

Foreign Direct Investment in Latin America and the Caribbean

2023



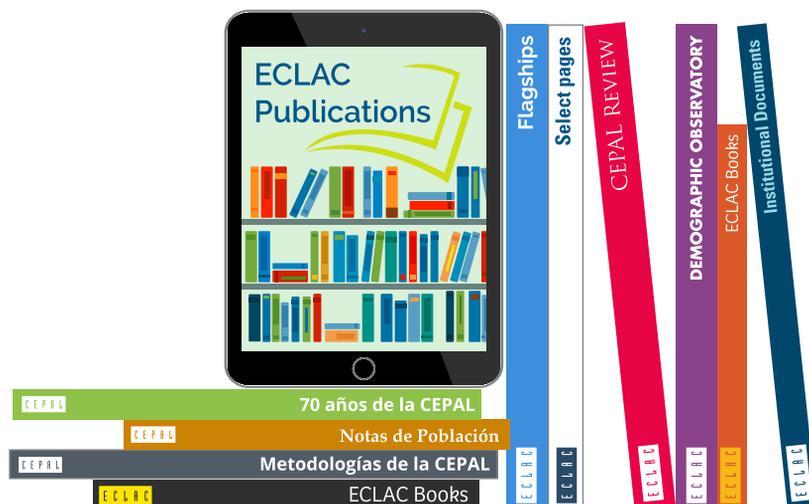
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Foreign Direct Investment in Latin America and the Caribbean **2023**



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José Manuel Salazar-Xirinachs

Executive Secretary

Raúl García-Buchaca

Deputy Executive Secretary
for Management and Programme Analysis

Marco Llinás Vargas

Acting Chief, Division of Production, Productivity and Management

Sally Shaw

Chief, Documents and Publications Division

The 2023 version of *Foreign Direct Investment in Latin America and the Caribbean* is the most recent edition of an annual series produced by the Unit on Investment and Corporate Strategies of the Division of Production, Productivity and Management of the Economic Commission for Latin America and the Caribbean (ECLAC). This year's edition was prepared by Andrea Laplane, Stephania Mageste, Nikolas Passos and Nunzia Saporito, under the coordination of Cecilia Plottier. The databases were prepared by Leandro Cabello.

Comments and suggestions were received from José Manuel Salazar-Xirinachs, Marco Llinás Vargas, Martín Abeles, Vianka Aliaga, Jennifer Alvarado, Hugo Beteta, Horacio Castellaro, Pablo Chauvet, Martín Cherkasky, Carlos de Miguel, Marco Dini, Marina Gil, José Javier Gómez, Álvaro Lalanne, Mauricio León, Santiago Lorenzo, Jorge Mario Martínez, Georgina Núñez, Leda Peralta, Gabriel Porcile, Daniel Taccari, Joseluis Samaniego, Jeannette Sánchez, Cecilia Vera and Paul Wander.

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Executive summary

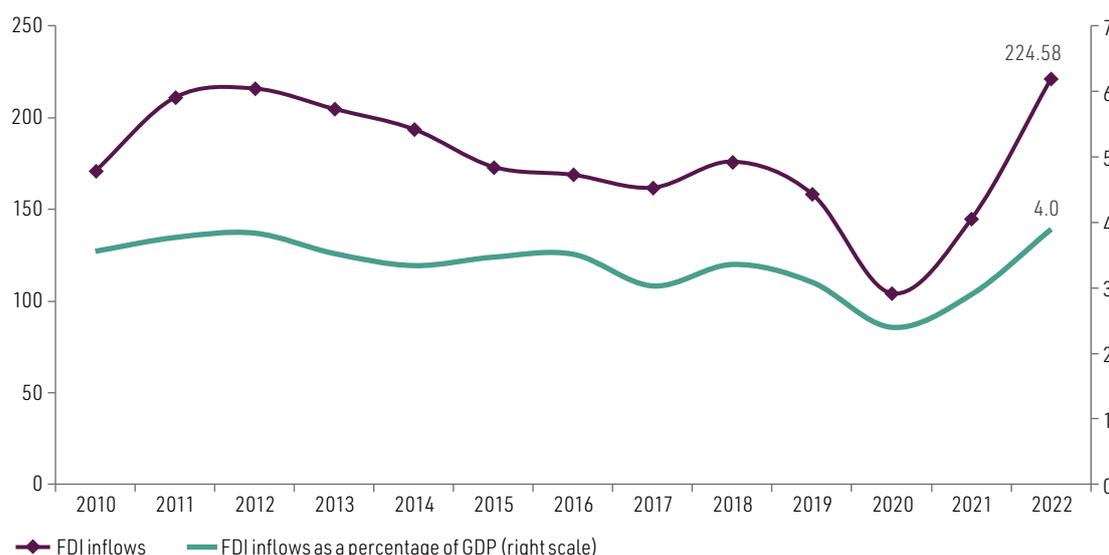
A. Overview of foreign direct investment in Latin America and the Caribbean

In 2022, global foreign direct investment (FDI) inflows fell by 12% compared to 2021 and totalled US\$ 1.29 trillion, a decline that was due largely to significant divestments in Luxembourg. Excluding Luxembourg, the increase in global FDI inflows in 2022 was 11%. The value of cross-border mergers and acquisitions worldwide fell by 6% in 2022 compared to the previous year, owing mainly to weaker sales of companies in the United States, the European Union and Asia (down by 53%, 8% and 17%, respectively) (UNCTAD, 2023). However, FDI announcements—which reflect future investment plans—rose in 2022, mainly in technologically and politically strategic sectors, most notably the renewable energy sector. The value of FDI project announcements worldwide jumped by 64% to around US\$ 1.2 trillion.

In Latin America and the Caribbean, meanwhile, there was a record rebound of foreign direct investment. In 2022, FDI inflows to the region grew by 55.2% compared to 2021, reaching a record high of US\$ 224.579 billion. Since 2013, annual FDI inflows to the region have remained below US\$ 200 billion, meaning that the recovery in 2022 marks an important investment milestone for the preceding decade. This recovery was seen in the main recipient economies and was characterized by a marked interest in services, renewed interest in hydrocarbons and continued interest in manufactures in the countries that have built the largest capacity. With this increase, FDI inflows to the region also rose, to 4.0% of GDP (see figure 1).

Figure 1

Latin America and the Caribbean: FDI inflows, 2010–2022
(Billions of dollars and percentages of GDP)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as at 30 June 2023.

Note: Information computed in accordance with International Monetary Fund (IMF), *Balance of Payments and International Investment Position Manual: Sixth Edition (BPM6)*, Washington, D.C., 2009, except in the cases of Guyana, Paraguay and Peru. No information is available for the Bolivarian Republic of Venezuela from 2016 onward. No 2022 data are available for Barbados and Haiti.

Brazil was the main recipient of FDI inflows in the region (41% of the total), followed by Mexico (17%). Inflows were higher in both countries than in 2021, although growth was stronger in Brazil, which accounted for 56% of the year-on-year change for the entire region. Thus, South America recorded the highest increase in FDI inflows compared with 2021.

All FDI components grew in 2022 relative to 2021, with the strongest growth recorded in reinvested earnings and intercompany loans. Reinvested earnings became the main component of FDI in the region, accounting for 43% of the total, following growth of 50% compared with the previous year. One possible explanation is that the effects of the coronavirus disease (COVID-19) pandemic likely prompted many companies to retain earnings in 2020, and subsequently direct these earnings towards a resumption of activities in 2021 and 2022. Equity, the second largest component, accounted for 36% of FDI inflows to the region in 2022, up by 22% compared to 2021. Of the three components, intercompany loans registered the strongest growth (283%), and accounted for 21% of all FDI inflows in the region.

