for hydropower plants
- Protection against flooding for utility systems
- Ensuring availability of sustainable biomass for biomass-based energy production plants
- Adequate demand management - increased temperature and hot summers might lead to increased energy demand
- Development of adaptation and resilience policies that are inclusive of gender and vulnerable communities.

The following image gives an indication of the vulnerability of various energy production systems against climate change:

Figure 12: Vulnerability of energy production systems

Technology	Δ Air Temp	Δ Water Temp	Δ Water Availability	Δ Wind Speed	Δ Sea Level	Floods	Heat Waves	Storms
Coal	1	2	1-3	-	-	3	1	-
Oil	1	2	1-3	-	-	3	1	1
Natural gas	1	2	1-3	-	-	3	1	1
Nuclear	1	2	1-3	-	2a	3	1	-
Hydropower	-	-	1-3	-	-	3	-	1
Wind	-	-	-	1-3	3a	1	-	1-3
Photovoltaic	1	-	-	1	-	1	1	1
CSP/Solar tracking	-	-	2	2	-	1	1	2
Biomass/Biofuel	1	2	2	-	3a	3	1	-
Geothermal	-	1	-	-	-	1	-	-
Ocean	-	1	-	-	1	N/A	-	3
T&D grids	3	-	-	1	3a	1-2	1	2-3
End use	2	-	-	-	-	-	3	-

CSP = concentrating solar power, Δ = change in, T&D = transmission and distribution

^a Higher severity in coastal or low-lying areas.

Notes: 3 = severe impact, 2 = medium impact, 1 = limited impact – = no significant impact, N/A = not applicable

Source: Modified and expanded from European Commission. 2010. *Investment needs for future adaptation measures in EU nuclear power plants and other electricity generation technologies due to effects of climate change*. Final report. European Commission Directorate-General for Energy Report EUR 24769.

(ADB 2012)

2.5.3 Manufacturing

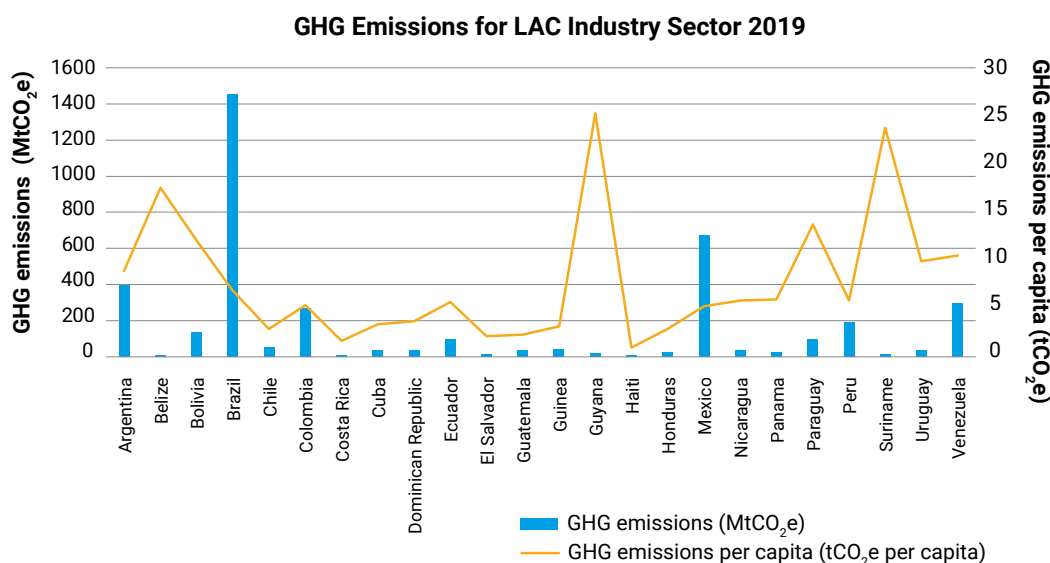


Background

The manufacturing sector in LAC region has not progressed uniformly and has also seen relative decrease in economic importance due to the abandonment of industrial policies during the 1990s and 2000s in favour of policies that led to premature deindustrialisation and the internationalisation of domestic consumption markets.

This has resulted in low integration in global value chains, and thus, LAC has just a marginal share in world export of goods, with its share not exceeding 6% since 1960s. Though the level of intra-regional trade in LAC is one of the lowest in the world, it has a higher manufacturing share than the exports to the rest of the world. According to OECD, industrialised products accounted for 73% of interregional flows and 63% of extra regional exports in 2018-19 (OECD 2021). This is because the sector is primarily involved with raw materials extraction and processing. There is further difference in Industry sector emissions among the LAC countries as shown below:

Figure 13: GHG emissions of the manufacturing sector in LAC



(WRI 2022)

The GHG emissions in LAC region for the sector is prominent in Brazil, Mexico, and Argentina, closely followed by Venezuela, Colombia, and Peru. On the other hand, the GHG emission per capita data for the industry sector points out that Brazil and Mexico have a low GHG emissions per capita value due to their large population and dependence on non-conventional energy sources. The developing economies of Venezuela, Argentina, Peru, and Colombia are in need to transition to higher share of renewable energy resources and sustainable effective production processes to reduce their effective contribution to region's GHG emissions. Most Central American and Caribbean countries in the region have low levels of industrialization. The activities under the sector have a large carbon footprint and needs to be decarbonised which will also contribute to the transition of other sectors of the economy. The sector is also extremely vulnerable to climate change which causes disruptions in availability of feedstock, water resources and supply chains.

The manufacturing activities can also have a significant impact on other environmental objectives such as circular economy, pollution and has a strong linkage to activities in other sectors (e.g., Waste and Water). For example, manufacturing of plastics or resins that are hard to recycle will add a burden on waste management systems, especially in regions where the collection and recycling infrastructure is inadequate. The unsustainable use of water for industries such as Food and Beverage, among others could cause water stress for communities located close to such industries.



Photo: CCU



Taxonomy ambition

The ambition of the sector for the climate change objectives are to:

- Transition to low-carbon industries
- Achieve net zero decarbonisation across the life cycle
- Help transition of other sectors of the economy
- Ensure resilience of the supply chains for manufacturing processes
- Transition from a linear to a circular production process while ensuring efficiency of the supply chain

Manufacturing is a high emission sector, and several industrial processes require a transition period to achieve net zero as there are currently no economically viable net zero processes or technologies available. Taxonomies can serve as a tool for decarbonisation of such activities by establishing metrics and thresholds that help decarbonise over a period of time.

Globally, taxonomies have focused on manufacturing process activities in the sector. The pathways proposed have been focussed on reducing the carbon intensity of the products considering the local context. The activities involve production of minerals and metals (e.g., cement, iron, and steel), low carbon technologies and products (e.g., electric vehicles, renewable energy equipment) and chemicals and polymers (e.g., organic, and inorganic chemicals, plastics). The activities related to manufacturing of low carbon technologies such as renewable energy equipment and clean transportation, among others enable the decarbonisation of other sectors and activities and their substantial contribution is inherent. In many taxonomies, such activities have direct eligibility with checks to prevent harm for other environmental objectives.

The intention of taxonomies for the sector is to define a pathway for different manufacturing processes to ensure increasing process efficiencies decreasing energy use and carbon emissions.



Metrics

The substantial contribution of the manufacturing sector to the climate objectives are defined using quantitative indicators in taxonomies to ensure their substantial contribution. The options for establishing metrics commonly used in taxonomies for the activities in the sector are described below. These options are not exclusive and can be used in combination depending on their relevance and applicability to the taxonomies:



Photos: CCU

- **Option-1**
Quantitative thresholds based on carbon intensity and process efficiency
- **Option-2**
Quantitative thresholds based on carbon intensity determined by carbon budgets
- **Option-3**
List of requirements and checks to ensure process efficiency



Option-1: Quantitative thresholds based on carbon intensity and process efficiency

This approach establishing quantitative thresholds that are based on GHG emissions per unit of product manufactured. Some of the considerations of this approach are:

- Establishing life cycle GHG emission limit per unit of product (e.g., thresholds based on CO₂eq/ton-cement)
- For several activities, the reduction of LCE could require implementation of additional technologies linked to artificial capture, storage, or utilisation of CO₂.
- Reducing GHG emission thresholds are aligned with a scientific trajectory (e.g., carbon intensity thresholds decline over time to reach net zero by 2050 based on a trajectory that complies with 1.5°C global warming limit)

Information required to choose the option

- Carbon intensity and LCE of key manufacturing industries
- Information about the top-stock of the industries that help determine the starting point of trajectories (e.g., carbon intensity of the top 15% most efficient cement manufacturing industries)
- Reference trajectories for decarbonisation (e.g., carbon intensity reduction based on 1,5°C trajectory for decarbonisation for steel production) and transition pathways

Advantages

- Quantitative thresholds that are easily comparable
- Easy to verify
- Easy to establish decarbonisation pathways using scientific references available globally
- Alignment with majority of taxonomies

Disadvantages

- Life cycle emission measurement can be complex and expensive
- Lack of data, especially for scope-3 emissions could cause challenges in estimation of LCE data
- Small and medium industries with low performance could face financial challenges to comply with the thresholds

Examples of activities for which the option can be used: all manufacturing activities.



Option-2: Quantitative thresholds based on carbon intensity determined by carbon budgets

This approach establishing quantitative carbon intensity thresholds that are based on capped GHG emission budget. Some of the considerations of this approach are:

- Establishing permitted GHG emissions for the activities throughout its life cycle
- Use of Emission Trading Systems (ETS) or similar standards that allow estimation of capped emissions for the sectors

Information required to choose the option

- Availability of carbon budget data (for example, Emission Trading Systems (ETS))
- Necessity of limit values for all manufacturing processes
- Monitoring and regulation of ETS

Advantages

- Control over allowed emissions for each activity type
- Quantitative carbon intensity thresholds that can be compared globally
- Easy to implement

Disadvantages

- Availability of a robust ETS system
- Data is based on historic emissions and limited to the country or region where the ETS system is applied
- Certain ETS systems do not consider scope-3 emissions or efficiencies in supply chains

Examples of activities for which the option can be used: all manufacturing processes but only if a robust ETS system is available in the country.



Option-3: List of requirements and checks to ensure process efficiency

This approach is applicable for activities whose substantial contribution is implicit and might not require verification using quantitative metrics and thresholds.

Some of the considerations of this approach are:

- Establishing direct eligibility when the substantial contribution is implicit (e.g., manufacturing of solar panels)
- Ensuring checks for avoiding negative harm

Information required to choose the option

- Identification of activities under the sector that have a substantial contribution through own performance or enable other activities and sectors that meet the taxonomy objectives
- List of technologies that have an implicit substantial contribution or those that meet the thresholds of the taxonomy (e.g., manufacturing of electric cars that are directly eligible under the transport sector in the taxonomy)

Advantages

- Easy to implement and removes need for verification in case of direct eligibility
- No data required for establishing thresholds
- Substantial contribution is implicit

Disadvantages

- Does not consider process efficiencies
- Risk of implementation of low-efficiency technologies
- Supply chain impacts and life cycle emissions are not considered

Examples of activities for which the option can be used: manufacturing of low-carbon technologies such as electric vehicles, renewable energy equipment, batteries, green hydrogen storage infrastructure, among others.



Considerations for other objectives

The activities of the manufacturing sector have impacts throughout the supply chains and hence affect several environmental and social objectives. Examples of the considerations for DNSH are:

- Procurement of feedstock from sustainable sources
- Incorporating circular economy in upstream and downstream processes
- Efficient use of water resources and sustainable water management
- Prevention of pollution to air, soil, and water bodies
- Avoiding use of toxic material in manufacturing processes
- Avoiding use of materials from sensitive ecosystems (e.g., use of deforested wood from the Amazon rainforest)
- Manufacturing products are repairable and recyclable



Climate change adaptation

To abate the effects of climate change, the manufacturing sector needs to be resilient to the impacts of extreme weather, especially for the availability of raw materials, energy, and water resources. Most of the taxonomies globally have not yet incorporated activities that are specific to adaptation, but adaptation criteria have been applied transversally across sectors and this is explained further in the report. However, examples of adaptation measures specific to the sector are described below:

- Sustainable watershed management and protection of aquifers (e.g., for water-intensive industries such as food and beverage)
- Cold-storage infrastructure for agriculture feedstock to reduce waste in supply chains and plan for low-productivity seasons
- Sustainable biomass production to ensure availability of feedstock
- Rainwater harvesting, wastewater treatment and reuse to reduce the freshwater demand
- Making industrial infrastructure resilient and protection from flooding or extreme weather events
 - On-site renewable energy production and reducing dependency on the grid

2.5.4 Agriculture, Forestry, and land use



Background

In LAC, the agriculture, forestry, and other land use (AFOLU) is one of the sectors with a high contribution to GHG emission. This is the sector with highest GHG emissions for countries such as Brazil, Colombia, Belize, Bolivia, Ecuador, El Salvador, Guyana, Haiti, Honduras, Nicaragua, Paraguay, Peru, and Suriname⁴², Colombia, Belize, Bolivia, Ecuador, El Salvador, Guyana, Haiti, Honduras, Nicaragua, Paraguay, Peru, and Suriname⁴³.

Although LAC region is home to 23.4% of the planet's forest cover and contains 50% of the world's biodiversity, there are nearly 200 million hectares of degraded land in the region and approximately 50%

42. Several LAC countries have implemented, or a developing sustainable agriculture plans and programs to reduce the impacts of this sector. For example, Brazil's ABC Plan which is the low-carbon agriculture program to incentivise farmers through low-interest loans aims to achieve rehabilitation of degraded land and improve zero tillage farming. The ACB+ program which is a continuation of this programs aims to significantly improve adoption of sustainable agricultural practices in the country.

43. Given the importance of this sector for the region, several LAC countries signed, within the framework of COP 26, different declarations reaffirming their commitment such as: i) Glasgow Leaders' Declaration on Forests and Land Use, signed by 23 LAC countries, including Brazil (the country with the second largest forest area in 2020, after Russia) ii) Global Commitment on Methane, signed by 19 LAC countries, including Colombia and Brazil.

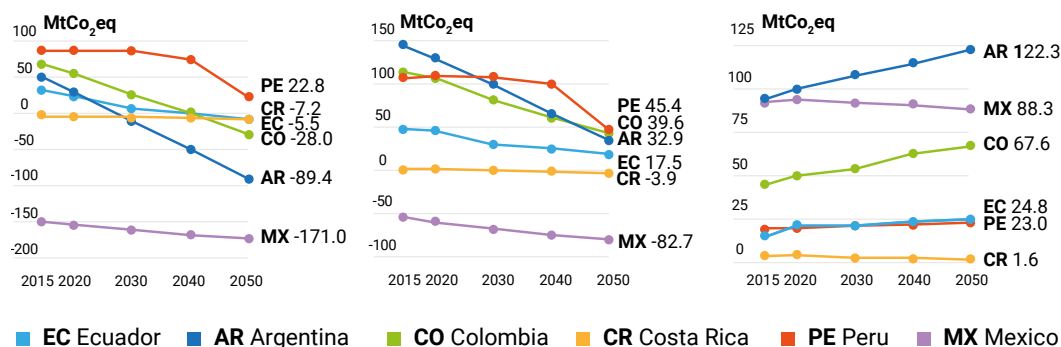
of agricultural soils are degraded due to poor management and loss of vegetation cover (FAO 2021). Likewise, deforestation is also one of the main negative drivers of GHG emissions in the region due to land use change.

The LAC region is the world's largest net exporter of food and agriculture products such as soybeans, pork, beef, poultry, maize, sugar, coffee, fruits, vegetables, among others (World Bank 2020). Despite this, the region suffers a serious problem of hunger with over 7.4% of the population affected by hunger in 2019 (AO, PAHO, WFP, UNICEF and IFAD 2021). Brazil is the largest exporter of food and agriculture products, followed by Mexico, Chile, and Ecuador. The sector is extremely diverse and heterogenous with only 18.7% of the large farms own over 76% of the land in the region (OECD and FAO 2019). The GDP of the region is expected to grow at over 1.9% in the next decade which along with increasing population to 750 million by 2030 (World Bank 2020) is expected to increase the demand for food and agriculture products, especially animal-based products. By 2028, the consumption of meat products is expected to grow by 10%, fish by 12% and poultry by approximately 15%. Biofuel production has been increasing significantly in the region, especially in countries like Brazil but is expected to drop in the next decade (OECD and FAO 2019).

According to the Deep Decarbonization Pathways (DPP) in LAC, developed by the IDB in 2020⁴⁴, absolute emissions in the AFOLU sector are expected to be below 50 MtCO₂e in 2050, tending to zero net emissions and, for some countries, such as Mexico and Costa Rica, the sector is expected to result in net negative emissions (due to the increase in annual carbon sequestration in existing forests and afforestation or reforestation). However, agricultural emissions are expected to increase, and the decarbonisation will be achieved only through land use change (for example by afforestation) and reduction of deforestation.

Hence, the decarbonisation of AFOLU sector by 2050 is a huge challenge given the growing demand for food, the increase or maintenance of agricultural exports in most LAC countries and the various sources of emissions from this sector. The following illustration shows the expected trajectories of GHG emissions for the sector in select countries:

Figure 14: Expected GHG emission trajectories for AFOLU



(IDB 2020)

44. The Deep Decarbonisation Pathways in Latin America (DDPLAC) project, conducted by the IDB in 2020, only included teams from Argentina, Colombia, Costa Rica, Ecuador, Mexico, and Peru.

Specifically for Brazil which is the largest contributor to GHG emissions in the AFOLU sector in LAC (with 818.6 Mt CO₂e in 2019), In 2009, the Brazilian government established a sectoral plan for climate change mitigation and adaptation, specifically called the Low-Carbon Agriculture Plan (LCA), which aims to reduce GHG emissions from this sector, as well as to increase the fixation of atmospheric CO₂ in the plant/soil system of the different sectors of Brazilian agriculture (Gama-Rodrigues 2022).

These strategies have promoted the reduction of approximately 215 million TCO₂eq, mainly through the adoption of practices associated with the correct management of pastures and fodder, and zero tillage practices (Gama-Rodrigues 2022) (Potenza RF 2022). However, greater effort will be needed to achieve a 60%⁴⁵ reduction in emissions from this sector by 2050, given that only a reduction of approximately 22% has been achieved so far, considering the total emissions of this sector in 2020⁴⁶ and the reductions achieved by the implementation of the sectoral plan.

In many contexts, women and girls experience the impacts of climate change as they constitute majority of the world's poor and are highly dependent on natural resources, in addition to limited access to resources, decision making processes and limited mobility (OECD 2015).

Finally, the impacts of climate change on the sector in LAC is significant on both crop yields and area harvested. This is due to both direct climate effects such as changes in temperature and rainfall patterns and changes in prices and instability due to varying demand and supply which are influenced by policies and incentives (World Bank 2020).

To ensure effective implementation of climate change adaptation in agriculture, gender integration and identification of gender sensitive strategies is critical due to the women's high participation in agriculture. Gender gaps in access to markets, information, technology, among others can cause inequalities for adapting to climate change. Programmes and policies need to respond to gendered impacts of climate change and promote gender responsive adaptation and mitigation in the agricultural sector including planning, implementation, monitoring and gender responsive budgeting for women specific activities.



Fishing

Fishing related assets and activities from a taxonomy point of view is very incipient, due to complexities related to defining the sustainability and decarbonisation parameters. Some guidelines and frameworks related to blue finance have covered activities related to sustainable fisheries and aquaculture⁴⁷ (IFC 2022). However, specific thresholds for climate objectives have not been established.

45. Specifically, the 2050 decarbonisation pathway for this sector in Brazil, a continuous decrease in GHG emissions from the AFOLU sector is expected (approximately 60% in 2050 compared to 2020 emissions), until the sector becomes a net sink in 2050.

46. Although sectoral emissions data for 2019 were used for the prioritisation of sectors in this document, some data have been updated during 2022. In this regard, emissions from the AFOLU sector in 2020 correspond to a total of 994 Mt CO₂e.

47. For example, the IFC's Blue finance guidelines considers activities related to land-based aquaculture, sustainable cultivation of algae and other microorganisms, bio-based products, biorefineries, sustainable supply chains and other activities under the sector. The guidelines also allow the use of certifications such as Marine Stewardship Council label, Aquaculture Stewardship Council certification for sustainable investments in the sector.

Fisheries and aquaculture have an important role to play in several areas such as contributing to the transition to sustainable food systems, development of bioeconomy and circular economy (using renewable aquatic resources), reversal of biodiversity loss, among others. Frameworks, and technical criteria in taxonomies are under development.

The EU for example, has developed guidelines for sustainable aquaculture. This aims to establish sustainable practices and mitigate the impacts that aquaculture activities may have on the environment (e.g., carbon footprint, effluents and waste that result in high water pollution or other impacts on marine and freshwater ecosystems), and that aquaculture activities do not significantly harm ecosystems or biodiversity. On the other hand, CBI previously aimed to develop screening criteria for aquaculture and capture fisheries in marine environment but is currently under hold. The work previously done aimed to identify possible pathways for setting eligibility requirements for the mitigation component of the criteria in respect of fishing vessels, which may also be applicable at the fishery level, however, data coverage in terms of global catch is not complete enough to be able to set globally applicable and robust thresholds. In terms of taxonomies, Georgia's Sustainable Finance Taxonomy includes the Fisheries & Aquaculture activity, and the eligibility criteria are mainly based on certifying the produce using Bio certificates issued by accredited international or national entities such as CaucasCert, EuroCert, among others.



Taxonomy ambition

The ambition of the sector should be to ensure the following:

- Achieve net zero emissions in AFOLU sector by 2050
- Reduce global anthropogenic methane emissions by at least 30% by 2030 from 2020 levels (global methane commitment)
- Increase the efficiency of crop/livestock production (e.g., efficient water management, fertilizer use)
- Increase long-term carbon sequestration from forests, to reach the goal of zero net emissions by 2050
- Increasing annual carbon sequestration in existing forests and expand forest cover
- Ensure zero deforestation
- Improve adaptation and resilience of the sector⁴⁸

The AFOLU sector in taxonomies currently have included activities related to the forestry such as forest plantation, reforestation, restoration, rehabilitation and conservation and activities related to agriculture and livestock such as perennial and non-perennial crops and livestock production.

48. Due to the importance of this sector for the region in terms of mitigation and adaptation to climate change, this sector has perhaps the greatest scope for international cooperation that extends beyond the current channels of market and finance-based multilateral development banks. It is also one of the sectors that most requires research in the region, to obtain more relevant information to achieve the decarbonization pathway.



Metrics: Forestry

The metrics for the activities of the forestry sector in taxonomies globally have mostly based on the options described below. These options are not exclusive and can be used in combination depending on their relevance and applicability to the taxonomies:

- **Option-1**
Implementation of sustainable management and best practices
- **Option-2**
Calculation of carbon stocks



Option-1: Implementation of sustainable management and best practices

This approach includes establishing a list of activities for sustainable forest management, ensuring that the activity financed complies with the best practices available. Examples of such practices are:

- Selective logging to maintain balance
- Protection of biodiverse and ecologically important forest areas
- Maintenance and improvement of biodiversity

Information necessary to choose the option

- Comprehensive information related to the best practices and their impacts on improvement environmental performance
- Regionally appropriate approaches and practices that can be verified easily or are internationally recognised

Advantages

- Easy implementation, especially when the practices are commonly used in the country or region
- Ample studies and international references available for selection of best practices under sustainable forest management

Disadvantages

- Lack of scientific accuracy in defining emission reductions or carbon sequestration and the results are not quantifiable easily
- Difficult to monitor compliance with reduction targets or decarbonisation pathways
- Results of best practices are often observed in long-term

Examples of activities for which the option can be used: forest management, afforestation or plantation forestry, restoration and rehabilitation, hybrid systems.



Option-2: Calculation of carbon stocks

This option involves calculating the carbon stocks to measure the impact achieved using quantitative metrics. Examples of such metrics are:

- GHG measurement of carbon stocks by establishing a baseline before the intervention (e.g., baseline established by estimating the number and type of species and using the growth-yield curves) and the carbon sequestration measured after a defined duration (e.g. 20 years).
- Estimation of carbon stock improvement

Information necessary to choose the option:

- Knowledge of the area, species, number of trees and growth factors
- Protocols for establishing baseline of GHG emissions
- Established methodologies for estimation and verification of carbon stock accounting

Advantages

- Scientific accuracy in determining the increase of carbon pools and their impact on the taxonomy ambition
- Transparency from the technical point of view

Disadvantages

- Challenges and complexity for measuring carbon below ground (i.e., below-ground biomass)
- Establishing a universal absolute threshold for carbon stocks is not a viable option, as the variability of carbon sequestration is highly context-dependent
- Lack of knowledge and specific data for baseline calculation
- Need for audits and verification which will increase costs

Examples of activities for which the option can be used: afforestation or plantation forestry, reforestation, and restoration.



Demonstration of performance improvement

Taxonomies have used both the options mentioned above to verify the eligibility of the activities under the sector. The demonstration of continued improvement of environmental performance can be through the successful implementation of best practices (option-1), or quantification of the impacts such as carbon sequestration (option-2). It is important to establish a time interval (e.g., 10 years) during which the impacts shall be measured.

The demonstration of performance improvement requires assessment of permanence and continued progress of the Forest Management Practices. It is required to establish an interval plan (e.g., 10 years) where the criteria defined in options 1 and/or 2, if applied, are evaluated.



Metrics: Agriculture and livestock

The metrics for the activities of the agriculture and livestock sector in taxonomies have mostly been based on the options described below. These options are not exclusive and can be used in combination depending on their relevance and applicability to the taxonomies:

- **Option-1**
Implementation of best practices
- **Option-2**
Estimation of GHG reductions
- **Option-3**
Use of certifications



Option-1: Implementation of best practices

This option involves implementation of best practises that demonstrate reductions in GHG emissions and positive contribution such as increase in carbon stocks. This option includes establishing a list of activities of low-emission agricultural and livestock practices relevant to the region. These practices should be consistently applied in the crop or livestock production area each year. To demonstrate compliance with all essential practices, it is necessary to establish protocols or methods such as a farm sustainability management plan.

Examples of such best practices are:

- Crop rotation
- Fertilizer management and organic manure
- Switching from transient crops or pastures to agroforestry systems.
- Division and rotation of paddocks

- Forage and pasture management
- Animal welfare
- Physical soil protection in order to prevent overgrazing on soils
- Soil conservation associated, for example, with the reduction of tillage processes and the reduction of machinery operation

Information necessary to choose the option:

- Exhaustive review of scientific literature associated with the best low-emission agricultural and livestock practices which are applicable to the region
- Scientific knowledge and consensus on substantial contribution and expected impacts of such best practices

Advantages:

- Easy implementation, especially when the practices are commonly used in the country or region
- International references available for selection of best practices for agriculture and livestock activities
- Easy to verify the implementation of best practices compared to quantitative verification methods

Disadvantages:

- Lack of scientific accuracy to define the effective reduction of GHG emissions or impact on environmental objectives
- The results are obtained in long-term and are difficult to verify
- Risk of greenwashing in the absence of robust verification mechanisms

Examples of activities for which the option can be used: all types of agriculture activities (e.g., growing of perennial and non-perennial crops, hybrid systems) and livestock production.



Option-2: Estimation of GHG or carbon stock

This approach involves the quantitative estimation of GHG emission reduction or improvement in carbon stock during the investment period compared to the beginning of the investment period. A carbon management plan is often required to demonstrate the GHG reductions. Examples of such metrics are:

- Percentage reduction in tCO₂e during the evaluation period (e.g., percentage decrease in 10 years)
- Improvement in carbon stock during the evaluation period (e.g., tC/ha increase in 10 years)

Information necessary to choose the option:

- Methodologies to estimate GHG emissions across the supply chain
- Knowledge of the area, species and/or biomass using which the baseline and carbon stock data is calculated
- Information about the likelihood of adoption on such methods (e.g., technical capacity available in the country or region for small, medium, and large farmers)

Advantages:

- High technical accuracy
- Scientific basis for determining the GHG reductions
- Transparency from the technical point of view

Examples of activities for which the option can be used: all types of agriculture activities (e.g., growing of perennial and non-perennial crops, hybrid systems) and livestock production.

Disadvantages:

- Challenges and complexity for GHG and carbon stock estimations (below and above ground biomass)
- Scope-3 emission data is often challenging to obtain for the sector
- Lack of knowledge and specific data for baseline calculation
- Need for external technical support, especially for small farms which will make the option unviable
- Setting an absolute threshold (in terms of tC/ha) for carbon stocks is not a viable option, given the variability of carbon sequestration and storage potential, which is very context specific
- Difficulty in establishing a specific percentage for increase in carbon needed, which is more complex than establishing the relative emission reduction threshold



Exclusion of negative performance interventions

For both options 1 and 2, additional requirements where activities or interventions with negative contribution to the taxonomy objectives (interventions that cause harm) to the natural environment are excluded. This option cannot be applied as a standalone criteria and must be used as a complementary approach with the other options recommended under this sector. This objective here is to ensure that the production does not take place on land with high carbon stock such as:

- Wetlands
- Continuous forest areas
- Peatlands

Information necessary to incorporate such requirements:

- Information and mapping of all strategic ecosystems and high carbon lands in the country or region
- Clear definitions of high carbon-stock lands and protected areas



Option-3: Use of certifications

This option involves the use of certifications for sustainable agriculture and livestock management as proxies for considering the activities as taxonomy eligible. It is important to note that not all sustainable agriculture certifications can demonstrate substantial contribution to climate change objectives. Examples of such certifications include:

- Bonsucro
- CaucasCert
- EuroCert
- USDA Organic, among others

Information necessary to choose the option:

- Exhaustive review of certifications that are relevant for the country or region
- Information about the comparability of various certifications to determine equivalences
- Technical capacities installed in the country (certifiers, auditors, etc.)

Advantages:

- No data required for quantifying impacts
- A third-party entity oversees validating the production of sustainable products
- Certifications will ensure transparency and prevent greenwashing

Disadvantages:

- Represents an increase of costs for projects, limiting their applicability
- Mandating certifications will be challenging for small and medium farmers
- Global certification might not be well-adapted for local conditions
- Excludes uncertified farms that incorporate best practices and hence might restrict access to green finance



Considerations for other objectives

AFOLU sector activities have a direct impact on soil management, the use of water resources, biodiversity and other ecosystem services and natural heritage, which directly influence climate change mitigation and adaptation. Hence, the economic activities driven by this sector must prevent damage to other natural resources and enhance benefits through more efficient solutions with a smaller environmental footprint. Some examples of the considerations for avoiding harm to other objectives for activities of the sector are:

- Avoiding habitat modification and fragmentation
- Prevention and control in the use of agrochemicals (fertilizers and pesticides)
- Preventing soil erosion and compaction
- Controlling the impact on water resource as well as on water quality, that may be affected by high sediment, nutrient and agrochemical content
- Regulating the volume of water needed in the production unit, mainly in water-intensive crops
- Encouraging the use of native species from the original habitat
- Reducing pressure on the area's biodiversity and improve its climate resilience
- Reduce methane emissions in treatment plants (biodigesters, composting, etc)



Climate change adaptation

The increase expected in frequency of extreme weather events and changes in precipitation and temperature patterns, will directly influence the AFOLU sector, specifically the production quality and volume, threatening the region's food security. Some taxonomies have developed some adaptation criteria aimed at improving the adaptation and resilience of crops or forest plantations.

Examples of adaptation measures specific to this sector are described below:

- Increased areas cultivated with less susceptible crops or varieties to extreme weather
- Weather monitoring and forecast systems (e.g., early warning systems)
- Planting mangroves to protect coastal areas from flooding
- Installation of efficient water management systems (rainwater harvesting systems, water rationing and water recycling) and improvement of irrigation systems
- Integrated landscape management
- Income diversification to reduce the sensitivity of rural communities as a complement to agricultural livelihoods

2.5.5 Transportation



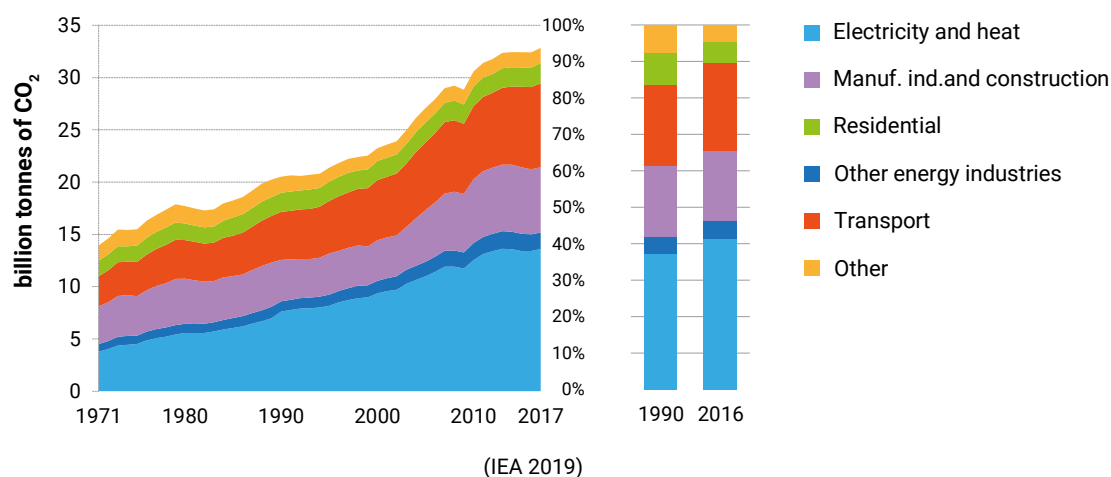
Background

Globally, the transportation sector is responsible for 23% of the GHG emissions. In LAC, the sector contributes to 36% of GHG emissions (IEA 2019) and is profiled as the subsector with the highest growth rate in emission generation in the coming decades. This is associated with factors such as increase in the rate of urbanisation and motorisation, greater demand for transportation, poor urban planning, growth in purchasing capacity, among others.

According to the Global Status Report on Transport and Climate Change, LAC is registering the highest growth in car ownership in the world: 58% between 2005 and 2015, more than double the world average of 27% as shown below:

Figure 15: GHG emissions and car ownership tendency in LAC

CO₂ emissions by sector globally



Car ownership rates per 1,000 people in Latin América and the Caribbean

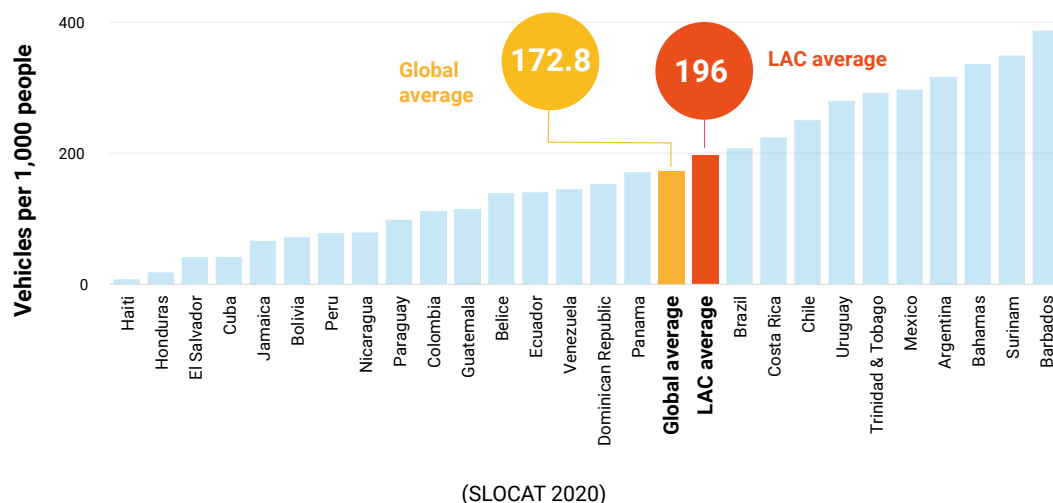




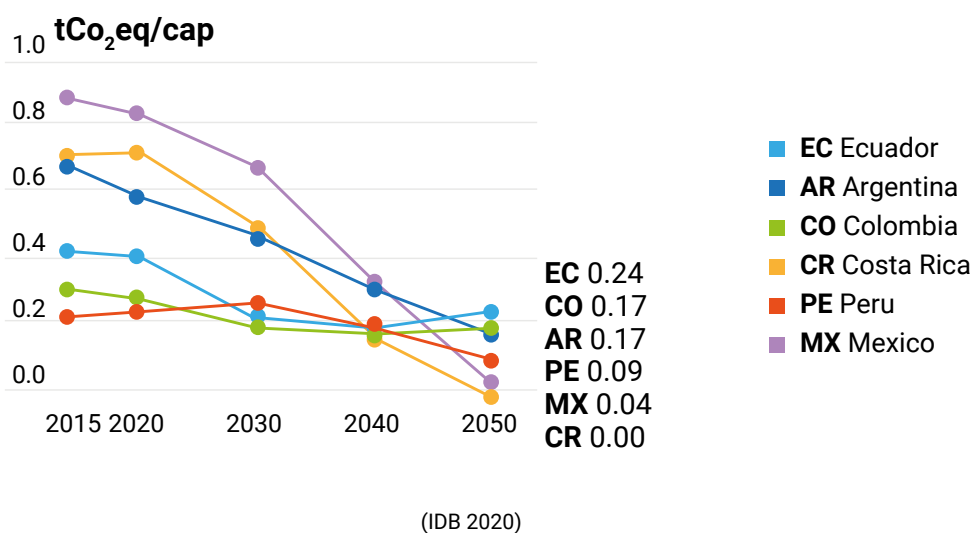
Photo: UCC

In Latin America alone, projections indicate that the vehicle fleet will triple in the next 25 years and the number of vehicles will increase by more than 200 million by 2050. As vehicle use increases, so does fuel demand and CO₂ emissions. The LAC region already has the third highest growth in oil demand after Asia and the Middle East (SLOCAT 2021).

The transportation sector plays a fundamental role in the reduction and mitigation of GHG emissions, and hence, decarbonisation is necessary to achieve the Paris Agreement goals.

According to the Deep Decarbonization Pathways (DDP) in LAC developed by the IDB in 2020, most of the countries evaluated under the DDP scenarios indicate a decarbonisation of passenger transport by 2050, especially in Costa Rica and Mexico. Ecuador shows an increase in emissions after 2040, given the increase in per capita transport demand (IDB 2020). Estimated trajectories for per-capita emissions from passenger transport is shown below:

Figure 16: Emissions from passenger transport per capita



In some LAC countries, reducing the modal share of cars and two-wheelers towards more collective transport is a key pathway towards deep decarbonisation. However, in other countries, such as Peru and Argentina, individual motorised mobility is estimated to increase to 52% and 70% respectively (IDB 2020).

Some of the key aspects for sector decarbonisation include expanding low-carbon public transport, fuel switch to sustainable sources, especially for electric vehicles, developing charging infrastructure, use of alternative fuels such as green hydrogen, modal shift, among others.



Taxonomy ambition

The ambition of the sector should be to ensure the following:

- Decarbonisation of transportation sector by 2050 using low-carbon transport (road, rail, water, and air)
- Increasing low-carbon public transport systems and modal shifts to low-carbon transport
- Building adequate infrastructure to support low-carbon transport
- Resilient low-carbon transport infrastructure

Taxonomies have included activities related to public and private transport of passengers and freight by road, rail, and waterways. The high emission activities of air and maritime transport are yet to be included in several taxonomies globally due to the challenges and unavailability of economically viable decarbonisation pathways⁴⁹. These modes of transport also need to achieve decarbonisation for the transport sector to align with the Paris Agreement goals.



Metrics

The substantial contribution of the transport sector to the climate objectives are defined using quantitative indicators in taxonomies to ensure their substantial contribution. However, for several activities related to low-carbon transport, taxonomies have also included direct eligibility criteria. The options for establishing metrics for the activities in the sector are described below. These options are not exclusive and can be used in combination depending on their relevance and applicability to the taxonomies:

- **Option-1**
Direct eligibility for low-carbon transport systems
- **Option-2**
Based on carbon intensity
- **Option-3**
Based on use of sustainable and alternative low-carbon fuels



Option-1: Direct eligibility for low-carbon transport systems

This approach involves considering direct eligibility for transport systems and infrastructure that are known to have zero emissions or support low-carbon transport systems.

⁴⁹. Electric planes and ships and related technologies are being developed and increasingly adopted by the industries; CBI, EU and Colombian Taxonomies have developed criteria for maritime transport.