The analysis of mergers and acquisitions in the region shows that there was an increase in foreign investors' interest in companies operating in the region. Compared to 2021, cross-border mergers and acquisitions in Latin America and the Caribbean increased in 2022, both in number (to 327, up by 7%) and in value (to US\$ 30.147 billion, 57% higher). Despite this promising trend, the amount mobilized remains below pre-pandemic levels. Brazilian assets once again attracted the most interest from transnational firms, as 31% of the deals completed in the region in 2022 took place in the country, representing growth of 18% with respect to the sluggish performance of 2021. Mexico ranks second with 29%. In almost all of the countries, more deals were closed in 2022 than in 2021. The case of Jamaica is noteworthy as the country posted a ten-year record amount for transactions —US\$ 1.6 billion, linked to a sale in the telecommunications sector.

Announcements of investment projects in 2022 reflected an improved outlook for future investments. After falling in 2020 and 2021, the value of new FDI projects in the region increased by 92.5% in 2022, to close to US\$ 100 billion. The number of announced projects also increased (by 15.3%), to 1,413. However, the number and value of announced projects both remained below the record levels seen in 2018 and 2019. The value of the announced projects was primarily concentrated in large projects, essentially in the oil and gas, mining and renewable energy sectors.

Analysis of FDI inflows in countries for which sectoral data are available shows that in 2022, services accounted for the largest share (54%), followed by manufacturing (30%) and natural resources (17%). The lowest relative growth recorded was in investments in services (35%). Regardless, with this rate, services was the only sector above historical averages, and even the 2022 level was 10% higher than the previous peak reached in 2017. Growth in services was largely even across the region, increasing by 47% in Mexico, 32% in Brazil and 28% in the other countries, on average.

Manufacturing investments, which followed a downward trend in previous years, grew by 46% relative to 2021, but remained 17% lower than 2019 levels. There was no reversal in the long-term trend of declines in manufacturing investments, seen since 2013, and levels remained 50% below the peak reached in 2013. The highest rate of year-on-year growth was in Brazil (157%), but the country also recorded the most significant long-term decline in manufacturing investment (down from an average of US\$ 36 billion between 2010 and 2014 to US\$ 19.642 billion in 2022).

With regard to FDI outflows from Latin America and the Caribbean, in 2022, they jumped to a record US\$ 74.677 billion, up 80% compared to the previous year. This figure, which reflects mainly significant increases in outward investment from Brazil and Mexico, is the highest since the series was first compiled in the 1990s, and over US\$ 30 billion more than the amount invested in 2021. It is partly a consequence of investments announced in 2019 being postponed because of the COVID-19 pandemic.

Lastly, the challenge of attracting and retaining FDI that contributes to sustainable and inclusive development in the region remains as relevant as ever, and countries must make efforts to enact the right kind of policies if they are to have FDI that supports their development process and allows for the realization of the potential of FDI to build capacities, create quality jobs, transfer technology and enhance the diversification and sophistication of the production mix. One of the main reasons given for using public resources to attract investment is the potential of FDI to drive production linkages and transfers of knowledge and technology, and thus support economic growth (ECLAC, 2010).

In Latin America and the Caribbean as in the rest of the world, policy instruments have progressively become more diversified, however the main incentives for attracting investment are still grounded in tax-related measures. Although tax incentives can influence investment decisions to some degree, they are not enough to attract investment. A combination of diverse factors is required, including infrastructure, production capacity, a skilled workforce and a set of complementary activities along the value chain, meaning that efforts to attract FDI must be coordinated with actions usually taken under production development policies and agendas.

However, Latin American and Caribbean countries have only relatively recent experience in policies to attract investment, and they must improve policy design in order to attract investment and strengthen the relevant institutional capacity. It will be key to boost the coordination of efforts to attract FDI with production development strategies and to begin using FDI more deliberately as a strategic tool to further sustainable development processes.

B. Foreign direct investment in non-renewable energies: challenges for the energy transition in Latin America and the Caribbean

Internationally concerted efforts to rapidly mitigate climate change have generated major pressure to divest from the hydrocarbons sector. The commitments made by countries and firms to reduce their greenhouse gas (GHG) emissions, over the coming decades, have placed the search for renewable energy sources at the heart of their decarbonization strategies. However, in the face of rising energy prices driven mainly by the conflict between the Russian Federation and Ukraine, the energy transition debate has taken on a new dimension, related primarily to energy security.

Despite international efforts to decarbonize the sector, there has been a tentative resumption of FDI flows in non-renewables, especially in response to the rebound in hydrocarbon prices, the discovery of non-conventional energy sources and the dissemination and lower cost of the technologies needed to make their exploitation and commercialization viable. Moreover, the insufficient investment levels in renewables registered since 2015 indicate that non-renewables will continue to be a significant source of energy in the coming decades (IEA, 2022) and that firms are likely to continue to invest in the exploration, refining and commercial exploitation of hydrocarbons.

Globally, greenfield investment announcements have generally outweighed purchases of existing assets in recent years. Although the figures are not directly comparable owing to their nature (the former are investment intentions, while asset purchases via mergers and acquisitions refer to completed transactions) and reflect high volatility, project announcements have been the main vehicle through which firms in the non-renewable energies sector have internationalized their businesses.

Latin America and the Caribbean is the region that receives the fifth largest amount of investment in the sector, absorbing 9% of the total; and it is the lowest ranked region of origin in terms of projects (2% in total). As in the rest of the world, the internationalization of the region's oil, coal and natural gas sector has been dominated by new investment project announcements. Nonetheless, during the period under review, the region was the destination of investment announcements in greenfield projects averaging approximately US\$ 9.15 billion per year, compared to an average of US\$ 5.723 billion per year in the case of mergers and acquisitions. However, the inherent volatility of the hydrocarbons sector makes it difficult to identify a clear pattern or trend, since large announcements or transactions generate significant year-on-year variations in total amounts.

Comparing the amounts of project announcements and cross-border mergers and acquisitions in Latin America and the Caribbean in 2015–2022 reveals that transnational oil and gas firms wishing to

invest in the countries of the region tend to use different instruments, depending on the stage of the value chain in which the venture is located, and on whether they have a pre-existing presence in the destination country. Moreover, the investments tend to complement each other, whether they are related to different modalities (mergers and acquisitions or greenfield projects) or to different stages of the value chain. Investments in the prospecting, exploration, production and decommissioning (upstream) stage of the oil, coal and natural gas value chain are usually the starting point from which transnational firms execute their strategy in Latin America and the Caribbean. This defines the growth of their investments in the expansion of existing projects, other similar ventures, or other stages of the value chain—the stage consisting of crude oil and natural gas transportation and storage activities (midstream) or that comprising the refining or processing of crude oil and natural gas, together with its distribution, sale, and final use (downstream)— which promote the processing and distribution of the extracted hydrocarbons.

Between 2010 and 2021, the amounts announced in renewable energy projects in Latin America and the Caribbean outstripped those of non-renewables, with the latter's share dwindling from 24% of total announcements in 2005, to just 5% in 2021. Nonetheless, an increase in the amount of announcements of oil, gas and coal projects in the region in 2022, driven by a large project in Guyana, meant that this total outweighed that of renewable energy announcements for the first time in over 10 years. As a result, the non-renewables sector remains a leading sector in terms of future investment prospects in the region.

The importance of petroleum assets in the region has also generated a substantial volume of cross-border mergers and acquisitions. In 2022, the oil, natural gas and coal sector generated the third largest number of such transactions in Latin America and the Caribbean, accounting for 21% of the total (while renewables ranked fifth with 5%).

Inward FDI in the non-renewable energies sector in Latin America and the Caribbean reflects not only the high volatility inherent to the sector, which stems mainly from fluctuations in the prices of such energy sources on international markets, but also the discovery of new hydrocarbon sources in the region and changes in the structure of local markets. The regulation of foreign capital inflows into the industry is a key factor in understanding the dynamics of FDI in the sector.