Examples of such activities are:

- Electric and green hydrogen-based transport systems
- Zero emission micro mobility
- EV charging infrastructure
- Dedicated cycle lanes
- Electric urban railways

Information necessary to choose the option:

- Information about technologies and infrastructure that support low-carbon transport and substantially contribute to the climate change objectives
- Potential adverse impacts of such technologies

Advantages:

- Easy to implement and removes the need for verification in case of direct eligibility
- No data required for establishing thresholds
- Substantial contribution is implicit

Disadvantages:

- This pathway does not include assessment of Well to Wheel emissions, i.e. in the life cycle of the production of electric power, hydrogen or other fuel used in the vehicle.
- Does not consider process efficiencies
- Risk of implementation of low-efficiency technologies
- Life cycle emissions of low-carbon transport can be significant (e.g., emissions of the manufacture of construction materials)

Examples of activities for which the option can be used: all electric and green hydrogen or other zero emission modes of transport.



Option-2: Based on carbon intensity

This approach uses carbon intensity thresholds to determine the eligibility of the transport activity. The carbon intensity thresholds are usually defined using a science-based trajectory (e.g., IEA's mobility model) and are revised periodically.

Examples of such metrics are:

- Public transport metrics based on GHG emissions per passenger-distance (gCO₂/p-km)
- Freight transport by rail based on GHG emissions per unit of freight transported (gCO₂/ton-km)

Information necessary to choose the option:

- Availability of reference trajectories and pathways for decarbonisation
- Information of the current levels of carbon intensity for different modes of transport in the country or region

Advantages:

- Quantitative measurable impacts that have a clearly defined pathway for decarbonisation
- Science-based criteria and comparable globally with other taxonomies

Disadvantages:

- The lack of availability of relevant updated data and information may affect the calculation of thresholds for this pathway
- Requires periodic revision of the thresholds to ensure alignment with the decarbonisation pathways

Examples of activities for which the option can be used: passenger and freight transport activities by different modes.



Option-3: Based on use of sustainable and alternative low-carbon fuels

This approach involves considering eligibility for transport systems based on the use of sustainable fuels.

Examples of this include operation of vehicle fleets in which fossil fuels are replaced by low or zero carbon fuels, such as advanced biofuels, biogas, synthetic fuels, among others.

Information necessary to choose the option:

- Information on sustainable fuel alternatives that lead to a substantial contribution of the transportation modes without transferring the environmental impact to other sectors (AFOLU for example).
- Life cycle emissions of biofuels produced or used in the country or region
- Information about hybrid and alternate fuel vehicle types available in the market

Advantages:

- Easy implementation and verification
- Easy to retrofit fossil fuel vehicles to use alternate fuels (e.g., biodiesel buses)
- Can serve as a short-term solution for transition activities (e.g., air and maritime transport)

Disadvantages:

- Difficulty in establishing and ensuring a verification mechanism to guarantee the sustainability of the alternative fuel
- Risk of use of unsustainable fuel during the vehicle operation that can cause adverse impact in other sectors and supply chains

Examples of activities for which the option can be used: air and maritime or fluvial transport, road, and rail transport as a short-term solution (in case of biofuels).

**Considerations for other objectives**

In addition to contributing to the climate objectives, it is important that the activities do not cause harm (DNSH) to other environmental and social objectives. Some of the considerations for DNSH are:

- Circular economy and recyclability of end-of-life vehicles, reusing parts and using recycled material during infrastructure renovation, upgrading and construction
- Pollution control and prevention, due to direct emissions of exhaust gases from internal combustion engines (NO_x, THC, NMHC, CO and PM), as well as preventing noise pollution
- Minimising environmental impacts that are potentially generated by the infrastructure on ecosystems and people, as well as optimizing materials processing
- Improving the resilience of transportation infrastructure

**Climate change adaptation**

The transportation sector may be affected by the materialisation of physical risks derived from climate change. To abate the effects of climate change, the transport sector needs to be resilient to the impacts of extreme weather and adapt accordingly. Examples of adaptation measures specific to the sector are described below:

- Physical resilience of transportation systems and infrastructure against extreme weather events (e.g., improving drainage of roads to prevent damage due to excessive rainfall)

- Restoration of transport infrastructure systems after extreme events
- Increasing connectivity for remote areas
- Investigations and studies to determine the vulnerability factors in the transport networks that may affect nodes and lines, as well as operations, and identify possible interventions to reduce such impacts (Concepto Logístico (2021))
- Updating construction standards, maintenance practices, among others, that incorporates strategies to improve resilience

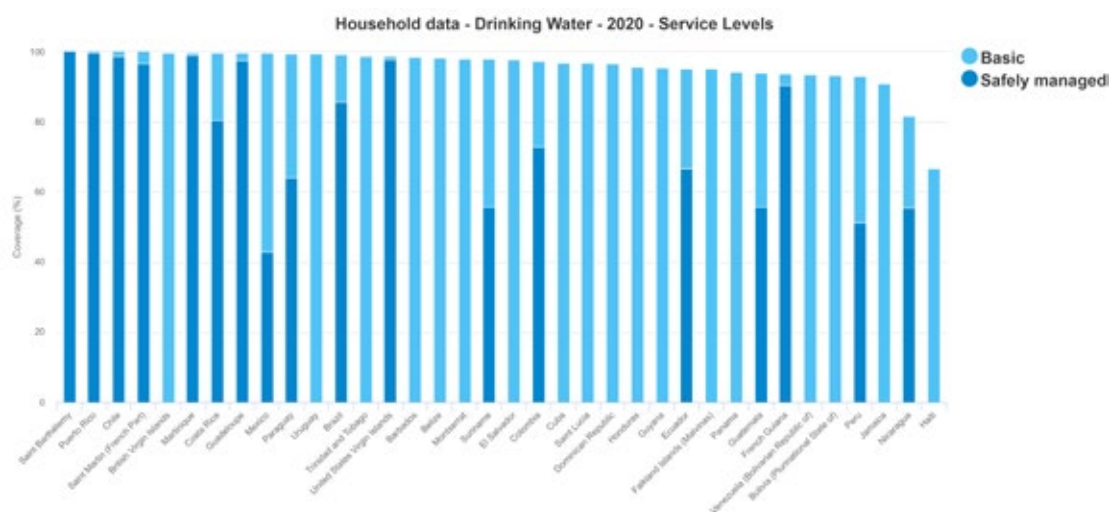
2.5.6 Water



Background

The LAC region has abundant water resources and yet, there is an inefficient use of water in almost all countries. Moreover, there has been an increase in demand with the region's population hitting 644 million, with 80% urban population. Despite this, less than 1% of GDP is spent on infrastructure, which has resulted in almost 26% of the LAC population (around 166 million) still do not have access to a drinking water supply. The countries with the least access to drinking water in Latin America are Haiti, Nicaragua, Jamaica, Peru, and Bolivia (UNICEF 2022). The summary of access to safe drinking water in LAC countries are shown below:

Figure 17: LAC Household data - drinking water safe levels (2020)



(WHO-UNICEF 2022)

With respect to sanitation, less than 40% of the population enjoy safely managed sanitation, and only about 60% of the population is connected to a sewage system. LAC region is also lacking adequate infrastructure to efficiently manage its wastewater, as only 30-40% of region's wastewater that is captured is treated, and the rest is discharged to rivers without being treated (IFC 2020). Thus, universal coverage in water and sanitation is one of the key regional goals and it has been estimated by ECLAC that it would take an annual investment of 1.3% of the regional GDP until 2030 to achieve the same. Apart from the social and environmental benefits, these investments could generate 3.6 million new jobs per year in the case of drinking water and sanitation and thus boost the economy of the region (ECLAC 2022). The sector also is important for activities in other sectors (e.g., Manufacturing). The availability, use and efficiency of water for industrial processes can significantly affect industrial production, especially for water-intensive activities such as food and beverage industries.



Taxonomy ambition

The ambition of the sector should be to ensure the following:

- Efficient and resilient water supply and sanitation systems
- Improve access to safe potable water and sanitation
- Efficient and resilient collection, distribution, and treatment systems
- Efficient management of water resources
- Protection of aquifers, catchments, river basins, and ecosystems

From a climate change adaptation point of view, most taxonomies have covered climate change adaptation related activities transversally based on vulnerability risk assessments. However, some have specified adaptation related activities such as efficient stormwater systems, flood defences and nature-based solutions, water saving and protection systems, among others. Some taxonomies require a detailed assessment and implementation of adaptation and resilience characteristics of water management infrastructure (e.g., CBI). From a mitigation point of view, taxonomies have covered activities related to potable and wastewater systems and water saving technologies.



Metrics

The substantial contribution of potable water treatment, distribution and supply systems are based of efficiencies such as unit energy consumption or reducing leakage and for wastewater systems, the contribution to climate objectives is mostly intrinsic. Activities related to adaptation and resilience have direct eligibility when the contribution is evident (e.g., flood defence systems) but they mostly require detailed vulnerability and risk assessments. The options for establishing metrics commonly used in taxonomies are described below. These options are not exclusive and can be used in combination depending on their relevance and applicability to the taxonomies:

- **Option-1:** Energy efficiency or GHG reduction indicators
- **Option-2:** Water losses and leakage indices
- **Option-3:** Percentage of water savings
- **Option-4:** List of requirements to ensure process efficiency
- **Option-5:** Vulnerability and risk assessments



Option-1: Energy efficiency or GHG reduction indicators

This approach includes establishing specific quantitative criteria to ensure that the activity results in an efficient process and reduce GHG emissions. Examples of such requirements are:

- Energy consumption per m³ of water collected and treated (e.g., kWh/m³ drinking water produced)
- Percentage of energy reduction per m³ of drinking water supplied or wastewater treated
- Energy consumption per m³ of treated wastewater (kWh/ m³ treated wastewater or per Population Equivalent)
- Net reduction of GHG emissions (e.g., current or expected reduction of net GHG emission over the project lifetime)

Information necessary to choose the option:

- Baseline data of energy consumption or GHG emissions of the top-class efficient systems
- Energy efficiency data for individual processes (e.g., water treatment and distribution)

Advantages:

- Thresholds will be directly linked to GHG reductions
- Easy to monitor progress and establish declining thresholds

Disadvantages:

- The metric is not applicable to all utility companies and systems because energy efficiency or GHG reduction is not always used as an indicator to measure efficiencies
- Efficiencies may depend on geography (e.g., mountainous regions require more energy to pump water compared to flat regions)

Examples of activities for which the option can be used: Potable and wastewater treatment systems, supply and distribution systems.



Option-2: Water losses and leakage indices

This approach includes establishing specific quantitative criteria based on reduction of water losses in the systems. Examples of such requirements are:

- Leakage indices (e.g., ILI = Actual Losses/Unavoidable Losses for water supply infrastructure)
- Reduction of losses in existing systems (e.g., IPUF in Colombia – m³/user. month)
- Avoidance of losses (e.g., Minimal or no loss in new infrastructure)
- Implementation of leakage detection and monitoring systems

Information necessary to choose the option:

- Baseline data of losses of water utility companies and distribution networks
- Availability of methodologies or standards to measure leakage data

Advantages:

- Positive impact on water resources and reduces wastage
- Acts as an indirect measurement of system efficiency and GHG emissions

Disadvantages:

- Measuring such indicators can lead to increased maintenance and operations costs, especially in existing systems due to the necessity of implementation of monitoring systems
- Difficult to detect and minimize leaks in large distribution networks

Examples of activities for which the option can be used: Water supply and sewage systems including distribution networks.



Option-3: Percentage savings of water consumption

This approach includes establishing specific quantitative criteria based on reduction of water consumption due to efficient technologies or processes. Examples of such requirements are:

- Percentage savings in water consumption
- Implementation of technologies and processes related to reuse of treated water, rainwater harvesting, among others that lead to reduction of water consumption by a defined percentage

Information necessary to choose the option:

- Baseline data of water consumption that helps determine the water savings threshold
- Adequate information to determine reduction goals across sectors and activities (e.g., water consumption data for buildings, industrial processes, irrigation, etc.)

Advantages:

- Easy to implement
- Ensures promotion and development of new technologies that are efficient

Disadvantages:

- Difficult to define reduction targets when there is no baseline data available
- Reduction goals may vary for different activities (e.g., agriculture, buildings, textile industry, etc.)

Examples of activities for which the option can be used: Technologies, equipment, and infrastructure to achieve water consumption efficiency (e.g., efficient sanitary systems, rainwater harvesting, greywater recycling plants).



Option-4: List of requirements to ensure process efficiency

This approach considers establishing quality control requirements to ensure that the activities are part of an efficient and adequate management process. Examples of such requirements are:

- Improving process efficiency (e.g., increased volume of wastewater treated, higher removal of organic load from wastewater)
- Prevention of methane leakage (e.g., during sludge or wastewater treatment using anaerobic systems)
- Reduction of net GHG emissions

Information necessary to choose the option:

- Information about current practices and technologies for economic activities
- Information about the impact of processes on climate change mitigation and adaptation (e.g., GHG reduction due to anaerobic digestion of sewage sludge, flood defence systems for coastal infrastructure)
- References and benchmarks (e.g., treated water discharge limits)
- Local context for including the activities (e.g., information about the common processes and practices in the country)

Advantages:

- Easy to implement
- No data required for establishing thresholds
- Substantial contribution is implicit

Disadvantages:

- Does not consider process efficiencies of activities
- Risk of implementation of low-quality technologies

Examples of activities for which the option can be used: wastewater treatment systems, treatment of sewage sludge, flood protection systems



Option-5: Vulnerability and risk assessments

This option involves conducting detailed studies to determine the eligibility of the activity. This mostly applies to climate change adaptation activities which often require site specific assessments to determine the risks and vulnerability of assets to extreme weather events. Some of the considerations for such assessments include the following:

- Efficient allocation of water resources
- Governance and effective management of water resources
- Technical assessment including hydrological and climatic risks
- Favouring solutions based on nature, blue and green infrastructure
- Adaptation plans
- Adaptability and resilience of the assets

Information necessary to choose the option:

- Catchment, river basin, aquifer, topography, and hydrological data
- Information about ecosystems and settlements that are affected by the activity
- Information on governance and water allocation
- Climate and hydrological models
- Risk assessment due to different climate events

Advantages:

- Detailed assessment that can help plan resilient systems
- Considers all potential climate events and reduces risks to the assets
- Typically considers long-term resilience for infrastructure
- Positive impact on society and reduction of economic losses

Disadvantages:

- Time consuming
- Difficulty in obtaining required data for the assessments
- Requires specialists to conduct such assessments
- Vulnerability assessments can be expensive
- Can be difficult for small users and projects

Examples of activities for which the option can be used: storage of water, flood protection systems and all adaptation activities under the sector.

**Considerations to avoid harm to other objectives**

In addition to contributing to the climate objectives, it is important that the activities do not cause harm (DNSH) to other environmental and social objectives. Some of the considerations for DNSH for activities of the sector are:

- Avoid damage to other environmental objectives, especially pollution and protection of water resources
- Wastewater treatment and proper discharge to avoid downstream contamination
- Sludge management and prevention of contamination to soil due to its application
- Proper handling of lubricants, oils and other hazardous waste generated in the operation of treatment systems

- Proper disposal of separated waste from sewer networks and wastewater treatment plants
- Prevention of methane leakage (for treatment using anaerobic systems)



Adaptation

The Water sector is extremely vulnerable to climate change and can impact other sectors adversely (e.g., reduced precipitation causing losses in agriculture). Most of the taxonomies have covered adaptation criteria in a traversal manner but a few taxonomies have specifically included adaptation and resilience activities under the Water sector (e.g., flood defence and nature base solutions). The metrics for adaptation activities under the sector are mostly related to option-5 as explained earlier and examples adaptation related aspects are listed below:

- Preference for nature-based solutions (e.g., Sustainable drainage systems (SuDS))
- Protection of nature and natural capital (e.g., wetlands, mangroves)
- Protection and effective management of watersheds and aquifers (e.g., groundwater protection and allocation)
- Promotion of blue and green infrastructure (e.g., bioswales and green urban spaces)
- Improvement of stormwater drain capacities, especially for urban infrastructure
- Water management and storage (e.g., reservoirs)
- Monitoring and meteorological systems (e.g., for monitoring weather events)
- Resilience of potable and wastewater infrastructure, among others

2.5.7 Waste



Background

LAC countries generate over 200 million tons of solid waste annually of which less than 10% is recycled. Approximately 40 million people lack access to adequate waste collection and the waste generated by about 27% of the regional population is disposed in unscientific open dumpsites (UNEP 2018). The recycling rates range between 1-17% in LAC and the role of informal sector in effective waste management is a critical element in the region. The sector contributes to approximately 5% of the GHG emissions (UNEP 2018).

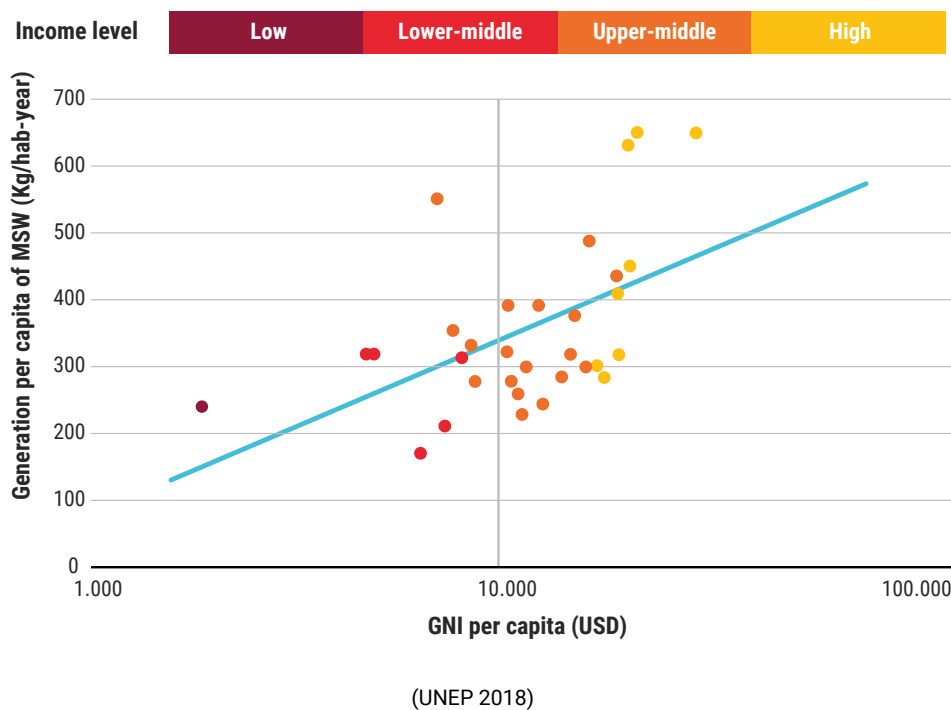
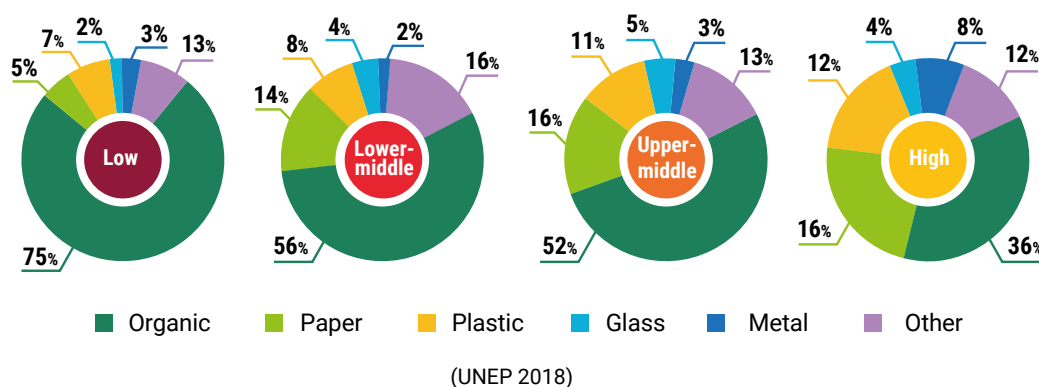
The efficiency of the sector is also influenced by sustainable and circular processes in activities of other sectors (for example, manufacturing). Changing the production systems from linear to circular models, improving

material and supply chain efficiencies, changing product and process design to ensure reparability and reduction of material losses, among others will reduce the impact on waste management systems and infrastructure.

The effectiveness of waste management should meet the needs of all genders through equal participation for policy development and incorporating gender analysis for establishing a gender responsive waste management sector (GenderCC 2020).

The waste characteristics and quantities vary depending on the region and have a strong correlation with economic growth as shown below

Figure 18: Variation of waste characteristics and quantity in LAC



Taxonomies should cover activities across the value chain of waste management from generation, collection and transport to efficient treatment systems and scientific end disposal.

Activities related to management of waste such as hazardous and contaminated, construction and demolition, electronics, and batteries, etc. might not have a direct impact on climate change mitigation but can contribute substantially to other objectives such as circular economy and pollution control or prevention.



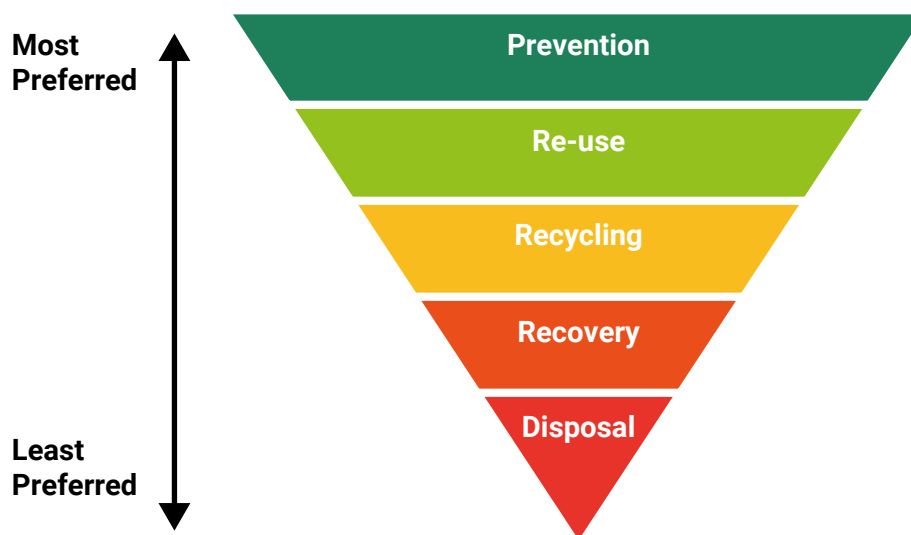
Taxonomy ambition

The ambition of the sector should be to ensure the following:

- Efficient collection and transport
- Utilisation of waste for reuse or recycling and promotion of circular economy
- Scientific treatment and adequate final disposition
- Follows the waste management hierarchy

The waste management hierarchy as shown below can act as a guiding factor to select activities and to establish metrics and thresholds:

Figure 19: Waste management hierarchy



(ISM Waste and Recycling 2021)



Metrics

The substantial contribution of several waste management activities to the climate objectives are intrinsic and hence in majority of taxonomies, quantitative metrics and thresholds have not been used to determine the eligibility of activities under the sector. For some activities related to recycling and energy recovery, quantitative

indicators might be necessary to ensure their substantial contribution. The options for metrics commonly used in taxonomies are described below. These options are not exclusive and can be used in combination depending on their relevance and applicability to the taxonomies:

- **Option-1:**
List of requirements and checks to ensure process efficiency
- **Option-2**
Efficiency thresholds (e.g., for recycling, energy efficiency)



Option-1: List of requirements and checks to ensure process efficiency

This approach considers establishing quality control requirements to ensure that the activities are part of an efficient and adequate management process. Examples of such requirements are:

- Ensuring that the waste is separated at source
- Process efficiency (e.g., ensuring recovery of materials for recycling)
- Use of by-products (e.g., compost, biogas, recyclables)
- Prevention of methane leaks (e.g., in Anaerobic digestion facilities)
- Adherence to waste management hierarchy (e.g., energy recovery using incineration facilities only when recycling infrastructure is not available)
- Compliance with local standards and regulations (e.g., compost quality, air emissions meeting national regulations)

Information required to choose the option:

- References and benchmarks (e.g., compost quality)
- Local context for applying the activity (e.g., information about the common processes and practices in the country)
- Availability of waste and circular economy legislations and standards

Advantages:

- Easy to implement
- No data required for establishing thresholds
- Substantial contribution is implicit

Disadvantages:

- Does not consider process efficiencies
- Risk of implementation of low-quality technologies

Examples of activities for which the option can be used: Collection and transportation, composting, anaerobic digestion, methane capture from landfills, closure of dumpsites.



Option-2: Efficiency metrics

This approach includes establishing specific quantitative criteria to ensure that the activity result in an efficient process and does not allow for inefficient systems. Examples of such requirements are:

- Efficiency of recovery (e.g., Material Recovery Facilities with a minimum material percentage of recyclables recovered for secondary use)
- Process and energy efficiency (% gas capture efficiency in landfills, Minimum energy efficiency of incineration facilities)
- Carbon intensity criteria

Information required to choose the option:

- Data related to process efficiencies or carbon intensities of the most efficient systems (e.g., carbon intensity of the top 15% energy recovery facilities)
- Process efficiency information (e.g., recycling, energy and bottom ash recovery)
- Information about efficiencies of processes and technologies

Advantages:

- Only activities with high efficiencies and those that substantially reduce GHG emissions are considered
- Avoids low-quality technologies and prevents greenwashing

Disadvantages:

- Need for data and methodologies for calculations
- Complex to implement and needs verification mechanisms or protocols

Examples of activities for which the option can be used: Material Recovery Facilities, thermal treatment, anaerobic digestion and methane capture in landfills.



Considerations to avoid harm to other objectives

In addition to contributing to the climate objectives, it is important that the activities do not cause harm (DNSH) to other environmental and social objectives. Some of the considerations for DNSH are:

- Avoid damage to other environmental objectives, especially pollution and circular economy

- Treatment and safe disposal of contaminants (e.g., leachate, ash, particulate matter, etc.)
- Wastewater treatment
- Treatment of air emissions (especially of waste to energy activities)
- Treatment and adequate disposition of rejects and non-recyclable waste
- Waste stabilisation before final disposal
- Minimum social safeguards (e.g., integration of the informal sector)



Climate change adaptation

To abate the effects of climate change, the waste management sector needs to be resilient to the impacts of extreme weather and adapt accordingly. Some of the impacts that climate change could affect waste management activities are:

- Flood risks for contaminated sites, dumpsites, composting plants that can pollute soil and water bodies
- Fire hazards in landfills due to increased temperature
- Increased rainfall leading to increased volume of drainage in landfills and causing ground instability
- Change of waste decomposition characteristics (effect of temperature and humidity on processes)
- Debris management due to natural disasters
- Contaminated materials (e.g., PCBs) in construction ending up in debris, leachate, or solid waste management processes.

2.5.8 Information and Communications Technology



Background

The Information and Communications (ICT) sector is a rapidly growing sector and the associated increase in energy consumption and GHG emissions of the sector is a big concern for its sustainable growth. Since 2015, the sector has accounted for 3.6% of the total energy consumption and 1.4% of CO₂ emissions globally representing about 730 megatons of CO₂ with an estimated growth of about 12% by 2030 (ECLAC 2021) (ITU 2020).

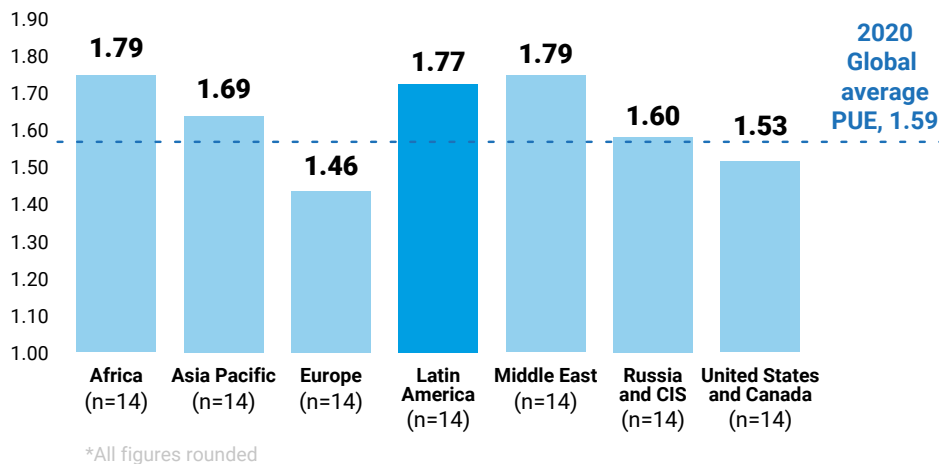
On the other hand, the high potential of the digital transformation can help reduce carbon footprint of other sectors of the economy, especially in emerging markets such as the LAC countries. By 2030, it is estimated that the use of digital technologies can reduce carbon emissions by up to 12Gt, or 15% of total global emissions. This

can be attributed to digital solutions in various sectors such as manufacturing, agriculture, optimisation of mobility and transport systems, dematerialisation of the economy, distance education, among others (ECLAC 2021).

In the LAC context, based on the information from the ITU and UNCAD databases, the region has had an important growth for the sector during the last decade. The access to the internet since 2012 has increased by over 35%, with Chile, Bahamas, Uruguay, and Costa Rica being the countries with the highest penetration of internet use greater than 80%, on the contrary Honduras, Nicaragua and Haiti had less than 46% coverage in 2020 (World Bank 2022).

Due to the rapid development of this sector, it is important to identify and mitigate the factors that contribute to the increase of the carbon footprint, to develop public and private strategies for sustainable growth. The following key aspects considerably impact the digital environmental sustainability:

- The impact of the operations of telecommunication networks whose global GHG emissions was estimated at 169 megatons of CO₂ in 2015, which was mainly due to the high energy consumption (242TWh) (Malmodin and Lundén 2018). Most of the emissions in operations can be attributed to energy consumption (Lundén, et al. 2022).
- Impact of manufacturing of electronic devices: The manufacturing of ICT equipment in LAC is marginal compared to Asia and North America. However, the final disposal of electronic waste is a factor to consider for the sustainability of the sector in the region. During 2017, a total of 46,000 kilotons of electronic waste were generated globally, of which 9% correspond to LAC (BID 2018), presenting an annual growth above the world average. While manufacturing is covered in taxonomies under the Manufacturing or Industrial sectors, DNSH criteria, especially for circular economy for ensuring safe end-of-life recycling and disposal for ICT activities is key to avoid adverse effects.
- Finally, the power consumption of data centres is an important factor to consider due to the growth in data traffic and other activities such as cryptocurrency mining in some countries in the region. Even though data traffic globally multiplied by 16 times and data centre workloads by 9 times between 2010 and 2020, the use of electrical energy in data centres changed minimally during the same period (Kamiya 2022). This is due to constant and accelerated improvement in the efficiency of computer equipment, efficient design, and operation of data centres. In the regional context, the energy efficiency levels of data centres in LAC is 6.9% below the global average (Lawrence 2020); therefore, it is necessary to establish strategies aimed at improving the efficiency in the use of energy. Data centre activities have been covered in most of the taxonomies globally. To measure the efficiencies of data centres, efficiency indicators such as Power Usage Effectiveness (PUE) have been used globally. Certifications such as Green Seal are also often used for labelling efficient data centres. The following image shows the average PUE in LAC compared to rest of the world:

Figure 20: PUE of data centres⁵⁰

(Uptime Institute 2020)



Taxonomy ambition

The ambition of taxonomies for the sector with respect to climate change objectives are to:

- Achieve net zero GHG emissions for the ICT infrastructure
- Digital transformation and data monitoring for optimising efficiency of processes
- Increasing adaptation and resilience of assets and activities

The activities covered under the sector in taxonomies globally include data processing and hosting infrastructure such as IT equipment, data centres, monitoring systems (e.g., data processing, weather and climate monitoring), digital solutions and software development, individual measures, and other related services.



Metrics

The substantial contribution of several activities of ICT to the climate objectives are intrinsic but quantitative indicators might be necessary to ensure substantial contribution of IT infrastructure. The options for establishing metrics that are commonly used in taxonomies are described below. These options are not exclusive and can be used in combinations depending on their relevance and applicability to the taxonomies:

- **Option-1:** Energy efficiency metrics
- **Option-2:** Use of certifications
- **Option-3:** List of requirements and checks to ensure process efficiency

50. A low PUE indicates a higher efficiency of the data centres.



Option-1: Energy efficiency metrics

This approach involves establishing specific and quantitative thresholds that are based on parameters of energy efficiency of the infrastructure, buildings and the IT equipment (e.g., for data centres, computer equipment).

Examples of such metrics are:

- PUE limit for data centres to qualify as green investments
- Energy efficiency levels for the IT equipment such as computers and servers, among others

Information required to choose the option:

- Baseline data of energy efficiency for buildings (e.g., for data centres and green buildings)
- Data of indices such as PUE, among others
- Information about standards and labels related to energy efficiency of IT equipment

Advantages:

- Thresholds directly linked to the energy efficiency and GHG emissions
- Science-based and comparable internationally

Disadvantages:

- Baseline data might not be available in all countries, and it is difficult to apply the metrics in absence of such information
- Indices might not consider local characteristics and could lead to bias (e.g., PUE for data centres are highly influenced by climate of the location. Warm regions require more energy for cooling compared to cold regions)

Examples of activities for which the option can be used: Data processing, hosting and related activities including data centres and IT equipment.



Option-2: Use of certifications

This approach is simple and involves demonstration of compliance with high standards of efficiency using certifications. Examples of such criteria are:

- Data centres with ICRA Green Seal certification
- IT equipment with highest efficiency rating level (e.g., Energy Star) which are applicable in the local context or available locally

Information required to choose the option:

- Information about certifications that are applicable to the local context
- Comparison of efficiency levels of data centres or IT infrastructure with respect to the certification standards
- Technical capacity established in the country or region (e.g., availability of auditors)

Advantages:

- Easy to implement
- No need to obtain baseline data for the activities
- Globally acceptable and comparable
- Established verification methods and hence ensure transparency

Disadvantages:

- Requires comparison of different certification systems
- Certifications related to data centres are limited
- Can represent additional costs, thus limiting their applicability

Examples of activities for which the option can be used: Data processing, hosting and related activities including data centres and IT equipment.



Option-3: List of requirements and checks to ensure process efficiency

This approach considers establishing quality control requirements to ensure that the activities are part of an efficient and adequate management process. This is applicable to activities whose substantial contribution is implicit. Examples of such requirements are:

- Climate monitoring and weather forecasting systems
- Digital solutions for optimisation of industrial processes
- Development of software that increase efficiency of supply chains and reduce material loss

Information required to choose the option:

- Identification of ICT activities, solutions and services that have significant contribution to climate change mitigation and adaptation
- Local context for applying the activity (e.g., information about the common processes, technologies used in the country)

Advantages:

- Easy to implement
- No data required for establishing thresholds
- Substantial contribution is implicit and hence no additional verification indicators are necessary

Disadvantages:

- Does not consider process efficiencies
- Risk of implementation of low-quality technologies and processes

Examples of activities for which the option can be used: Development of digital solutions including software, monitoring and data analysis systems, extreme weather warning systems.

**Considerations to avoid harm to other objectives**

In addition to contributing to the climate objectives, it is important that the activities do not cause significant harm (DNSH) to other environmental and social objectives. Some of the considerations for DNSH for activities of the sector are:

- Adequate disposal of electrical and electronic waste
- Promotion of circular economy in manufacturing and downstream recycling processes
- Use of environmentally friendly refrigerants in cooling systems
- Ensuring sustainable construction of data centres

**Climate change adaptation**

The ICT sector plays an important role in helping other sectors and activities adapt to climate change and to make systems resilient. Connectivity and digital transformation also have direct impacts on societies and environment. Some of the impacts of climate change that could affect activities of the sector and areas where ICT sector can play a significant role for adaptation are:

- Changing temperature regimes that affect the energy demand of data centres
- Protection of telecom network against extreme weather
- Disaster warning and monitoring systems (e.g., forest fires, hurricanes)

- Smart data collection, monitoring, analysis, automation, and decision-making
- Climate modelling, planning, and improving resilience of urban infrastructure
- Smart agriculture management systems to reduce crop loss
- Efficient water management, aquifer and catchment mapping and planning of water supply infrastructure
- Research and investigation of climate change

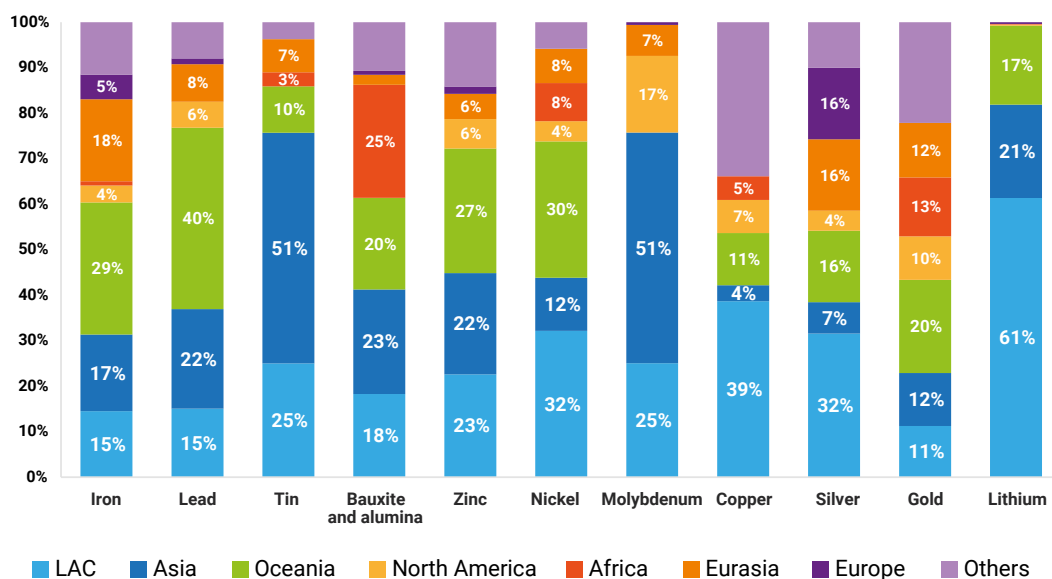
2.5.9 Mining

Background

To transition to a low-carbon economy and ensure decarbonisation of sectors by implementing zero emission technologies such as electric mobility, batteries, renewable energy, etc, it is necessary to ensure the availability of raw materials for their production. This transition will require minerals that are of strategic importance such as lithium, nickel, copper, cobalt, gold, rare earths, aluminium, among others (IEA 2022).

Latin America is projected as an important region for securing key mineral supply chains, with 61% of global lithium reserves, 39% copper and 32% nickel. Chile is also the largest producer of copper worldwide (28% of global supply) and the second largest producer of lithium behind Australia (IEA 2022). The global growth is estimated to increase the demand by 42 times for lithium, 19 times for nickel and 2 times for copper by 2040 (IEA 2022).

Figure 21: Reserves of selected minerals



(ECLAC 2019)

The global transition results in a series of challenges and opportunities for the region that are worth mentioning. Inadequate management of the mining processes can lead to increased GHG emissions due to process inefficiencies and other adverse environmental and social impacts such as the loss of biodiversity due to land use change, water and air pollution, soil contamination from mining waste and effluents, displacement of communities, among others.

In the specific case of lithium, whose largest reserves worldwide are found in the salt deposits in Argentina, Chile and Bolivia (commonly called as the “Lithium Triangle”), its mining carries a high risk of water contamination due to extraction techniques by evaporation of lithium brine; however, the use of sustainable methods such as Direct Lithium Extraction, can reduce water use by up to 98 % (Vander Molen 2016), reducing its environmental impact and shortening the process of obtaining the mineral. Similarly, efficient extraction methods for other minerals that reduce negative impacts must be implemented for all mining processes to ensure sustainability.

With respect to copper, most new mining projects are in Latin America, with a 100% growth in primary copper production expected in the decade (IEA 2022). However, copper extraction generates 16 times more emissions per ton than steel (0.727 tCO₂/t), (BID 2021) which is mainly due to the decline in the quality of ore, whose copper concentration reduced from 1.25% in 2011 to 0.65% in 2017, resulting in a 130% increase in fuel consumption (IEA 2022). Considering that 47% of emissions in Chile are the product of the use of fuels, and 88% of these correspond to the transport of ore (BID 2021), electrification has the potential to reduce emissions by two thirds. This, combined with the use of renewable energy in one of the areas with the highest solar radiation in the world, can reduce the carbon footprint per ton by up to 80% (IEA 2022).