However, investments in the sector are subject to uncertainties. One of the main risk factors is stranded assets, which are assets that have suffered from unanticipated or premature write-downs, devaluations, or conversion to liabilities (Caldecott and others, 2016) as a result of some exogenous factor. In the context of the energy transition, fossil fuel reserves and other capital investments for the exploration, production and refining of these energy sources can be rendered inoperable, because of the need to fulfil climate commitments. As a result, they become liabilities before the end of the payback period, or the corresponding installations have to be decommissioned prematurely, turning them into stranded assets (Nunes and Costa, 2021). Depending on the country context, the inclusion of this type of risk in project feasibility calculations may cause hesitation in short-term investments and even instability in the financial markets (Nunes and Costa, 2021). In the region, the amount of capital to be withdrawn prematurely from the energy sector over the next 30 years is estimated at between US\$ 37 billion and US\$ 90 billion (Binsted and others, 2020).

Other key elements in the analysis of future investments in the non-renewable energies value chain in the context of the energy transition include carbon dioxide capture and storage and carbon capture, utilization and storage technologies. These technologies are based on processes that separate CO₂ from industrial emission sources, and store and isolate it from the atmosphere over the long term, or that enable captured carbon to be used in industrial processes (IPCC, 2005). The region has the geological potential for applying these technologies, particularly in the context of new installations (Nunes and Costa, 2021). However, the costs of these technologies remain high, and no large-scale commercial projects have yet been implemented at the global level, despite recently announced incentives in some countries, notably the United States.

This scenario gives the region's governments an even more important role. First, they are responsible for defining the regime under which non-renewable resources will be exploited, their exploitation policy and how the revenues from the activity will be used to the benefit of society. They must also play an active role in defining how these resources will be maximized, either by promoting economic activities in other stages of the hydrocarbon value chain, or beyond, by fostering the productive development of other sectors. In addition, they have a role in evaluating the feasibility of providing incentives for the large-scale adoption of technologies such as carbon capture and storage or carbon capture, utilization and storage, which are essential for the future of the hydrocarbons industry.

Second, governments must be the lead actors in coordinating strategies to achieve a successful energy transition in the region. They are responsible for making sure that non-renewable energy activities are reduced radically, as required by the climate commitments, while managing to mitigate their negative effects and their economic and social costs, especially in terms of investments, employment and income. One of their central functions is to develop long-term policies that promote investments in renewable energy sources, so that the transition is rapid and secure, and does not leave the region lagging behind in a context in which energy from clean sources is a factor of competition. International cooperation also has a key role, as a source of both guidelines and know-how, and resources and technologies that make a just energy transition possible.

C. Foreign direct investment in renewable energies: strategies to advance the energy transition in Latin America and the Caribbean

Renewable energies have been one of the main drivers of international investment. In 2005, foreign investment announcements in this area accounted for only 6% of total energy-related foreign investment announcements worldwide by value; in 2022, they accounted for 80%.

The interest of international companies in renewable energy sources was mainly driven by the increasing competitiveness of the sector. The cost of generating renewable energy, and in particular photovoltaic solar and wind power, has decreased worldwide because of technological advances. Between 2010 and 2020, global average levelized costs fell by 85% for photovoltaic solar energy projects, 56% for onshore wind projects and 48% for offshore wind projects (IEA, 2022).

Developed countries have managed to combine policies to develop their domestic markets with the search for new international markets, with the result that these countries are the leading international renewable energy investors and the development of the technologies for producing renewable energy is concentrated therein. Between 2005 and 2022, FDI announced by European companies accounted for 61% of the total in the sector. Companies from Europe, in particular Italy, Spain and France, have been the leading investors in all regions of the world except Asia and the Pacific, where intraregional investments dominate.

Solar and wind technologies have cemented their dominance at global level, accounting for the bulk of FDI project announcements. Between 2005 and 2022, wind energy attracted FDI projects worth US\$ 570 billion, solar energy projects worth US\$ 444 billion, and biomass and biofuel energy projects worth US\$ 170 billion. The three technologies accounted for 70% of all announced FDI in the sector. Developed countries' policy agendas for advancing the energy transition have had a significant impact on emerging green technologies, especially storage technologies and green hydrogen. Since 2016, these technologies have mobilized US\$ 210 billion in announcements, or 14% of the total, and in 2022 they accounted for about 40% of the announced amount of global FDI.

In Latin America and the Caribbean, the renewable energy sector has been among those attracting the most investment, ranking third by the amounts announced. In the period 2005–2022, there were more than 800 FDI project announcements involving this sector in the region, worth a total of almost US\$ 170 billion. Between 2010 and 2021, announced investments in clean energy outstripped investment in fossil energy.

The main destination countries have been Brazil, Chile, Mexico, Panama and Peru, together attracting more than 80% of all announcements in the region. However, in most countries of the region, FDI has been reshaped, with a shift towards renewable energies. Companies from European Union countries were responsible for 63% of the value of all renewable energy FDI projects announced in the region between 2005 and 2022. In line with the global trend, solar and wind technologies attracted the largest number of FDI projects and accounted for more than 70% of the value of all investment in renewable energies.

Renewable energy investment announcements in the region peaked in 2019 at more than 120 projects totalling US\$ 20.5 billion. Since the outbreak of the COVID-19 pandemic, there has been a marked slowdown caused by two main factors: the rising cost of capital to implement solar and wind projects, and the reshaping of the energy agenda in Europe and the United States. In 2022, renewable energy project announcements rebounded, growing by 30% over 2021, with 37 projects worth a total of US\$ 10.4 billion announced.

The countries of Latin America and the Caribbean are very well positioned to take advantage of the energy transition, since they have well-developed energy markets and great potential in terms of their endowment of renewable energy resources. The region's countries have progressively greened their electricity generation mix in recent decades, so that it is now among the world's cleanest. However, renewable energy generation has been dominated by the large installed hydroelectric capacity in those countries. The effects of climate change and alterations in rainfall intensity are increasing the vulnerability of water sources, requiring renewable energy generation sources to be diversified beyond hydropower (IEA, 2021). Expansion of the installed capacity of other technologies, in particular solar and wind power, represents a major opportunity to accelerate the region's energy transition and diversify its energy mix.

Furthermore, international experience shows that the energy sector can create production linkages in sectors related to the transition. For one thing, activities associated with the renewable energy value chain, from critical minerals and technology development to the provision of engineering, construction and maintenance services, represent an opportunity to strengthen production capabilities and develop new service sectors. For another, clean energy can increase the region's energy efficiency and encourage more energy-intensive production activities, as in the case of green hydrogen. A growing supply of renewable energy sources will not only be essential to meet the region's rising demand, but could also become a strategic asset to attract investment in other sectors, not just renewable energy.

Major financing needs will have to be met if the energy transition in the countries of Latin America and the Caribbean is to advance. Given that there is little fiscal space in the region's countries to increase investment in renewable energy on the scale needed to achieve the energy transition, it is essential for governments to have the right policies and instruments in place to attract private investment from the region and the world. According to the International Renewable Energy Agency (IRENA, 2021), investment in the sector will need to double by 2030 and then grow yet further to three times current levels if the goals set are to be achieved.

Although Latin America and the Caribbean has been a strategic destination for renewable energy investments, if it is to secure the resources it needs to carry forward the energy transition, it will have to implement medium- and long-term strategies that mobilize domestic and international investment in renewable energy development. FDI can play a vital role in accelerating the energy transition, facilitating technology transfer and enabling emerging technologies. However, investment policies

need to be designed in the broader context of energy transition policies, taking into account the drivers of investment, market forces and international technology development to calibrate the toolbox and steer investments towards priority technologies, sectors or stages of the chain. These agendas need to be supported by institutional mechanisms that facilitate coordination between different parts of the public sector, between the public and private sectors, and between the different levels.

The Economic Commission for Latin America and the Caribbean (ECLAC, 2023) has identified the energy transition as one of the strategic areas of action to spur the region's recovery. A successful energy transition could become a comparative advantage in efforts to attract investment in other sectors, such as energy-intensive industries, and to attract activities that complement renewable energies, such as those related to green hydrogen and the development of carbon-neutral technologies. In a very dynamic international market, the countries of the region have a great opportunity to make progress with this important challenge.