Mining of strategic minerals is critical for transition and is hence important to ensure the sustainability of the entire value chain.



Guidance for metrics

Taxonomies currently have not developed technical criteria for the mining sector but considering the importance of the sector for LAC and for global transition of countries to low-carbon economies, mining of strategically important minerals must be considered in taxonomies in LAC⁵¹.

The metrics for activities of the sector should consider the following aspects for the climate objectives:

- **Substantial contribution:** The substantial contribution of mining, especially that of strategically important minerals are implicit as these are essential for the decarbonisation of other sectors of the economy. It is important to have such minerals mined to meet the demand of the manufacturing sector for producing low-carbon products and technologies. The principal objective is to extract such minerals in a sustainable manner.

51. Mining of fossil fuels should not be included as they go against the guiding principles and objectives of the taxonomy

- **Process efficiency:** The process of extraction of minerals are intensive in GHG emissions and needs to be mitigated in all areas such as during discovery, material movement, ventilation, mineral processing, and general operations (The Warren Centre 2020). The entire supply chain of mining processes and the life cycle emissions must be evaluated for establishing process thresholds which must be based on carbon intensity (GHG emissions per unit mineral mined).



Considerations to avoid harm to other objectives

The most important consideration for ensuring sustainable mining of strategic minerals is to ensure no harm to other environmental and social objectives. Mining processes are known to generate significant adverse impacts during the extraction processes and in several cases in the region, have caused social conflicts. Latin America is also the region with highest number of social conflicts due to mining globally (ECLAC 2019). Examples of considerations for DNSH criteria for mining activities of the sector are described below:

- Minimisation of waste generation through the operations
- Stabilisation, treatment, and adequate disposal of hazardous waste
- Effluent wastewater treatment and prevention of contamination upon discharge to water bodies
- Use of zero-emission vehicles for material movement
- Prevention and control of emissions such as particular matter and dust, among others
- Avoiding mining in protected or biodiverse areas
- Ensuring community and societal consensus, especially for mines located in sensitive areas
- Ensuring the safety, health and education of the workers, especially women who work in mines.



Climate change adaptation

The mining sector is also affected by climate change and needs to adapt to ensure resilience. Some of the impacts of climate change that could affect the activities of the sector are (Nelson and Schuchard, n.d.; Golder 2021):

- Increased precipitation and rainfall intensities that risk the stability of the mines
- Risk of flooding
- Water shortage, hampering the overall operations including extraction processes
- Increased energy demand for cooling due to hot temperatures
- Extreme weather events affecting supply chain and distribution

- Impact on working conditions due to extreme weather
- Increase in liability and remediation costs due to risks such as flooding, non-availability of water, among others
- Increase insurance premiums due to increased risk of operations
 - Necessity of periodic gender-responsive vulnerability and risk assessments considering changing climate

2.5.10 Adaptation related activities across sectors

Climate change adaptation aims to reduce the risks or vulnerabilities posed by climate change and to increase climate resilience. Likewise, it is important to highlight again the importance of developing adaptation activities to avoid or mitigate the materialisation of different physical and transitional risks that could directly affect the financial and economic system at regional and global level (NGFS 2019).

The increased pace of economic growth and urbanisation in emerging markets and developing countries (EMDCs), has further increased the importance of climate change adaptation as EMDCs are the most vulnerable to impacts of climate change. But there is a dearth of financial resources available to economies to adapt to climate change. In 2021, multilateral development banks allocated a total of \$50.7 billion for climate change mitigation and adaptation finance in low- and middle-income economies. Of this total, \$17.6 billion (35%) was allocated to climate change adaptation finance, of which 16% was specifically directed to the LAC region, mainly for institutional capacity support or technical assistance. On the other hand, \$33 billion (65%) was allocated for climate change mitigation finance, of which LAC received approximately 20% mainly for energy and cross-sectoral activities (MDB 2021).

A key challenge with climate change adaptation financing, is the varying methodologies to define climate resilience, risk assessment and screening criteria. There is a need for greater market experience with the quantification and monetisation of climate resilience outcomes, given the dynamic, iterative, and context-specific nature of climate resilience target. Other barriers to investment in climate adaptation and resilience include the lack of awareness of climate resilience benefits, the lack of capacity and clarity among government and private sector, and the cross dependency of risks, impacts and benefits across sectors and stakeholders (CBI 2019).



Photos: Cityadapt ES

Taxonomies have focussed on solutions for both adapted activities and those that enable other activities to adapt. The rationale of the eligibility criteria is to ensure the following:

- Mitigation of all the physical risks that might occur due to climate change for the activity itself
- Mitigation all the physical risks of other activities that might occur due to climate change
- That the interventions do not affect other adaptation efforts

The metrics for determining the eligibility of adaptation activities across the sectors have involved the following options:

- **Option-1:**
Vulnerability assessments
- **Option-2:**
Using national or regional adaptation plans



Option-1: Vulnerability assessments

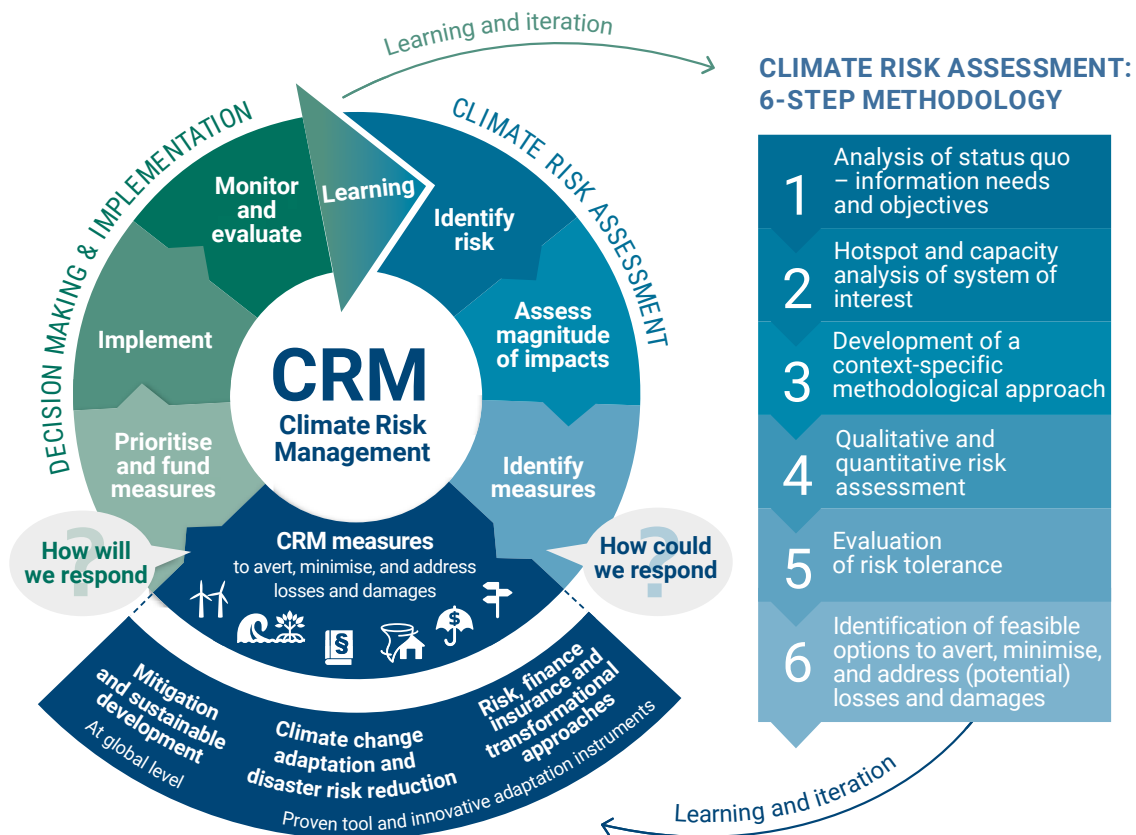
This approach involves conducting detailed assessments to identify context-specific climate risks to the activities to identify the vulnerability of assets and activities and to implement mitigation measures.

Climate Risk Assessment

Though the IPCC report has assessed and estimated risks at the LAC regional level, there is an urgent need for integrated management of climate related risks at all levels. Thus it is pivotal to develop locally appropriate, effective and practicable Climate Risk Management (CRM) frameworks to foster resilience. This is possible through Climate Risk Assessment (CRA) that support decision marker for climate change adaptation planning by assessing risks, magnitude of impacts on stakeholders, assets, value chains and ecosystems; and identify suitable solutions. The GIZ Global Programme on Risk Assessment and Management for Adaptation to Climate Change (Loss and Damage) (GP L&D) in collaboration with International Institute for Applied Systems Analysis (IIASA) and other partners, has developed a 6 step-methodology for CRA that particularly focuses on averting, minimising, and addressing losses and damages as shown below:



Figure 22: GIZ's CRM framework and the 6-step CRA methodology as a main component



(GIZ 2021)

The GP L&D's CRM framework can be leveraged to define climate change risks and vulnerabilities at the local and national level, as it caters to not only decision makers at local and national government levels but also private and public sector. The CRM framework is also comprised of interlinking elements and is flexible by design, which allows for the modification and revision of decisions over time based on new evidence or data on local conditions. The interlinking elements are as follows: 6-step Climate risk assessment; identification of CRM measure to avert, minimise and address losses and damages; decision making and implementation; and learning and iteration.

The aim is to support decision makers at all government and community levels to identify responses and strategies, particularly for actions that go beyond conventional adaptation and are well-suited for the local context. The framework thus looks to promote dialogue among different stakeholders such as governments, communities, women's groups, private sector, among others via participatory methods.

Information required to choose the option:

Since adaptation measures are site specific, it important to consider the following parameters for such assessments⁵²:

- Location specific assessments
- Use of appropriate data and robust climate models (e.g., Global Climate Model - GCM)
- Establishing indicators and parameters that can be monitored
- Identification of physical risks and their potential impacts
- Assessments considering long-term effects (e.g., >10 years or at least the life time of the activity)
- Assessing the acute and chronic hazards, exposure, and vulnerability
- Identification of measures for mitigation with prioritising green infrastructure and nature-based solutions

Advantages

- Site specific and detailed assessments of all potential hazards ensuring context-specific solutions
- Analysis based on scientific-data and methodologies
- Long-term effects considered for the mitigation of risks

Disadvantages:

- Definitions of vulnerability assessments are not harmonised globally and can lead to misinterpretations or different outcomes (e.g., economic damage, loss of human lives, damage to materials and activities)
- Can increase costs of verification for projects
- Lack of reliable data might be a challenge
- Needs monitoring in long-term
- Needs sufficient technical capacity to develop climate models and conduct such assessments

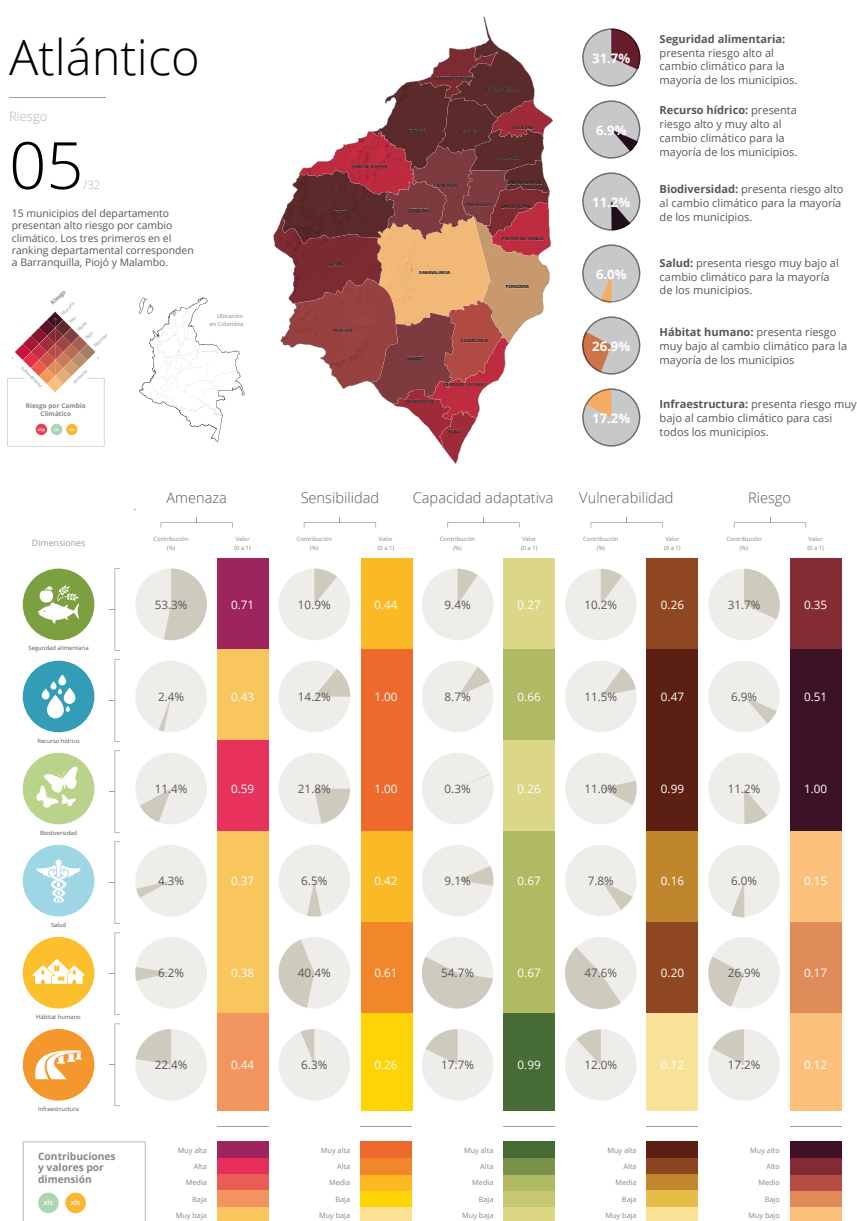
52. The Climate Resilience Principles developed by Climate Bonds Initiative, Climate Resilience Consulting and World Resources Institute provide a detailed framework for evaluating adaptation activities and conducting vulnerability assessments.



Option-2: Using national or regional adaptation plans

This approach involves using the available national or regional adaptation plans as a reference for determining the eligibility of adaptation activities. These plans are usually developed by the governments to identify potential climate change risks in different locations considering various parameters of evaluation. This approach removes the need for individual assessments and hence could be beneficial, especially for small users who might not have technical capacity or resources to conduct detailed vulnerability assessments. An example of a climate risk map for different municipalities in the state of Atlántico, Colombia is shown below:

Figure 23: Example of a climate risk map



(IDEAM, UNDP 2016)

Information required to choose the option:

- Availability of detailed national or regional plans
- Assessment of hazards, exposure, and vulnerability of different climate events on all locations in the country or region
- Long-term analysis and potential impacts on different sectors

Advantages:

- No need for additional assessments for adaptation projects as the plans are often developed based on extensive climate assessments through modelling by national authorities
- Easy to implement and verify
- Saves costs and time for such evaluations
- The approach is beneficial for small users who might not have technical capacity or resources to conduct such assessments and are often the most vulnerable to climate change

Disadvantages:

- Necessary to have a detailed scientific vulnerability assessment for climate change and adaptation plans for all localities under consideration
- The assessments might not have granular results as they are carried out on a macro scale
- Possibility of high errors in modelling due to lack of granularity

**Considerations to avoid harm to other objectives**

Adaptation related activities can cause adverse impacts on the environment which need to be considered. Examples of such impacts are:

- Construction of dikes in coastal areas affecting sensitive ecosystems
- Construction of reservoirs for storing water but affecting the flow of water
- Construction of stormwater drain to mitigate to increase the carrying capacities, but the designs are inconsistent with the surface hydrology and topology resulting in flooding in other areas (creating other vulnerabilities)
- Buildings that are adapted to sea-level rise but constructed in biodiverse areas
- Improving agricultural supply chain resilience for manufacturing while cause harm to food security
- Improving soil water holding capacity in farms using compost but excessive application resulting in the leaching of nutrients to groundwater aquifers
- Construction of buildings which are resistant to severe storms, but using materials which are not recyclable or are hazardous

3. Summary

Taxonomies are technical documents that are based on scientific definitions to guide the market on defining green or sustainable investments and prevent greenwashing. Taxonomies act as tools for transition and help decarbonise the economy. Taxonomies are being developed at a rapid pace globally and in LAC. To ensure that they are interoperable and follow the same guiding principles, there is a need for establishing a common framework.

This LAC Taxonomy Common Framework provides guidance for taxonomies in the region. The report is focussed on the objectives of climate change mitigation and climate change adaptation. It additionally provides guidance for inclusion of activities, as well as guidelines for the definition of metrics and thresholds for certain sectors of the taxonomy. The LAC Taxonomy Common Framework also provides guidance and considerations for requirements for other environmental objectives and minimum social safeguards, but the substantial contribution to other environmental and social objectives are expected to be developed in future and is not part of the current report. Sufficient guidance for the development of other objectives are not yet available in other taxonomies and development of these objectives are essential for overall sustainable development.

The LAC Taxonomy Common Framework provides guidance for the key elements of taxonomies: objectives, sectors and activities, metrics and thresholds and establishes the design principles.

Guiding Principles

The LAC Taxonomy Common Framework establishes the following six Guiding Principles (GP) for taxonomies in the region:



GP-1: Seek interoperability with other taxonomies



GP-2: Make material positive contribution to well-defined objectives and avoid damage



GP-3: Provide clear definitions that science-based for environment or evidence-based for other sustainability issues



GP-4: Allow for credible transition of high emission sectors with a clearly defined final goal, regardless of the pathway



GP-5: Be dynamic and subject to regular reviews



GP-6: Ensure good governance, transparency, and practical applicability



Sectors and activities

Sustainable Finance Taxonomies must cover all sectors and activities that needs to be decarbonised or are prone to the effects of climate change. Since these are dynamic documents, the development can also be done in a phased manner. To prioritise sectors at a regional level based on the climate objectives, an assessment was carried out to identify the key sectors that could be included in taxonomies in the region.

The LAC Taxonomy Common Framework also provides guidance on inclusion of activities in taxonomies. The recommended rules for inclusion of economic activities under respective sectors in a taxonomy are:

- Activities that substantially contribute towards the taxonomy objectives
- Activities that enable other activities in the same or other sectors to meet the taxonomy objectives
- Activities that need to undergo transition to eventually meet the taxonomy ambition over a defined period of time
- Activities that do not have a significant contribution but have a low or minimum contribution to the taxonomy objectives and do not cause harm



Metrics

The LAC Taxonomy Common Framework provides guidelines for choosing metrics to establish thresholds for certain sectors and activities of the taxonomy. This acts as a menu of options for the Technical Expert Groups discussions during taxonomy development. The options can be adopted for defining screening criteria for activities based on the information required and after the evaluation of pros and cons. These options have been developed based on review of various approaches used in taxonomies globally. Taxonomies can also potentially use approaches for metrics which are not listed in the LAC Taxonomy Common Framework, but in such cases, it is important to ensure compliance with the guiding principles. The report also provides guidance on DNSH for other environmental objectives and considerations for adaptation for the sectors.