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CHAPTER



Foreign direct investment in Latin America and the Caribbean 2023

- A. Global foreign direct investment in 2022 did not maintain the growth seen in 2021
 - B. Record rebound of FDI in Latin America and the Caribbean
 - C. FDI outflows from Latin America and the Caribbean: outward investment hit record highs
 - D. Policies to attract investment
 - E. Conclusions
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A. Global foreign direct investment in 2022 did not maintain the growth seen in 2021

After bouncing back in 2021, cross-border investments worldwide faced new headwinds in 2022. Multiple international crises, the conflict in Ukraine, high inflation, interest rate hikes in advanced economies and uncertainties in the financial system weighed on global foreign direct investment (FDI) inflows, which in 2022 fell by 12% compared to 2021 and totalled US\$ 1.29 trillion (see table I.1). This decline was due largely to major divestments in Luxembourg, a global financial centre. Excluding Luxembourg, the increase in global FDI inflows in 2022 was 11%.

Table I.1

World (selected countries and regions): FDI inflows, 2018–2022
(Billions of dollars)

	2018	2019	2020	2021	2022	Share in 2022 (Percentages)	Variation 2022/2021 (Percentages)
United States	203.234	229.929	95.882	387.780	285.057	22	-26
China	138.306	141.225	149.342	180.957	189.132	15	5
Singapore	73.561	97.484	72.903	131.151	141.211	11	8
Hong Kong, China	104.246	73.714	134.710	140.186	117.725	9	-16
Brazil	78.163	69.174	37.786	46.439	91.502	7	97
Australia	67.568	38.886	13.583	20.899	61.629	5	195
India	42.156	50.558	64.072	44.763	49.355	4	10
European Union (27 countries)	309.973	600.079	115.623	152.381	-124.948	-10	-182
Luxembourg	-83.336	163.718	9.839	25.123	-322.054	-25	-1.382
Netherlands (Kingdom of the)	99.381	-1.140	-86.507	-77.453	-67.340	-5	-13
Sweden	5.269	8.761	21.514	21.133	45.963	4	117
France	41.833	13.100	11.359	30.885	36.413	3	18
European Union (excl. Luxembourg)	393.309	436.361	105.784	127.258	197.106		55
World (excl. Luxembourg)	1.458.773	1.544.112	952.144	1.453.014	1.616.792		11
World	1.375.437	1.707.830	961.983	1.478.137	1.294.738		-12

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations Conference on Trade and Development (UNCTAD), "Annex table 1: FDI flows, by region and economy (2017–2022)", *World Investment Report 2023*, 2023 [online] <https://unctad.org/publication/world-investment-report-2023>.

The United States and China remained the chief recipients of FDI, although investments decreased in the former and increased in the latter, while Brazil was the world's fifth largest destination. The European Union, which has traditionally attracted a large share of investment, registered negative inflows in 2022. However, excluding the divestments in Luxembourg, FDI inflows into the European Union grew by 55% in 2022, with Sweden and France attracting the most investments.

The financial environment, including the deterioration of financing conditions due to the increase in interest rates by the main central banks, has had a significant impact on mergers and acquisitions. Rising interest rates virtually shut down leveraged finance markets as banks and other lenders faced a large backlog of transactions requiring financing (Morgan Stanley, 2023). In addition, the indirect effects of the conflict in Ukraine could have more profound and far-reaching consequences for multinational companies, which may have been felt in 2022 or could be reflected later (OECD, 2022a; Liu, 2022). The negative effects on multinational companies more exposed to the Russian Federation

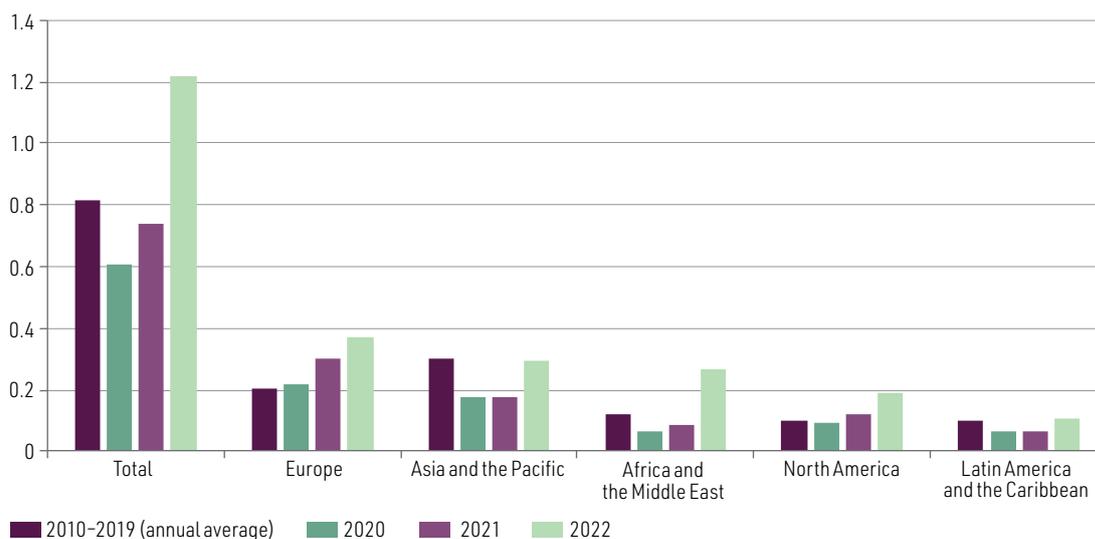
may spread through the value chain, affecting bank liquidity and solvency, tightening global financial conditions, increasing borrowing costs for emerging and developing economies, and leading to financial strain (Liu, 2022). Rising commodity prices and inflation may also slow global growth and private investment if interest rates are raised in advanced economies, while elevated uncertainty and geopolitical risks may damp investor confidence, discourage new investment, and cause some companies to limit their operational footprint (Liu, 2022).

In this context, the value of cross-border mergers and acquisitions worldwide fell by 6% in 2022 compared to the previous year, owing mainly to weaker sales of companies in the United States, the European Union and Asia (down by 53%, 8% and 17%, respectively) (UNCTAD, 2023). In Latin America and the Caribbean, meanwhile, mergers and acquisitions increased with respect to 2021, as will be discussed in detail below.

Unlike capital movements and cross-border mergers and acquisitions, FDI announcements—which reflect future investment plans—rose in 2022, mainly in technologically and politically strategic sectors, and owing to the increase in the value of projects, primarily in renewable energies. The value of FDI project announcements worldwide jumped by 64% to around US\$ 1.2 trillion, well above the average of the 2010 decade (see figure I.1). Project announcements increased in all regions of the world, most notably in Africa and the Middle East. In Africa, the announcement of 69 large-scale renewable energy projects accounted for the growth and represented more than 60% of the total value of projects announced for the region.

Figure I.1

FDI project announcements, by region, 2010–2019, 2020, 2021 and 2022
(Trillions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] <https://www.fdimarkets.com/>.