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Annex A: Taxonomy development

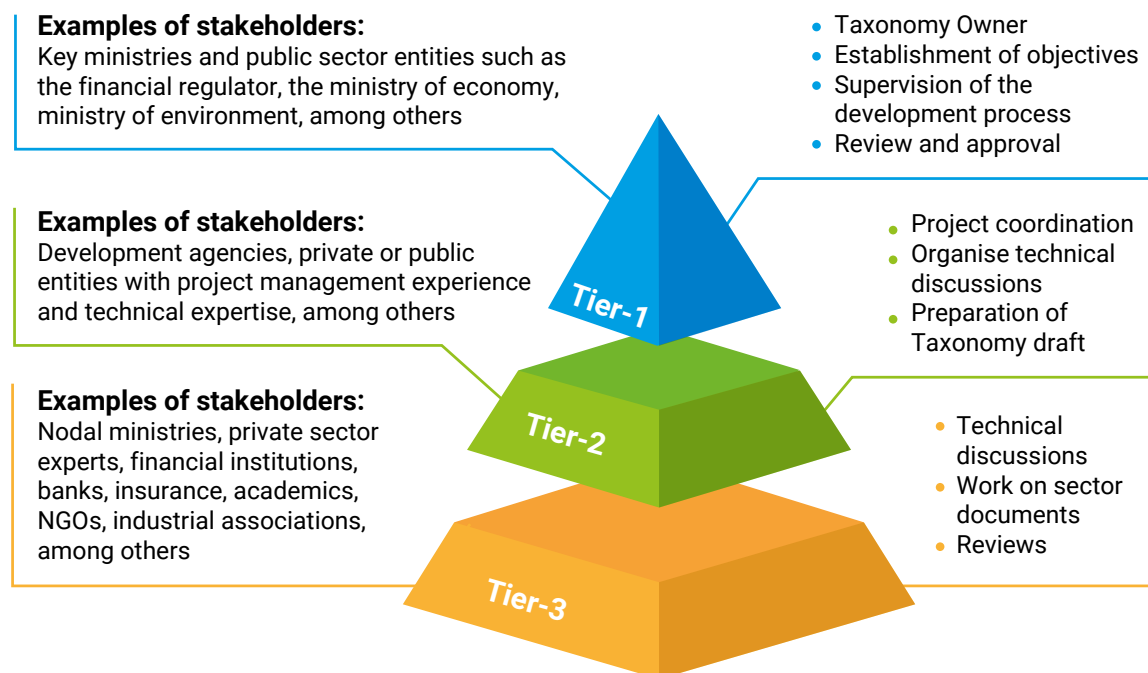
Based on the assessment of governance models and development processes of taxonomies globally, an ideal governance structures and development process is described below. The actual governance models and development process could vary for every taxonomy depending on the scope, resources, timeframe, political structures, coordination mechanisms, among others.

Governance

The taxonomy development is a multi-stakeholder approach and involves multiple stakeholders from both government and non-government entities. It includes stakeholders from the public sector entities (e.g., ministries, regulators, policymakers), private sector (e.g., banks, companies, project developers), academia, NGOs, among others. Developing a taxonomy considering such a wide variety of stakeholders with different roles and interests requires efficient coordination. Such a consultive process will also ensure a wider acceptance by the market participants.

Based on the assessment of governance models of several taxonomies, a recommendation for a governance model that can be used for taxonomy development is shown below:

Figure 24: Governance structure for taxonomy development



(IDB, CBI 2021)

Tier-1

This is the supervisory group responsible for the taxonomy development and implementation. They are the key decision makers and owners of the taxonomy development process and are responsible for several important tasks such as:

- Establishing the scope and regulatory framework
- Development of the framework of the taxonomy and definition of the key elements
- Selection of the objectives of the taxonomy
- Supervision of the technical groups and coordinators of the project
- Stakeholder engagement
- Decision making
- Review and approval of technical documents
- Implementation of the taxonomy including dissemination and capacity building
- Periodic revisions, etc.

This group or committee could include various key ministries and public sector entities such as the financial regulator, the ministry of economy, ministry of environment, etc. depending on the governance structures of each country. Having a small number of stakeholders in this committee will ensure ease of decision-making. The nodal ministries (e.g., ministry of energy, transport, etc.), private sector participants, financial institutions, NGOs, academia, etc. could be involved in the technical committees (Tier-3) depending on their area of expertise. The role of central banks, financial regulators and other technical ministries are explained further in the chapter.

Tier-2

These are the project managers who are responsible for coordination of the taxonomy development process and implementation of the guidelines established by the Tier-1 committee. The project coordinators are responsible for tasks such as:

- Conducting technical assessments, gap assessment and other research
- Development of supplementary guidelines
- Developing the technical framework based on the objectives
- Assessment and selection of sectors and activities⁵⁴
- Establishing Technical Expert Groups for each sector of the taxonomy
- Organising the technical sessions and establishing science-based metrics and thresholds for activities across the taxonomy sectors with the involvement of experts

54. The sectors and activities can be developed in a phased manner or simultaneously depending on the resources and time available. The prioritisation of sectors also provides and insight into the sectors that must be developed first in the taxonomy. It is however important to ensure that the taxonomy adheres with the guiding principles and includes the structural elements as defined in this common framework.

- Compiling the technical work and presenting it to the Tier-1 committee for review and approval
- Organising public consultation processes
- Finalising the taxonomy documents for publishing.
- Support with capacity building or implementation of the taxonomy

Apart from technical coordination and project management, the Tier 2 committee is responsible for admin and documentation work of the taxonomy and constantly coordinate between the Tier-1 and Tier-3 groups. Examples of actors include development agencies, private or public entities with project management experience and technical expertise, especially related to the development of taxonomies.

Tier-3

This is the technical expert group that consists of experts from various public and non-public sectors who will participate in the technical discussions related to the establishment of metrics and thresholds for activities across the sectors. The group will be involved in tasks related to:

- Review and development of technical documents
- Review of sectors and activities
- Establishing screening criteria
- definitions that are based on science
- Provide feedback on technical criteria, pathways, and trajectories for decarbonisation, etc.

This group can involve stakeholders such as the nodal ministries (e.g., ministries of water resources, transport, energy, etc.), experts from private sector, financial institutions, banks, insurance companies, academics, NGOs, industrial associations, among others.

Role of Financial Regulators

Although taxonomies are technical documents, the principal users are the financial sector participants who are regulated by the financial regulators. They aim not only to promote a deep transformation of the country's productive system towards a low-carbon and resilient economy, but also to address the risks that climate change will have directly on financial industries and their stability⁵⁵.

In most of the taxonomies developed or under development globally, the regulatory entities that supervise the proper functioning of financial systems have played an important role in the governance systems (Tier-1) for the development of sustainable finance taxonomies.

55. During the One Planet summit in 2017, several financial regulatory and supervisory entities, including central banks, established the Network of Central Banks and Supervisors for Greening the Financial System (NGFS), which constitutes a global framework that will strengthen the role of the financial system in greening the economy of the regions and which directly specifies the need to "support the development of a green taxonomy of economic activities" and "have a public and accessible, globally harmonized tool to ensure a level playing field and avoid dilution of green labelling".

The key tasks of the financial regulator in the development and implementation of taxonomies are:

- Participation in defining the scope, governance, and design of the taxonomy as they are the main implementing entity
- Provide guidance on application to the market (e.g., development of regulatory framework)
- Participate and lead the key decisions of the development process along with other members of the Tier-1 governance committee
- Review and approve the technical assessments
- Help establish the Technical Expert Groups (TEG) and involve key stakeholders from the financial sector
- Review and approve taxonomy documents
- Organise public consultation process and approval final documents
- Publish the taxonomy documents and related tools along with other members of the Tier-1 governance committee
- Disseminate the taxonomy and conduct capacity building sessions for all relevant stakeholders in the market
- Implement taxonomy pilots to test its usability for different users and instruments (particularly the green labelled products) to understand the challenges for its implementation
- Coordinate the development of tools that allow the uptake of the taxonomy in a quick and easy way by the financial institutions, (e.g., development of a webtool that facilitates navigation)
- Development of implementation and verification guidelines
- Monitoring and tracking the progress through surveys or other mechanisms

Role of Technical Ministries

Since taxonomies are technical documents, the role of technical and nodal ministries is vital to ensure that they adhere to the guiding principles and align with the national and international goals and commitments of the countries and regions.

The key technical ministries such as the Ministry of Environment or Climate Change must also be involved in the decision-making processes of the taxonomy development (e.g., Tier-1 committee) and other nodal ministries such as the ministries of economy or finance, energy, transport, water resources, agriculture, etc. could be involved in the respective sectoral discussions to prepare the technical documents.

These are some of the tasks where the key technical entity such as the Ministry of Environment or Climate Change must be involved in the taxonomy development and implementation process:

- Selection of taxonomy objectives
- Defining the national plans, strategies and international commitments that must be considered (e.g., Paris Agreement, long-term climate strategies)
- Selection and prioritisation of sectors
- Conducting technical gap assessments and sectoral research
- Providing information on decarbonisation pathways, data, and information relevant for developing metrics and thresholds
- Development of technical documents
- Guidance on standards, environmental licences and regulations that can be incorporated for evaluating criteria, especially the DNSH requirements
- Revision and approval of the technical documents
- Revision comments from public consultation processes and their integration
- Capacity building and training of market participants on the use of taxonomy
- Guidance for verification and implement of the taxonomy
- Periodic revision of the technical documents to update the screening criteria and include additional activities, sectors, and objectives
- Ensuring consistency with existing environmental, climate, social and sectorial laws and policies, whenever adequate
- The nodal ministries such the Ministry of Energy, Transport, Gender etc. should participate in the development of sectoral documents of the taxonomy. Their tasks include:
 - Leading or participating in the respective sectoral discussions to ensure that the metrics and thresholds abide by the guiding principles and prevent lenient criteria or unfair lobbying
 - Guiding technical discussions by providing information related to activities, metrics, and thresholds
 - Providing information about standards and regulations that must be considered
 - Providing information about decarbonisation pathways, availability of technologies and processes and market tendencies
 - Revision of the respective sectoral documents before finalisation
 - Revision comments from public consultation processes related to the respective sectors and guidance on incorporation
 - Capacity building for implementation
 - Developing policies for respective sectors that are aligned with the taxonomy (e.g., policies for green hydrogen)

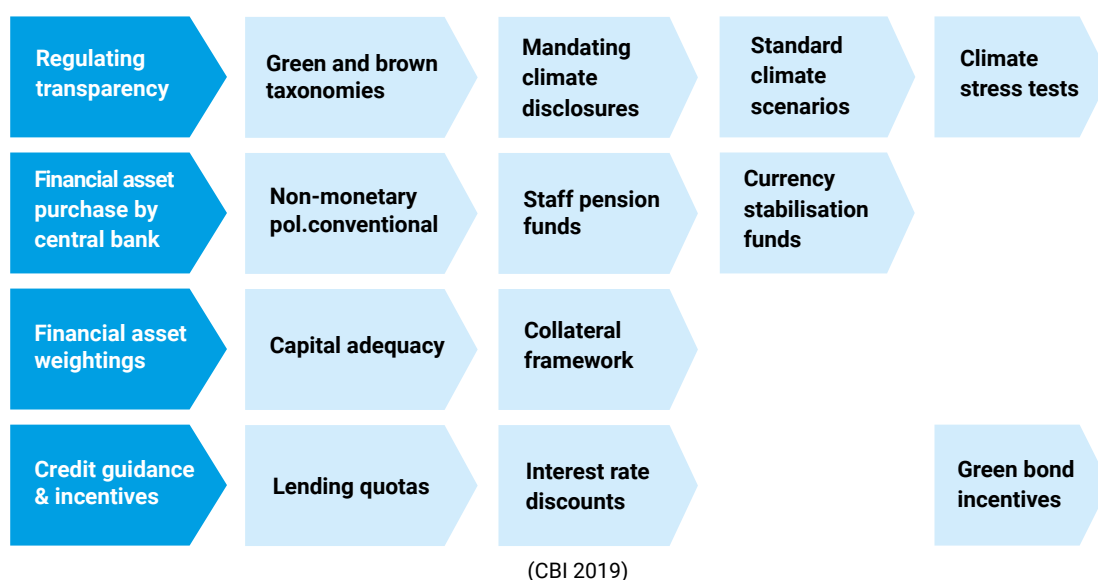
Role of Central Banks

Central Banks have generally played an important role in addressing the immediate challenges of climate change, especially in emerging economies which are more exposed to both physical and financial risks associated with climate crisis. The role of Central banks in Advanced economies and Emerging Market and Developing countries (EMDC) has evolved considerably;

especially after the financial crisis of 2008-09 and the mandates of Central Banks are broadening towards the prevention and management of financial crises by safeguarding financial stability (BIS 2011). An analytical review on the alignment of climate-related financial risk and mitigation policies with 135 central bank mandates from the IMF Central Bank Legislation Database points out that only 12% have mandates that specifically refer to sustainability goals such as the Paris Agreement and SDGs. However, at least 40% of the central banks are required to support government's priorities which can include sustainability goals (Dikau 2020).

Central Banks have access to several instruments which can be used to influence financial markets and guide towards a low-carbon transition as shown below:

Figure 25: Toolkit of policies available for Central Banks



The testament to the progress in EMDCs is the ASEAN Central Bank's Agenda on Sustainable Banking, which was developed jointly by ASEAN central banks and monetary authorities. The agenda proposes seven key recommendations that ASEAN central banks/monetary authorities could consider in driving sustainable central banking practices, in accordance with their respective mandates, with an emphasis on climate and environmental considerations. The recommendations include (ASEAN 2020):

- Demonstrate commitment and policy direction in shaping the sustainable banking ecosystem to foster the adoption of sustainable banking practices
- Take leadership by integrating sustainability practices into central banks and/or monetary authorities' strategies and operations
- Formulate policy action to support the national or regional sustainable growth agenda
- Communication of national or regional common interests and unique circumstances where appropriate, at international platforms
- Develop frameworks to encourage banks to embed sustainability into their business practices

- Promote the establishment of a data collection framework to properly monitor risk exposures and assess the vulnerability of the financial sector to climate and environmental-related risks
- Enhance capacity building and awareness of central banks and/or monetary authorities and banks in relation to sustainable banking

Furthermore, in EMDCs like Mexico, Bangladesh, Brazil, India, China and industrialised countries such as South Korea, Central Banks have played a pivotal role in decarbonising the financial sectors.

Taxonomies serve as a clear guideline for policy makers to update and develop strategies, regulations, policies and incentives since the activities and definitions of eligibility are based on science-based targets and help mitigate the physical and transition risks which translate into financial risks. The NGFS also recommends Central Banks to take an active role in the development of taxonomies to help profile green activities and promote transparency in the market (NGFS 2019). Central Banks have been involved in the process of taxonomy development processes from the beginning in some countries and regions such as China, ASEAN, and Chile.

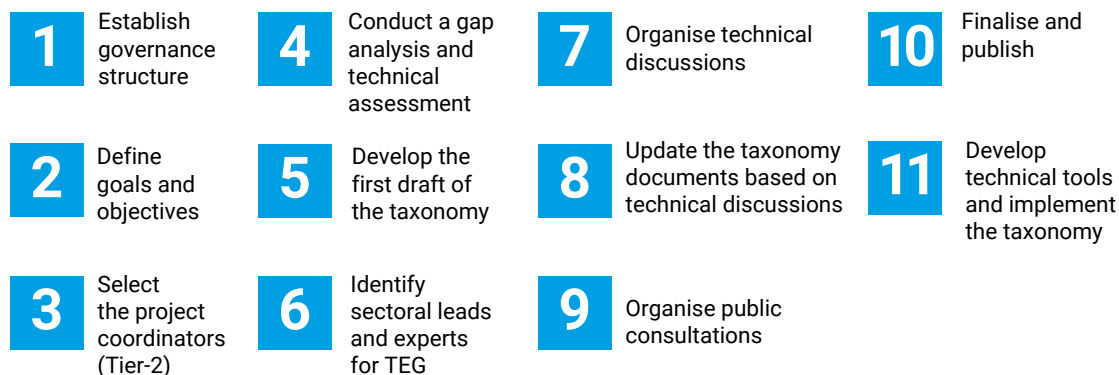
Some of the potential roles of Central Banks in taxonomy development and implementation are listed below:

- Support the development of a taxonomy of economic activities to promote transparency and prevent greenwashing
- Promote disclosures climate-risk and alignment with respect to taxonomies
- Create and development capacity
- Create financial participation strategies to achieve financial inclusion and greening the economy
- Support the development of policies and incentives to align with the taxonomy
- Promote homogenisation of “green” or “sustainable” definitions for economic activities
- Promote capital flows for sustainable investments

In countries where there are no central banks (e.g., Panama), these roles could be led by other relevant entities such as the regulator, Sustainability Commissions, banking associations, among others.

Taxonomy development process

Based on the governance model suggested above, steps that should be considered for development of taxonomies are shown below and explained further (CBI 2021). These recommendations could potentially vary for every process which depends on several aspects such as governance models, availability of time and resources, advances with taxonomy development, availability of data and information, among others:

Figure 26: Taxonomy development process

- 1.** Adapted from (CBI 2021)The first step is to establish the overall governance structure, especially the selection of the tier-1 committee members who will plan and organise the taxonomy development process.
- 2.** Define goals and objectives: The tier-1 committee should establish the climate, environmental or social goals and objectives of the taxonomy based on national, regional and international commitments of the country or region. The design of the taxonomy will be focussed on meeting the defined objectives. This is a critical step in the process and the framework and methodology should be defined before moving forward with sector selection and screening criteria development.
- 3.** Select the project coordinators: The tier-1 committee should select the project coordinators (tier-2) who will be involved in the project coordination and execution. Organisations (public, private, multilateral or development banks) with technical and project management expertise related to taxonomy development could be chosen for this role. This role is critical for the development {process and the entity selected will be in-charge of coordination with the tier-1 group, helps organise and conduct technical and industry discussions, engage multiple stakeholders, organise public consultations and prepare the taxonomy documents for approval and publishing.
- 4.** Gap analysis: The project coordinators with the help of technical experts should conduct a gap analysis which will involve the review of national, regional policies, goals, international commitments, and comparison with global and regional taxonomies. This analysis along with sector prioritisation exercise will result in the first list of sectors and activities that should be considered in the taxonomy. It will also help identify reference taxonomies and frameworks that could be used during the development of the technical documents.
- 5.** Based on the technical gap assessment and the defined objectives, the project coordinators should develop the initial draft of the taxonomy. The draft should include the list of activities and their screening criteria, at least for the fast-track activities⁵⁶.

56. Activities for which the screening criteria can be easily adopted or adapted from a taxonomy of reference. The screening criteria for such activities often have global consensus and might not need contextualisation (E.g., electricity generation from solar PV).

6. **Lead advisors and sectoral experts:** Lead advisors or Chairs should be chosen for each of the sectors based on the recommendations from tier-2 and tier-1 committees. Additionally, technical and industry experts must be identified for all the sectors who will be involved in focused technical discussions. This group of technical and industry experts shall constitute the Technical Expert Group (TEG) who will help develop the technical documents of the taxonomy.
7. **Technical discussions:** The Lead advisors should review the first draft of the taxonomy document prepared by the project coordinators and provide feedback and revise the document. This will help in reducing the time for revision with technical experts (tier-3) and make the process more efficient. This document should be subjected to technical discussions with sectoral and national experts engaged through the respective sector sub-committees (tier-3) who will provide feedback and develop screening criteria for all the activities. The Lead advisors must ensure that the technical criteria comply with the guiding principles of the taxonomy framework.

These are some of the key considerations for the technical discussions:

- The initial draft of technical documents should be prepared by the Tier-2 committee which should be led by an organisation with technical and project management expertise required for such a task.
 - Review of technical draft by the sectoral leads/chairs prior to initiating the technical discussions. This will ensure that the documents that are subjected to TEG discussions have been reviewed and contextualised to suit the national or regional contexts.
 - Ensure that in the technical discussions, all modifications to the screening criteria are based on scientific information and not constrained by existing policies or regulations. The technical documents must also comply with the guiding principles of the LAC framework.
 - The minutes of the technical discussions must be recorded, and the technical and industry experts must be able to work on the documents simultaneously outside the meeting sessions (e.g., documents on a shared cloud folder).
 - Set a time limit (e.g., 2-3 weeks) for feedback on the sectoral documents.
 - Sector leads or Chairs should filter out non-relevant comments (e.g., unscientific arguments for thresholds) and integrate the changes.
8. **Revised draft of the taxonomy:** After the technical discussions, the lead advisor chairs together with the project coordinators should incorporate the relevant comments and prepare a revised draft of the taxonomy. This must be reviewed by the tier-1 committee. The feedback and comments should be reviewed and incorporated by the project coordinators.
 9. **Public consultations:** The taxonomy document should be subjected to a well-structured public consultation process in a defined timeframe (e.g., 3-4 weeks) to receive feedback and comments from a wider stakeholder group. This will ensure that comments and feedback from all relevant stakeholders will be considered before the documents are published for use.

These are some key considerations for the public consultation process (CBI, IDB 2021):

- Ensure that the taxonomy draft has been reviewed by key stakeholders and has approvals from the TEG and the Tier-1 committees prior to the public consultation process.
 - Publish a FAQ or a guidance document for users which explains the taxonomy design, key elements, rationale behind the components and definitions in the document.
 - Set a time limit for the public consultation process (e.g., 3-4 weeks).
 - Communicate and publish the draft for public consultations on a website with clear instructions on receiving the feedback (e.g., email ids, formats for comments).
 - Consolidate the comments and review them with the sectoral leads and project coordinators incorporate any changes. The changes must be reviewed by Tier-1 committee before publishing for public consultation.
- 10.** Final review and publishing: The comments from the public consultation process should be reviewed and integrated to the technical documents. The changes must be presented to the Tier-1 committee to obtain approval before finalising the document.
- 11.** Implementation: once the documents are finalised for publishing, web or excel tools must be developed for the technical annexes. This will be beneficial for users to refer to the taxonomy.