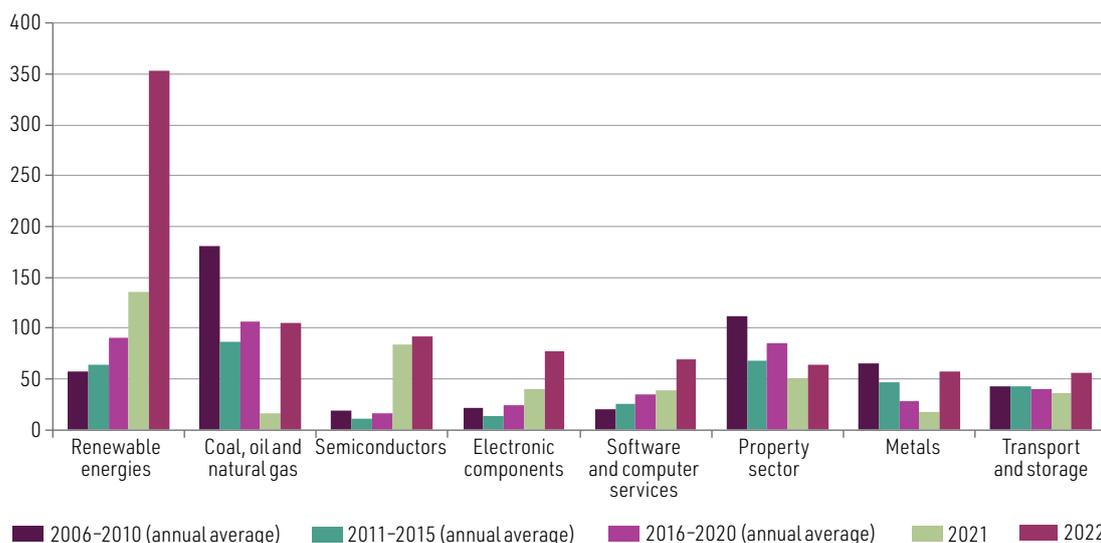
With regard to new projects by sector, energy accounted for a large share of the investment announcements for 2022. Chapters II and III of this report analyse the main reasons behind the recent trend in FDI in non-renewable and renewable energies in the world and in the region. Renewable energies accounted for a record share of total FDI project announcements (29%), after having more than doubled in value (160%) (see figure I.2). However, the coal, oil and natural gas sector recorded the highest year-on-year growth in amounts announced (524%) and became the second largest sector in 2022 (9% of the total). After recording exceptional growth in 2021, semiconductor investment

announcements remained strong and even increased by a further 9% in 2022, accounting for 8% of global amounts announced. Electronic components and software and computer services also recorded considerable growth, 92% and 81%, respectively.

Figure I.2

Global FDI project announcements, main sectors, 2006–2022

(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] <https://www.fdimarkets.com/>.

The metals sector also saw a sharp increase (218%) and accounted for 5% of the value of FDI project announcements. While all minerals subsectors grew, the most notable increase was seen in iron and steel production, followed by copper, nickel, lead and zinc mining. Non-ferrous metal production, which includes projects related to the battery supply chain, also registered remarkable and record high growth. Latin America accounted for just 11% of the projects announced in the metals sector, while Asia and the Pacific (34%) and North America (20%) were the main destinations.

Mounting geopolitical tensions and recent crises have resulted in greater scepticism towards multilateralism and the growing appeal of inward-looking policies, mainly in advanced economies (IMF, 2023). Events such as the decision by the United Kingdom of Great Britain and Northern Ireland to leave the European Union, or “Brexit”, trade tensions between the United States and China, and the conflict in Ukraine, could lead to geoeconomic fragmentation, which could affect FDI flows.

Against this backdrop, companies are adopting new strategies to manage their global supply chains, including the transfer of global supply chain operations to countries geographically close to the country of origin (nearshoring) and moving supply chain operations from one country back to the country of origin (reshoring).

According to the International Monetary Fund (IMF, 2023), FDI flows are increasingly concentrated in geopolitically aligned countries, especially in strategic sectors, such as semiconductors. Geopolitical alignment plays a significant role in driving FDI, particularly for emerging and developing economies, and, according to IMF (2023), has become more important since 2018, with the resurgence of trade tensions between the United States and China.

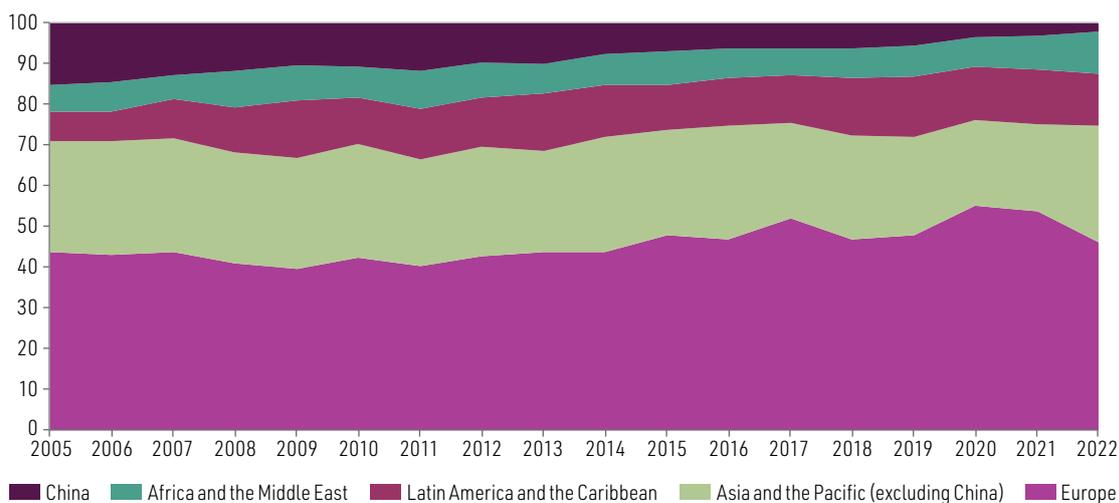
In this regard, the number of investment projects of United States companies in China has declined considerably over the past decade, reaching the lowest point in 2022, with only 74 projects worth

approximately US\$ 3.7 billion (in 2006, 425 projects worth approximately US\$ 24 billion were registered). By contrast, there was a notable increase in announcements in Europe and a moderate increase in those in Asia and the Pacific and in Latin America and the Caribbean (see figure I.3).

Figure I.3

United States: FDI project announcements, by region of destination, 2005–2022

(Percentages)



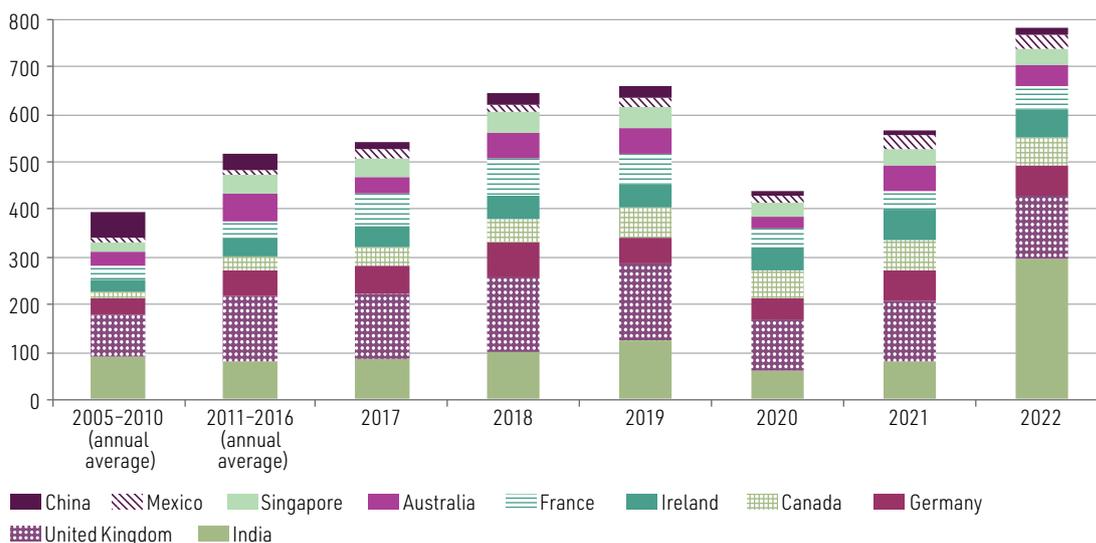
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] <https://www.fdimarkets.com/>.

In terms of the number of projects announced by United States-based companies, software and computer services was the leading sector, followed by business services and communications. In the three main sectors, China's share of the number of projects announced has decreased, while those of India and Europe have grown sharply. In the software and computer services sector, Mexico's share of announced projects has trended slightly upward (see figure I.4).

Figure I.4

United States: FDI project announcements in the software and computer services sector, by major country of destination, 2005–2022

(Number)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] <https://www.fdimarkets.com/>.

The effects of nearshoring in Latin America are still unclear, and are expected to be felt more in Central America and the Caribbean, especially in Mexico, owing to trade agreements and the shared border (Garrido, 2022). Although still an emerging phenomenon, the number of companies that have downsized or shut down operations in one country to relocate them to other countries has been increasing over the past decade. According to data available on the *Financial Times* database, fDi Markets, the number of project announcements involving relocations rose from 23 in 2013 to 132 in 2022. The largest number of project relocations, 173, was recorded in 2018, while the highest overall value, US\$ 10 billion, was recorded in 2022. These figures are still low, and between 2003 and 2022, relocations accounted for less than 2% of the total number of projects announced worldwide. United States-based companies announced the highest number of relocations —nearly 200— followed by the United Kingdom and Germany. In terms of the destination for relocation, the United States was also the preferred option, accounting for more than 300 projects over the period. Notably, more than 49 projects were relocated to Mexico between 2003 and 2022. Half of these projects were announced by United States-based companies and are linked to the development of manufacturing activities. The automotive sector and the machinery and equipment industry stand out, among others. Although various factors can trigger a relocation from one country to another, the presence of productive capacity throughout supply chains and of specialized suppliers are significant factors.

B. Record rebound of FDI in Latin America and the Caribbean

1. Main recipient countries, components and impact on the balance of payments

In 2022, FDI inflows to Latin America and the Caribbean grew by 55.2% compared to 2021, reaching a record high of US\$ 224.579 billion. Since 2013, annual FDI inflows to the region have remained below US\$ 200 billion, meaning that the recovery in 2022 marks an important investment milestone for the preceding decade. This recovery was seen in the main recipient economies and was characterized by a marked interest in services, renewed interest in hydrocarbons and continued interest in manufactures in the countries that have built the largest capacity. With this increase, FDI inflows to the region also rose, to 3.9% of GDP (see figure I.5).

Brazil was the main recipient of FDI inflows in the region (41% of the total), followed by Mexico (17%), and inflows were higher in both countries than in 2021 (see table I.2), although growth was stronger in Brazil, which accounted for 56% of the year-on-year change for the entire region. Thus, South America recorded the highest increase in FDI inflows compared with 2021. The Plurinational State of Bolivia was the only country in the subregion that did not register higher inflows. Apart from Brazil, the other main recipients were Chile, Colombia, Argentina and Peru. Investment inflows to Central America declined, but reflected mixed trends from one country to the next. The extraordinary FDI inflow to Guatemala in 2021 from a sale in the telecommunications sector partially accounts for the negative change in the subregion, while in Costa Rica, which was the Central American country with the largest inflows, levels remained nearly the same as in 2021. The change in FDI inflows in the Caribbean was positive, driven mainly by higher levels of investment in the Dominican Republic, which despite the greatest increase ranked second as a recipient country after Guyana, while investment fell in countries in the Organisation of Eastern Caribbean States (OECS). Section I.F presents a detailed analysis of the trend for each country.

Country	2013–2017	2018	2019	2020	2021	2022	Absolute change 2022–2021	Relative change 2022–2021 (Percentages)	Share in 2022 (Percentages)
Mexico	37 526	37 857	29 906	31 519	33 478	38 932	5 455	16.3	17.3
Central America	11 551	12 526	10 232	1 804	11 144	9 813	-1 331	-11.9	4.4
Costa Rica	2 990	3 015	2 719	2 103	3 593	3 673	81	2.2	1.6
El Salvador	424	826	636	272	308	-101	-409	-132.7	0.0
Guatemala	1 291	981	976	935	3 462	1 352	-2 109	-60.9	0.6
Honduras	1 236	1 380	947	224	800	1 082	281	35.2	0.5
Nicaragua	1 007	838	503	747	1 220	1 294	74	6.0	0.6
Panama	4 604	5 487	4 451	-2 477	1 761	2 513	752	42.7	1.1
The Caribbean^a	6 237	5 979	7 227	7 531	9 008	9 740	969	11.0	4.3
Antigua and Barbuda	102	205	128	77	245	196	-49	-19.9	0.1
Bahamas	1 603	947	611	897	1 052	1 255	203	19.3	0.6
Barbados	321	242	215	262	237	0	...	...	...
Belize	76	118	94	76	125	134	8	6.4	0.1
Dominica	22	78	63	22	34	28	-6	-16.5	0.0
Dominican Republic	2 476	2 535	3 021	2 560	3 197	4 010	814	25.5	1.8
Grenada	123	186	204	136	140	160	20	14.5	0.1
Guyana	167	1 232	1 695	2 060	4 454	4 389	-65	-1.5	2.0
Haiti	167	105	55	...	...	...	...	...	...
Jamaica	774	775	665	265	320	319	-1	-0.2	0.1
Saint Kitts and Nevis	119	40	62	6	26	16	-11	-41.2	0.0
Saint Lucia	113	46	76	48	86	67	-19	-22.2	0.0
Saint Vincent and the Grenadines	129	40	69	65	160	86	-74	-46.1	0.0
Suriname	203	131	84	1	-133	-5	127	-96.0	0.0
Trinidad and Tobago	-157	-700	184	1 056	-935	-914	21	2.3	-0.4
Total^a	180 292	175 877	158 153	103 807	144 981	224 579	79 835	55.2	100.0

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as at 30 June 2023.

^a In calculating the absolute and relative differences, those countries for which no data are available for 2022 are excluded from 2021.

Analysis of FDI shows that all components grew in 2022 relative to 2021, but reinvested earnings and intercompany loans recorded the strongest growth. For the first time since 2010, reinvested earnings became the main component of FDI in the region (43% of the total), following growth of 50% in 2022 compared with the previous year. One possible explanation for the increase in this component is that because of the extraordinary slowdown in economic activity caused by the coronavirus disease (COVID-19) pandemic, many companies may have retained earnings in 2020. In 2021 and 2022, given the gradual economic recovery in the countries of the region, companies may have directed these earnings towards a resumption of activities (see figure I.6).

Figure I.6

Latin America and the Caribbean: FDI inflows, by component, 2010–2022
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as at 30 June 2023.

Note: Barbados and the Bolivarian Republic of Venezuela are not included because data for these countries are not available for 2022. El Salvador, Guyana, Haiti and Jamaica are also excluded because data by component are not available. The data by component for the Plurinational State of Bolivia represent gross FDI inflows.

Equity, the second largest component, accounted for 36% of FDI inflows to the region in 2022, up by 22% compared to 2021. Although this component approached 2019 values in 2022, it remained below the levels observed prior to 2013. Bearing in mind that the investments of new companies are included in this component, either through greenfield projects or mergers and acquisitions, stronger momentum in equity inflows would be a better indicator of the greater presence of multinational companies in the region.

Of the three components, intercompany loans registered the strongest growth (283%), and accounted for 21% of all FDI inflows in the region. Brazil stands out in that regard —intercompany loans were negative in 2021, at - US\$ 466 million, while in 2022, they amounted to US\$ 21.075 billion (see section I.F and box I.1).

Box I.1

High interest rates and the growth of intercompany loans

It is essential to understand the reasons behind the growth in intercompany loans, which reflect lending between subsidiary and parent companies, in foreign direct investment (FDI) inflows in Latin America and the Caribbean in 2022. De Camino, Pérez-Caldentey and Vera (2023) argue that there are three reasons for FDI to take the form of intercompany loans, relating to: (i) taxes (minimizing taxes on earnings), (ii) the carry trade (leveraging differences in interest rates), and (iii) the economic cycle. Global interest rate rises could also be an important driver. The benchmark interest rate hikes implemented in developed countries to dampen inflation have increased financing costs for emerging economies (Arteta, Steven and Ulrich, 2022), including in Latin America and the Caribbean. This may have prompted a rise in intercompany loans, which include more robust guarantees by parent companies, as a way of facilitating local subsidiaries' access to financing (KPMG, 2022).