A comparison exercise to estimate the alignment, identify similarities and differences of the taxonomy with other key taxonomies of reference should be done. This will provide a greater clarity for international investors.

The implementation should also include a robust communication strategy to explain the purpose of the taxonomy, benefits for different user groups, aided by practical guidelines, among others.

Taxonomy implementation

After the taxonomy is developed, steps must be taken to ensure its adequate implementation and uptake by the market participants. This will include several tasks such as:

- Developing regulations, guidance, circulars, and policies to provide a clear legal structure for the taxonomy (e.g., guidance for disclosures, voluntary vs mandatory use for different financial instruments and actors)
- Capacity building of key participants (e.g., banks, insurance companies, pension funds, companies, etc.)
- Developing taxonomy pilots: implementation of taxonomy for different users (banks, microfinance institutions, etc.) and for different instruments (e.g., green credits) and identifying the gaps in the market to successfully implement taxonomies.
- Using feedback from market participants and results of the pilots to update the taxonomy.
- Monitoring and tracking of taxonomy-aligned finance flows

Box. 4 Colombian Taxonomy Pilots

The first taxonomy implementation pilots for green credit lines in commercial and Tier-2 banks indicated that the application of the taxonomy is challenging for most micro, small and medium enterprises (SMEs) (Ambire Global, Metrix Finanzas 2022). SMEs constitute a significant part of the business fabric in Colombia and in LAC. This was mainly due to limited resources and capacities, lack of information and data that is necessary to demonstrate compliance with the taxonomy. Taxonomies should therefore consider practical applicability to different types of users in the market (Guiding Principle 6 of this Framework) and recognise that not all users are at the same level to respond to the implementation of a taxonomy.

Based on the gaps identified during the pilots, it was concluded that considering the type of user (size, type of debtor, category) and the scale of the project/activity to be financed, the users could be classified into small, medium, and large and the requirements of the taxonomy could potentially be applied differently. For example, the application of eligibility criteria, general and activity specific DNSH requirements established in the taxonomy could be applied differently for the user types such as:

- Small users: Mandatory (eligibility criteria) + best practice/optional (general and specific requirements of DNSH).
- Medium users: Mandatory (eligibility criteria + specific requirements of DNSH) + best practice/optional (general requirements of DNSH)
- Large users: Mandatory to comply with all requirements (eligibility criteria + specific requirements + general requirements of DNSH)

Finally, taxonomies are dynamic documents and will continuously involve changes such as addition of new sectors and activities, revision of screening criteria and expanding to other objectives. The Tier-1 committee must regularly review such tasks.

Potential Uses

Taxonomies can have multiple uses to different market participants and can serve as an important policy to achieve sustainability goals (BIS 2021). While the most common use has been for the issuance of thematic bonds and disclosures, the potential actors and uses of a taxonomy are identified below (World Bank Group 2020)

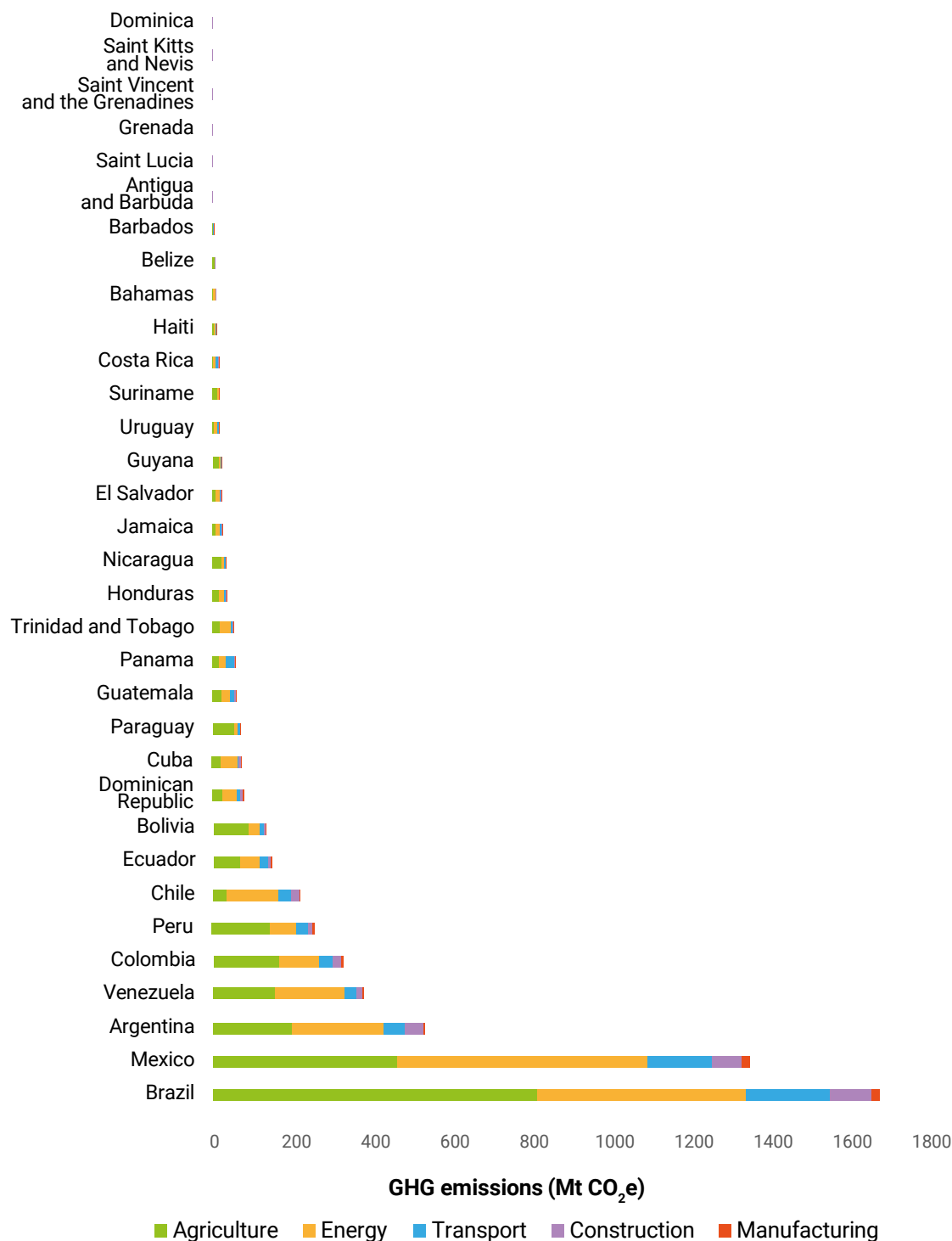
Figure 27: Users of a taxonomy

Main actors	Potential uses
Banks and financial institutions	<ul style="list-style-type: none"> • Originate and structure green banking products (such as loans, credits, and guarantees) more easily and consistently • Boost efficiency of green lending and funding operations • Lower transaction costs through faster identification and verification of eligible assets • Reduce uncertainty and reputational risk • Understand and disclose exposure to sustainable investments as required by regulators
Financial regulators	<p>Help with the greening of the financial sector by:</p> <ul style="list-style-type: none"> • Supporting regulatory interventions based on the taxonomy to encourage banks to lend to eligible green companies • Facilitating new climate- or sustainability-related reporting and disclosure guidelines for financial market actors or enhancing existing ones • Measuring financial flows toward sustainable development priorities at the asset, portfolio, institutional, and national levels • Avoiding reputational risk by preventing “green-washing”
Investors	<ul style="list-style-type: none"> • Identify opportunities that comply with sustainability criteria for high-impact investments • Disclose exposure to sustainable investments, as required by regulators • Understand the exposure of portfolios to green investments and design investment policies aligned with the preferences of clients and beneficiaries • Support investor engagement with investees with regard to business models and transition plans
Green/ sustainability bond issuers and other relevant actors, such as certifiers and verifiers	<p>Identify eligible activities that can be financed more easily and consistently with relevant thematic bonds</p>
Policy makers	<ul style="list-style-type: none"> • Identify areas of underinvestment and bridge the funding gap • Facilitate the development of a pipeline of green projects in accordance with national priorities for environmentally sustainable development • Provide a reference for policymakers as they develop strategies to achieve national sustainable development commitments, such as those in the country’s Nationally Determined Contribution (NDC) targets and Sustainable Development Goal (SDG) agendas, and improve associated systems for tracking and measuring finance flows
Others	<p>Provide a consistent starting point for standard setters and product developers</p>

(World Bank Group 2020)

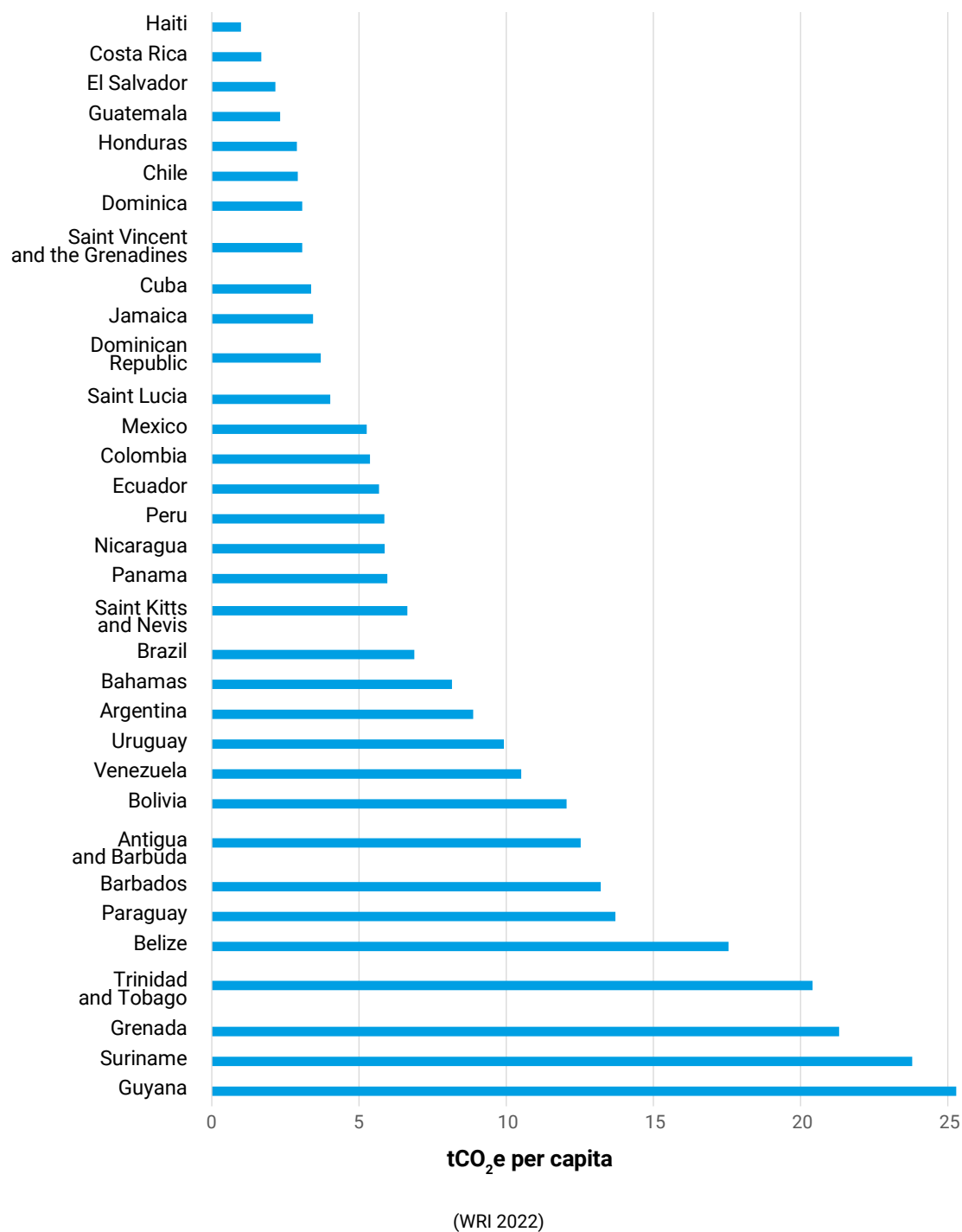
Annex B: GHG emissions of LAC countries

Figure 28: GHG emissions of LAC countries



(WRI 2022)

Figure 29. GHG emissions per capita by country (2019)



Annex C: Analytical methods for sector prioritisation

Weighted-average method

Table 10: Results weighted-average method

Indicator		Sectors				
Name	Weight	Agriculture, land-use change and forestry	Construction & Real estate activities	Manufacturing	Transportation and storage	Electricity, gas, steam, and air conditioning supply
GHG Emissions 2019 (Mt CO ₂ eq)	0,7	2.404	339	72	674	2.178
GDP 2019 (Million Dollar)	0,3	247.215	272.960	626.939	375.360	119.521
Total	1	75.847	82.125	188.132	113.080	37.381
Score		4	3	1	2	5

Decision matrix

Table 11: Results decision matrix

Sectors	GHG Emissions 2019	GDP 2019 (current)	Total	Score
Agriculture, land-use change and forestry	3	1	4	1
Construction & Real estate activities	2	1	3	5
Manufacturing	1	3	4	1
Transportation and storage	2	2	4	1
Electricity, gas, steam, and air conditioning supply	3	1	4	1

Table 12: Assigned ranges for decision matrix

Indicator	Low	Medium	High
GHG Emissions 2019 (Mt CO ₂ eq)	0 - 300	300 - 800	> 800
GDP 2019 (Million Dollar)	0 - 300.000	300.000 - 600.000	> 600.000

Table 13: Scores for decision matrix

Criteria	Score
Low	1
Medium	2
High	3

ELECTRE**Table 14: Raw data for ELECTRE**

Raw data for analysis		
Sectors	P-1	P-2
	GHG Emissions	GDP
	Mt CO ₂ eq	MM USD
Agriculture, land-use change and forestry	2403,5	\$ 247.215,39
Construction & Real estate activities	338,6	\$ 272.959,78
Manufacturing	71,8	\$ 626.939,38
Transportation and storage	674,2	\$ 375.360,11
Electricity, gas, steam, and air conditioning supply	2177,5	\$ 119.520,82

(WRI 2022) (ECLAC 2022)

Table 15: Normalisation of parameters

Normalisation of parameters		
	GHG Emissions	GDP
	Mt CO ₂ eq	MM USD
Max Value	2403,5	\$ 626.939,38
Critical Value	0,0	\$ 0
Normalised values		
Agriculture, land-use change and forestry	1,0	0,4
Construction & Real estate activities	0,1	0,4
Manufacturing	0,0	1,0
Transportation and storage	0,3	0,6
Electricity, gas, steam, and air conditioning supply	0,9	0,2

Table 16: Normalised weight values

Normalised weight values		
Sectors	GHG Emissions	GDP
Agriculture, land-use change and forestry	0,700	0,118
Construction & Real estate activities	0,099	0,131
Manufacturing	0,021	0,300
Transportation and storage	0,196	0,180
Electricity, gas, steam, and air conditioning supply	0,634	0,057
Weight	0,70	0,30

Table 17: Concordance matrix

Concordance matrix					
Sectors	Agriculture, land-use change and forestry	Construction & Real estate activities	Manufacturing	Transportation and storage	Electricity, gas, steam, and air conditioning supply
Agriculture, land-use change and forestry		0,7	0,7	0,7	1
Construction & Real estate activities	0		0,7	0	0,3
Manufacturing	0,3	0,30		0,3	0,3
Transportation and storage	0,3	1,00	0,70		0,3
Electricity, gas, steam, and air conditioning supply	0	0,70	0,70	0,70	

Table 18: Discordance matrix

Discordance matrix					
	Agriculture, land-use change and forestry	Construction & Real estate activities	Manufacturing	Transportation and storage	Electricity, gas, steam, and air conditioning supply
Agriculture, land-use change and forestry		0,012	0,182	0,061	0,000
Construction & Real estate activities	0,601		0,169	0,098	0,536
Manufacturing	0,679	0,078		0,175	0,613
Transportation and storage	0,504	0,000	0,120		0,438
Electricity, gas, steam, and air conditioning supply	0,066	0,073	0,243	0,122	

Table 19: Credibility Matrix

Credibility Matrix							
Sectors	Agriculture, land-use change and forestry	Construction & Real estate activities	Manufacturing	Transportation and storage	Electricity, gas, steam, and air conditioning supply	Total	Score
Agriculture, land-use change and forestry		TRUE	TRUE	TRUE	TRUE	5	1
Construction & Real estate activities	FALSE		TRUE	FALSE	FALSE	2	5
Manufacturing	FALSE	TRUE		TRUE	FALSE	3	2
Transportation and storage	FALSE	TRUE	TRUE		FALSE	3	2
Electricity, gas, steam, and air conditioning supply	FALSE	TRUE	FALSE	TRUE		3	2

Annex D: Useful data resources

Table 20: Useful data sources for statistics, indicators, and other relevant data

Data Type	Organisation	Link
GzDP	ECLAC	https://statistics.cepal.org/portal/cepalstat/dashboard.html?theme=2&lang=es
Economic Activity Classification	ISIC	https://unstats.un.org/unsd/classifications/Econ/Download/In%20Text/ISIC_Rev_4_publication_English.pdf
	ICE	https://siccode.com/
	CAIT	https://www.climatewatchdata.org/ghg-emissions
GHG emissions	CAIT-US AID	https://www.climatelinks.org/sites/default/files/asset/document/GHG%20Emissions%20Fact%20Sheet_User%20Guide%20%20Glossary_September%202016.pdf
	IGES	IGES GHG Emissions Database IGES List of Grid Emission Factors
Agriculture	CIAT	https://ciat.cgiar.org/publications/open-access-at-ciat/
Energy	IEA	https://www.iea.org/
Transport	SLOCAT	Transport Greenhouse Gas Emissions Databases and Supporting Analyses - SLOCAT
Rainfall	IIF	LatAm Dataset (inpe.br)
	The Climate Action Tracker	Countries Climate Action Tracker
	Transition Pathway Initiative	https://www.transitionpathwayinitiative.org/
	SBTI	https://sciencebasedtargets.org/
	New Climate Institute	Home Climate Policy Database
	IPCC	MDX Browser > Search (ipcc-data.org)
Climate Change and Action	Copernicus Climate Data Store	https://cds.climate.copernicus.eu/cdsapp#!/home
	Notre Dame -Global Adaptation Index	https://gain.nd.edu/our-work/country-index/rankings/
	IGES	IGES NDC Database
		IGES Joint Crediting Mechanism (JCM) Database
		IGES Kyoto Units Transfer Database
		IGES CDM Investment Analysis Database
IGES CDM Monitoring and Issuance Database		
IGES CDM Project Database		
Chile Energy sector	National Energy Commission	http://energiaabierta.cl/

Data Type	Organisation	Link
Environmental Law	IUCN, FAO, UNEP	ECOLEX The gateway to environmental law
Public Debt	IDB	Standardized Public Debt Database IADB
Soil	FAO	Regional and National Soil Maps and Databases FAO SOILS PORTAL Food and Agriculture Organization of the United Nations
	UNCTAD	UNCTADstat - About
Economic Data	World Bank	World Bank Open Data Data
	IMF	World Economic Outlook Database, April 2022 (imf.org)
	Center for Open Data Enterprise	https://opendataimpactmap.org/lac
	OECD	Data - Organisation for Economic Co-operation and Development (oecd.org)
LAC Data	UN ECLAC	About Environmental Statistics - Environmental and Climate Change Statistics for Latin America and the Caribbean - Biblioguias en Biblioteca ECLAC, United Nations (cepal.org)
	UN	UNData app
	World Wide Web Foundation	Latin America Open Data Barometer
	UNFCCC	ClimateFinance Home (unfccc.int)
Climate Finance	Climate Funds Update	Data Dashboard - Climate Funds Update
	OECD	Climate Fund Inventory: report and database - OECD
	ADB	Climate Change Financing at ADB ADB Data Library Asian Development Bank
	Climate Policy Initiative	Climate Finance Tracking - CPI (climatepolicyinitiative.org)