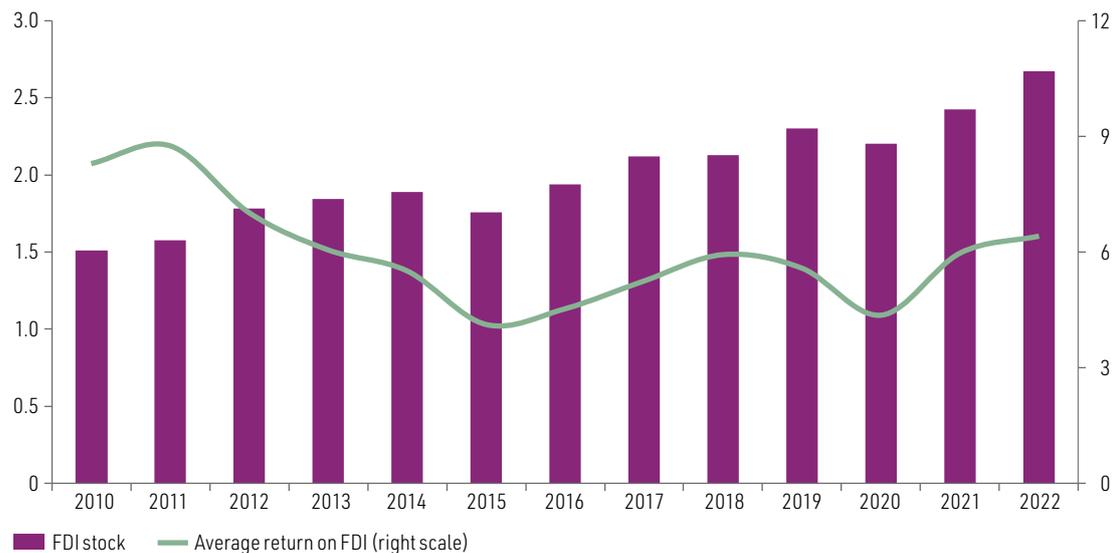
There is increasing evidence that the non-financial corporate sector, in addition to financing its own operations, is acting as a financial intermediary, capturing liquidity from international equity markets and investing it both in-country and abroad (De Camino, Pérez-Caldentey and Vera, 2023). However, these intercompany loans tend to be short-term and are more likely to be suddenly called in than equity investments, which can lead to greater financial instability (De Camino, Pérez-Caldentey and Vera, 2023).

Source: C. Arteta, K. Steven and F. Ulrich, "How do rising U.S. interest rates affect emerging and developing economies? It Depends", *Policy Research Working Paper*, No. 10258, World Bank, 2022; C. De Camino, E. Pérez-Caldentey and C. Vera, "Non-financial corporations as financial intermediaries and their macroeconomic implications: an empirical analysis for Latin America", *Foreign Exchange Constraint and Developing Economies*, Edward Elgar Publishing, 2023 and KPMG, "Implications of rising interest rates on intercompany financing", 2022 [online] <https://kpmg.com/be/en/home/insights/2023/01/ctx-rising-interest-rates-and-intercompany-financing.html>.

In 2022, the region's FDI stock amounted to US\$ 2.86 trillion and was concentrated in Brazil (36%), Mexico (25%), Chile (10%), Colombia (8%), Peru (5%) and Argentina (4%). FDI income for 2022, which is to say the returns generated by these investments in the year, totalled US\$ 172.260 billion, meaning an average rate of return on FDI of 6.3%, above the rate for 2021 and the highest since 2013 (see figure I.7).¹ Commodity price increases, which have boosted the income of foreign companies that export them, contributed to the growth in income.

Figure I.7

Latin America and the Caribbean: FDI stock and average return, 2010–2022
(Trillions of dollars and percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as at 30 June 2023.

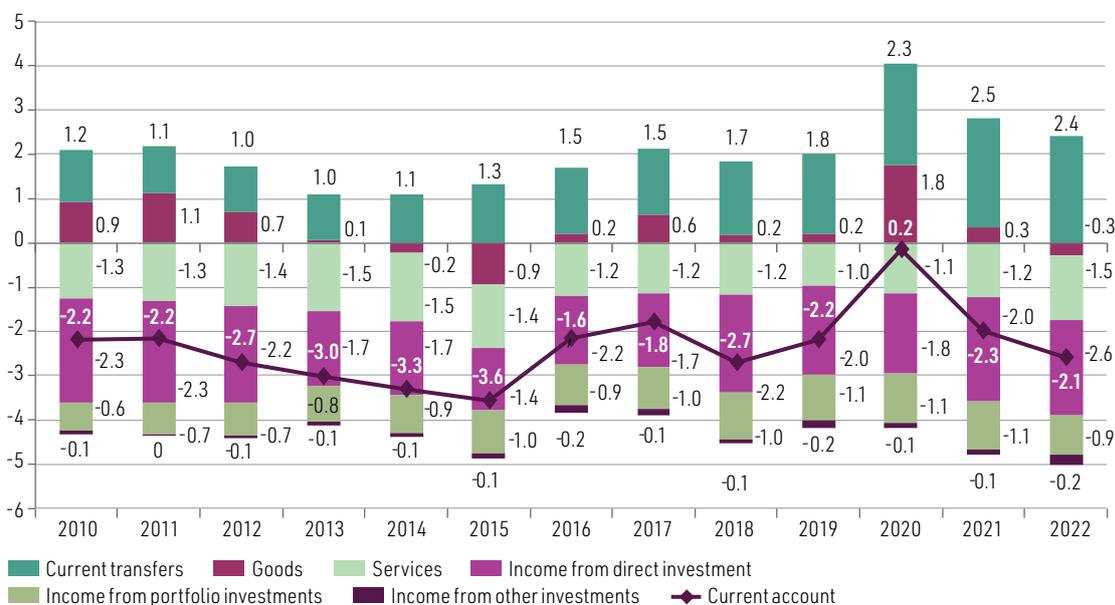
Note: The Bahamas, Barbados, the Bolivarian Republic of Venezuela, Haiti, Peru, Suriname and Trinidad and Tobago are not included because data for these countries are not available for 2022. Guyana is also excluded because the corresponding data for the calculation are not available.

¹ The average rate of return is calculated as the ratio of FDI income to FDI stock. Only the 10 countries for which 2022 FDI income data are available were used for the calculation.

The income generated by FDI stock is one of the components that negatively affect the current account of the balance of payments. The current account of the balance of payments of Latin America and the Caribbean has been in deficit since 2010. In 2022, the deficit stood at 2.6% of GDP and the income balance was the component with the largest deficit, as has historically been the case, at 3.3%. Within income, the deficit for FDI income amounted to 2.1% of GDP (see figure I.8), representing a smaller impact on the overall deficit than in 2021.

Figure I.8

Latin America and the Caribbean: balance-of-payments current account, by component, 2010–2022
(Percentages of GDP)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures.

2. Mergers and acquisitions: greater interest in investing in companies that operate in the region

Compared to 2021, cross-border mergers and acquisitions in Latin America and the Caribbean increased in 2022, both in number (to 327, up by 7%) and in value (to US\$ 30.147 billion, 57% higher). Despite this promising trend, the amount mobilized remains below pre-pandemic levels (see figure I.9).

Brazilian assets once again attracted the most interest from multinationals, as 31% of the deals completed in the region in 2022 took place in the country, representing growth of 18% with respect to the sluggish performance of 2021. Mexico ranks second with 29%, and is followed by Chile and Argentina (see figure I.10). In almost all of the countries, more deals were closed in 2022 than in 2021. The case of Jamaica is noteworthy as the country posted a ten-year record amount for transactions— US\$ 1.6 billion, linked to a sale in the telecommunications sector (see section I.B.4.a).