Annex E: ND-GAIN Country Index analysis



Great need for investment and innovations to improve readiness and a great urgency for action



It is on the road to responding effectively to climate change, but the adaptation needs and urgency to act are greater



Current vulnerabilities are manageable but improvements in readiness will help it better adapt to future challenges



Adaptation challenges still exist, but is well positioned to adapt

*Social, economic and governance factors also influence a country's position in the world rankings, for more information visit: <https://gain.nd.edu/our-work/country-index/rankings/>

Table 21: ND-GAIN Country Index Analysis

Name	General Score 2020	ND-GAIN Country Index rank	Income group	Vulnerability score	Readiness score	Vulnerability score	Readiness score	General remarks	Most vulnerable thematic areas	critical readiness points
Haiti	35	168	low	0,531400736	0,231958825	high vulnerability score	low readiness score	It has both a great need for investment and innovations to improve readiness and a great urgency for action.	Food (Agriculture capacity), Water (Dam capacity), health (medical staff)	Governance (Control of corruption), Social readiness (Innovation)

Venezuela	40	138	upper middle	0,389147765	0,190085208	low vulnerability score	low readiness score	Relative to other countries, its current vulnerabilities are manageable but improvements in readiness will help it better adapt to future challenges	Food (Projected change of cereal yields), health (medical staff), Human Habitat (Urban concentration)	Governance (Control of corruption and Rule of law), Social readiness (Innovation)
Honduras	40	136	lower middle	0,462281443	0,267311065	high vulnerability score	low readiness score	It has both a great need for investment and innovations to improve readiness and a great urgency for action.	Food (Projected change of cereal yields), Health (medical staff), Ecosystem Services (Natural capital dependency)	Social readiness (Education and Innovation)
Nicaragua	41	132	lower middle	0,446047927	0,27192623	high vulnerability score	low readiness score	It has both a great need for investment and innovations to improve readiness and a great urgency for action.	Food (Projected change of cereal yields and Agriculture capacity), health (medical staff)	Governance (Control of corruption), Social readiness (Education and Innovation)

Bolivia	41	129	lower middle	0,459757626	0,286764268	high vulnerability score	low readiness score	It has both a great need for investment and innovations to improve readiness and a great urgency for action.	Food (Projected change of cereal yields and Agriculture capacity), Water (Dam capacity)	Social readiness (Social inequality and Innovation)
Guyana	43	121	upper middle	0,459289153	0,312166775	high vulnerability score	low readiness score	It has both a great need for investment and innovations to improve readiness and a great urgency for action.	Food (Projected change of cereal yields), health (medical staff), Human Habitat (Paved roads)	Social readiness (Education and Innovation)
Guatemala	43	119	lower middle	0,447415738	0,315931525	high vulnerability score	low readiness score	It has both a great need for investment and innovations to improve readiness and a great urgency for action.	Food (Projected change of cereal yields), Water (Dam capacity), health (medical staff)	Governance (Control of corruption), Social readiness (Education and Innovation)
Belize	44	114	lower middle	0,458007014	0,334759599	high vulnerability score	low readiness score	It has both a great need for investment and innovations to improve readiness and a great urgency for action.	Food (Projected change of cereal yields), Water (Dam capacity), health (medical staff)	Social readiness (Education and Innovation)

Ecuador	44	110	lower middle	0,44738474	0,335181309	high vulnerability score	low readiness score	It has both a great need for investment and innovations to improve readiness and a great urgency for action.	Food (Projected change of cereal yields), Water (Dam capacity), health (medical staff)	Governance (Control of corruption), Social readiness (Innovation)
El Salvador	45	107	lower middle	0,44400822	0,346666808	high vulnerability score	low readiness score	It has both a great need for investment and innovations to improve readiness and a great urgency for action.	Food (Projected change of cereal yields and Agriculture capacity), Ecosystem Services (Projected change of marine biodiversity)	Social readiness (Education and Innovation)
Cuba	46	105	NA	0,435315318	0,349753676	low vulnerability score	low readiness score	Relative to other countries, its current vulnerabilities are manageable but improvements in readiness will help it better adapt to future challenges	Food (Projected change of cereal yields and Agriculture capacity), Water (Dam capacity)	Governance (Regulatory quality), Social readiness (Innovation)

Suriname	46	102	upper middle	0,406363004	0,331987401	low vulnerability score	low readiness score	Relative to other countries, its current vulnerabilities are manageable but improvements in readiness will help it better adapt to future challenges	Food (Projected change of cereal yields), health (medical staff), Ecosystem Services (Engagement in international environmental conventions)	Economic (Doing business), Social readiness (Social inequality and Education)
Dominican Republic	46	101	upper middle	0,426534384	0,355894581	low vulnerability score	low readiness score	Relative to other countries, its current vulnerabilities are manageable but improvements in readiness will help it better adapt to future challenges	Food (Projected change of cereal yields), Water (Dam capacity), Infrastructure (Dependency on imported energy)	Economic (Doing business), Social readiness (Education), Governance (Control of corruption),
Mexico	47	95	upper middle	0,416855031	0,366048159	low vulnerability score	low readiness score	Relative to other countries, its current vulnerabilities are manageable but improvements in readiness will help it better adapt to future challenges	Food (Projected change of cereal yields and Agriculture capacity), health (medical staff)	Governance (Control of corruption), Social readiness (Education and Innovation)

Paraguay	48	93	upper middle	0,402442985	0,363232491	low vulnerability score	low readiness score	Relative to other countries, its current vulnerabilities are manageable but improvements in readiness will help it better adapt to future challenges	Food (Projected change of cereal yields and Agriculture capacity), health (medical staff)	Governance (Control of corruption), Social readiness (Education and Innovation)
Brazil	48	91	upper middle	0,395471621	0,35771469	low vulnerability score	low readiness score	Relative to other countries, its current vulnerabilities are manageable but improvements in readiness will help it better adapt to future challenges	Food (Projected change of cereal yields and Agriculture capacity), Human Habitat (paved roads)	Economic (Doing business), Social readiness (Innovation, Social inequality)
Colombia	48	91	upper middle	0,417235208	0,378494336	low vulnerability score	high readiness score	Adaptation challenges still exist, but Colombia is well positioned to adapt	Food (Projected change of cereal yields), Water (Dam capacity), Ecosystem Services (Projected change of marine biodiversity)	Social readiness (Innovation, Social inequality)

Trinidad and Tobago	48	90	upper middle	0,375851233	0,340518566	low vulnerability score	low readiness score	Relative to other countries, its current vulnerabilities are manageable but improvements in readiness will help it better adapt to future challenges	Food (Projected change of cereal yields), Water (Dam capacity), health (medical staff)	Social readiness (Education and Innovation)
Antigua and Barbuda	48	87	upper middle	0,476997634	0,445502844	high vulnerability score	high readiness score	It is on the road to responding effectively to climate change, but the adaptation needs and urgency to act are greater.	Food (Projected change of cereal yields and Agriculture capacity), Water (Dam capacity)	Social readiness (Education and Innovation)
Bahamas	48	87	upper	0,457091047	0,424584161	high vulnerability score	high readiness score	It is on the road to responding effectively to climate change, but the adaptation needs and urgency to act are greater.	Food (Projected change of cereal yields and Agriculture capacity), health (medical staff)	Social readiness (Education and Innovation)
Peru	49	86	lower middle	0,433897229	0,405183277	low vulnerability score	high readiness score	Adaptation challenges still exist, but Peru is well positioned to adapt	health (medical staff), Human Habitat (Paved roads), Water (Dam capacity)	Governance (Control of corruption), Social readiness (Social inequality and Innovation)

Argentina	49	85	upper middle	0,406644188	0,382984241	low vulnerability score	high readiness score	Adaptation challenges still exist, but Argentina is well positioned to adapt	Food (Projected change of cereal yields and Agriculture capacity), Human Habitat (Urban concentration),	Economic (Doing business), Social readiness (Innovation)
Jamaica	49	84	Lower middle	0,426361919	0,403371202	low vulnerability score	high readiness score	Adaptation challenges still exist, but Jamaica is well positioned to adapt	Food (Projected change of cereal yields), health (medical staff), infrastructure (Dependency on imported energy)	Social readiness (Education and Innovation)
Panama	49	81	upper middle	0,390607444	0,380313392	low vulnerability score	high readiness score	Adaptation challenges still exist, but Panama is well positioned to adapt.	Food (Projected change of cereal yields and Agriculture capacity), infrastructure (Dependency on imported energy)	Social readiness (Social inequality and Innovation)
Dominica	54	62	Lower middle	0,446063064	0,518993729	high vulnerability score	high readiness score	It is on the road to responding effectively to climate change, but the adaptation needs and urgency to act are greater.	Food (Projected change of cereal yields and Agriculture capacity), health (medical staff)	NA

Grenada	54	62	upper middle	0,390286165	0,462066616	low vulnerability	high readiness score	Adaptation challenges still exist, but Grenada is well positioned to adapt.	Food (Projected change of cereal yields), health (medical staff), Ecosystem Services (Engagement in international environmental conventions)	Social readiness (Innovation)
Costa Rica	54	61	upper middle	0,382542503	0,458279173	low vulnerability	high readiness score	Adaptation challenges still exist, but Costa Rica is well positioned to adapt	Food (Projected change of cereal yields), water (Dam capacity), infrastructure (Dependency on imported energy)	Social readiness (Social inequality and Innovation)
Saint Lucia	54	59	lower middle	0,358878153	0,445981459	low vulnerability	high readiness score	Adaptation challenges still exist, but Saint Lucia is well positioned to adapt	Food (Projected change of cereal yields and Agriculture capacity), water (Dam capacity)	Social readiness (Education and Innovation)

Saint Kitts and Nevis	56	53	upper middle	0,455403241	0,566297662	high vulnerability score	high readiness score	It is on the road to responding effectively to climate change, but the adaptation needs and urgency to act are greater	Food (Projected change of cereal yields and Agriculture capacity), health (medical staff)	NA
Uruguay	56	51	upper middle	0,406487228	0,521350585	low vulnerability	high readiness score	Adaptation challenges still exist, but Uruguay is well positioned to adapt	Food (Projected change of cereal yields), Human Habitat (Urban concentration, Paved roads)	Social readiness (Innovation)
Barbados	58	44	upper middle	0,385958559	0,536692412	low vulnerability	high readiness score	Adaptation challenges still exist, but Barbados is well positioned to adapt.	Food (Projected change of cereal yields and rural population), health (medical staff)	NA
Chile	61	30	upper middle	0,324555053	0,542727548	low vulnerability	high readiness score	Adaptation challenges still exist, but Chile is well positioned to adapt.	Water (Dam capacity), Human Habitat (Urban concentration), infrastructure (Dependency on imported energy)	Social readiness (Innovation)

Annex F: List of Taxonomies

Table 22: List of Taxonomies

Taxonomies	Link
EU Taxonomy	https://ec.europa.eu/info/law/sustainable-finance-taxonomy-regulation-eu-2020-852_en
CBI Taxonomy	https://www.climatebonds.net/files/files/CBI_Taxonomy_Jan2021.pdf
China Taxonomy	http://www.pbc.gov.cn/goutongjiaoliu/113456/113469/4342400/2021091617180089879.pdf
ASEAN Sustainable Finance Taxonomy	Microsoft Word - ASEAN Sustainable Finance Taxonomy - Nov 2021
Common Ground Taxonomy (CGT) Report	(IPSF Taxonomy Working Group, 2021) taxonomy – Climate change mitigation instruction report (europa.eu)
Colombian Green Taxonomy	https://www.taxonomiaverde.gov.co/webcenter/portal/TaxonomaVerde
South African Green Finance Taxonomy	SA-Green-Finance-Taxonomy-1st-Edition-Final-01-04-2022.pdf (sustainablefinanceinitiative.org.za)
South Korean Green Taxonomy	https://eiec.kdi.re.kr/policy/callDownload.do?num=222249&filenum=2&dtime=20211230195653
Sustainable Finance Taxonomy for Georgia	Sustainable Finance Taxonomy for Georgia (sbfnetwork.org)
Climate Change and Principle-based Taxonomy of Malaysia	https://www.bnm.gov.my/documents/20124/938039/Climate+Change+and+Principle-based+Taxonomy.pdf

Comparison of Taxonomies

Table 23: Objectives covered in Taxonomies

Objectives coverage ⁵⁷	Taxonomies							
Objectives	EU	CBI	China	Colombia	South Africa	South Korea	Georgia	Malaysia
Climate change mitigation	X	X	X	X	X	X	X	X
Climate change adaptation	X	X		X	X	X	X	X
Sustainable use and protection of water resources	X		X	X	X	X	X	X
Circular economy	X		X	X		X	X	X
Pollution prevention and control	X		X	X	X	X	X	X
Biodiversity and ecosystem protection	X		X	X	X	X	X	X
Social objectives				X	X		X	X

57. Note: Social objectives have been addressed mainly with minimum safeguards. Limitations: Due to the difference between the objectives of the taxonomies, these may not have the same equivalence between countries. Some objectives may have greater coverage than stated, or a different focus or label. Other objectives may be covered through the "Do No Significant Harm" approach.

Table 24: Sector coverage in Taxonomies

Sector coverage ⁵		Taxonomies							
Section	ISIC sections	EU	CBI	China	Colombia	South Africa	South Korea	Georgia	Malaysia
A	Agriculture, forestry, and fishing	X	X	X	X	X	X	X	X
B	Mining and quarrying								X
C	Manufacturing	X	X	X	X	X	X	X	X
D	Electricity, gas, steam, and air conditioning supply	X	X	X	X	X	X	X	X
E	Water supply; sewerage, waste management and remediation activities	X	X	X	X	X	X	X	X
F	Construction	X	X	X	X	X	X	X	X
G	Wholesale and retail trade; repair of motor vehicles and motorcycles			X					
H	Transportation and storage	X	X	X	X	X	X	X	X
I	Accommodation and food service activities								
J	Information and communication	X		X	X	X		X	X
K	Financial and insurance activities	X				X		X	
L	Real estate activities	X	X	X	X	X	X		X
M	Professional, scientific, and technical activities	X	X	X	X		X	X	
N	Administrative and support service activities	X		X					
O	Public administration and defence; compulsory social security								
P	Education	X					X	X	
Q	Human health and social work activities	X						X	X
R	Arts, entertainment, and recreation	X					X	X	
S	Other service activities					X			
T	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use								
U	Activities of extraterritorial organizations and bodies								

5. **Note:** The selected sectors represent those most significant to the fulfilment of mitigation and adaptation objectives. Other enablers are also included. **Limitations:** Due to the difference between taxonomies for the selection and classification of sectors, it is possible that these may not have the same equivalence between countries. In addition, some sectors and/or activities may be represented in grouped, additional or cross-cutting classifications.

Table 25: Taxonomy approaches

Approach	Taxonomies							
Approach	EU	CBI	China	Colombia	South Africa	South Korea	Georgia	Malaysia
Whitelist			X					
Technical selection criteria	X	X		X	X	X	X	
Based on principles								X

Based on IPSF Taxonomy Working Group 2021.

Annex G: Application of the EU Taxonomy

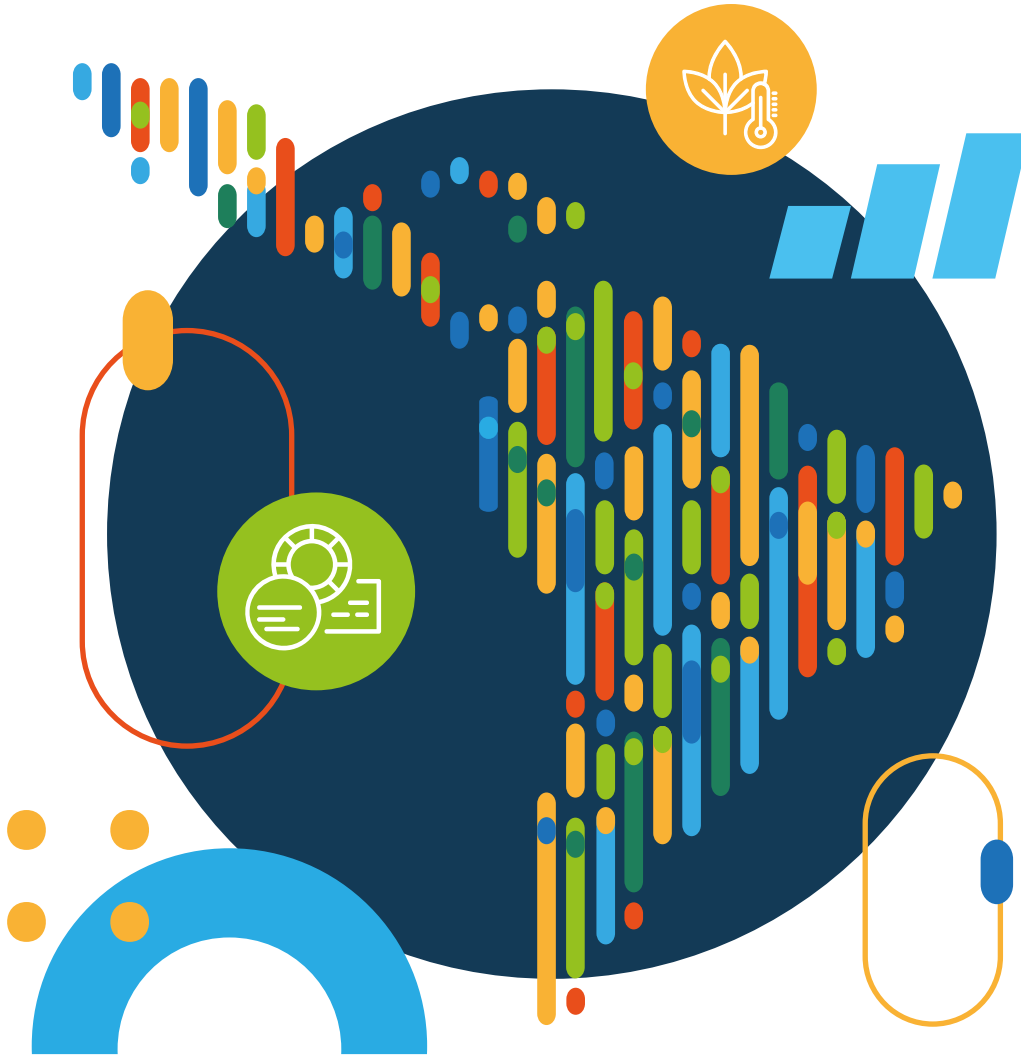
The EU Taxonomy is not a mandatory list of economic activities for investors to invest in. It is a transparency tool setting out several mandatory uses for certain companies and investors. First, it sets out disclosure requirements both for large companies in the scope of the Corporate Sustainability Reporting Directive (CSRD) - that will amend the Non-Financial Reporting Directive (NFRD) – and for financial market participants under the Sustainable Finance Disclosure Regulation (SFDR). Disclosure obligations for large companies are defined in Article 8 of the Taxonomy Regulation, whereas according to Articles 5 and 6 financial market participants will have to disclose how their underlying assets are aligned with the Taxonomy if their financial product is marketed as green. Secondly, the EU Taxonomy also mandates the use of the Taxonomy criteria when Member States and the Union set out EU or national labels and standards for financial products and corporate bonds, which are then made available to investors as “environmentally sustainable”. In this context, the EU Taxonomy is a reference for climate transition and Paris-aligned benchmarks and for the EU Green Bond Standard.

Figure 30: Application of the EU Taxonomy

	Non Financial Company	Investment Manager (incl Pensions & Insurance)	Credit Institution
	Scope: Large listed companies subject to NFRD/CSRD		
Article 8	Annually report Taxonomy eligibility and alignment of 3 KPIs (Turnover, Capex, Opex)	Annually report Taxonomy eligibility and alignment of 2 KPIs (Turnover, Capex) based on the underlying investee companies within the Entity's full AUM (Assets Under Management)	Annually report Taxonomy eligibility and alignment of 2 KPIs (Turnover, Capex) based on exposure in Phases to key balance sheet derived KPI
	Scope: Large listed companies subject to NFRD/CSRD		
Article 5 & 6	Not Applicable	Report Taxonomy Alignment of qualifying financial products in pre-contractual reporting	Credit institution as per Article 2 (1) SFDR are also in scope

(Based on EU Platform on Sustainable Finance)

UN environment programme



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