Figure I.9

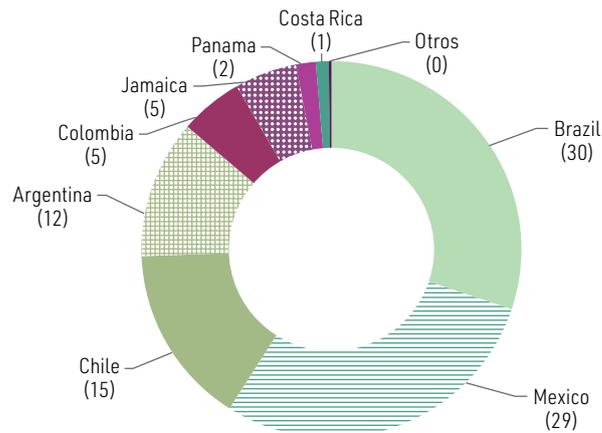
Latin America and the Caribbean: cross-border mergers and acquisitions, 2012–2022
(Millions of dollars and number)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

Figure I.10

Latin America and the Caribbean: cross-border mergers and acquisitions, by country of destination, 2022
(Percentages of the total amount)



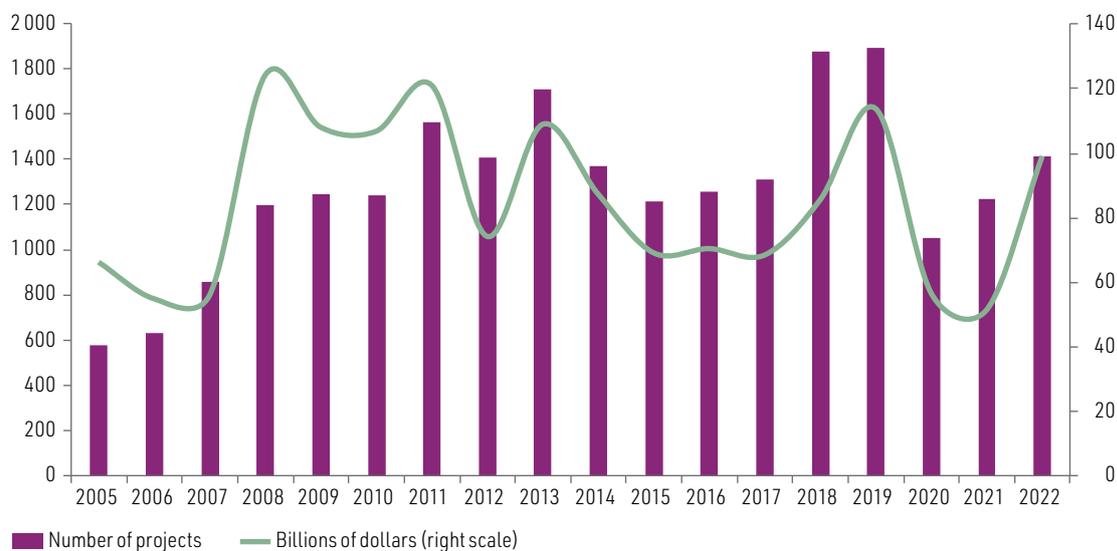
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

3. Announcements of FDI projects recovered, but not to the highs recorded prior to the COVID-19 pandemic

In 2022, announcements of new investment projects suggested an improved outlook for future investments. After falling in 2020 and 2021, the value of new FDI projects in the region increased by 92.5% in 2022, to close to US\$ 100 billion (see figure I.11). The number of announced projects also increased (by 15.3%), to 1,413. However, the number and value of announced projects both remained below the record levels seen in 2018 and 2019.

Figure I.11

Latin America and the Caribbean: FDI project announcements, 2005–2022
(Billions of dollars and number of projects)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] <https://www.fdimarkets.com/>.

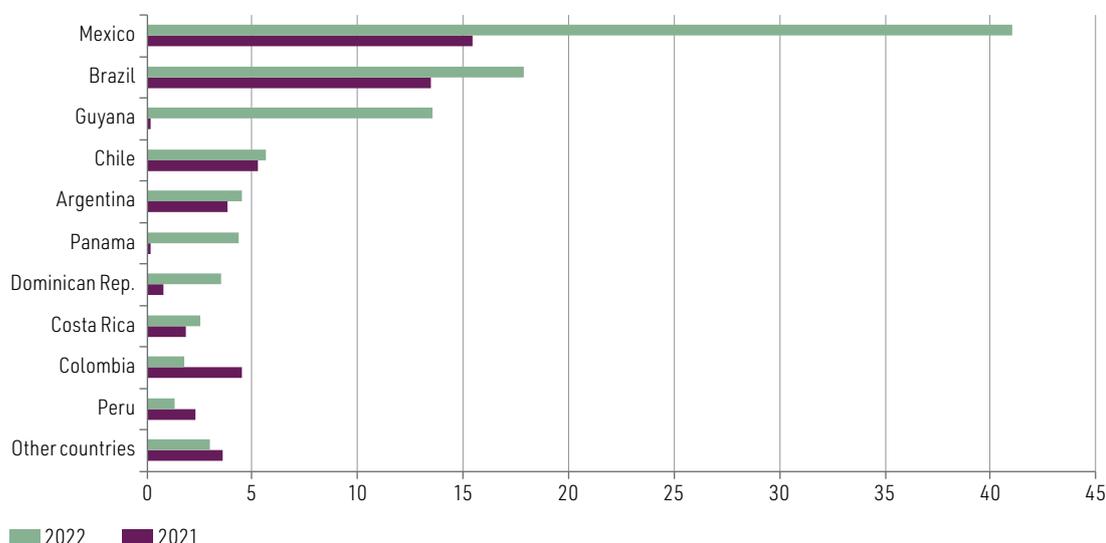
The value of the announced projects was primarily concentrated in large projects, essentially in the oil and gas, mining and renewable energy sectors. Fourteen projects had a value of at least US\$ 1 billion. These megaprojects accounted for 41% of the total investment, and 80% of the total amount of the announced projects came from the 170 largest projects. In the case of smaller projects, approximately two thirds of the 1,413 identified had a value of less than US\$ 20 million, and 98% of the projects did not exceed US\$ 400 million.

In 2022, the rise in FDI project announcements in Latin America and the Caribbean was mainly a result of a higher number of projects in Mexico, Brazil, Guyana and Panama (see figure I.12). The growth in Mexico (135%) contributed the most to the overall increase. Growth in announced investments in Guyana put the country in third place among the countries with the highest value announcements. This position is a result of hydrocarbon production in the country, which has led to announcements of large investments. In fact, six investment projects in Guyana were announced in 2022, including an oil exploration project announced by the United States company ExxonMobil for US\$ 10 billion. To give an idea of the size of these projects with respect to the country's economy, in 2021 Guyana had a GDP of US\$ 6.816 billion and a population of 800,000 (CEPALSTAT, 2021).

In South America, significant increases in FDI project announcements were recorded in Brazil (33%) and Argentina (18%). However, growth in the subregion was just 11%, well below that recorded in Central America and the Caribbean. The value of announcements declined in Colombia, Peru, Ecuador, the Plurinational State of Bolivia and Uruguay. Although the number of announcements in Colombia rose by 9% from 2021 to 2022, the amounts of the announcements fell by 60%. The number and amounts of announcements also declined sharply in the Plurinational State of Bolivia and Peru.

Figure I.12

Latin America and the Caribbean: FDI project announcements, main countries, 2021 and 2022
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] <https://www.fdimarkets.com/>.

4. FDI inflows by sector: services maintained its leading position and flows into natural resources and manufacturing recovered

One key to understanding how FDI may be contributing to sustainable development is analysis of which economic activities receive such capital, because some activities can have a greater impact on the diversification and technological sophistication of the countries of Latin America and the Caribbean, as well as on their energy transitions.

In this regard, use of the information offered by national accounts is limited. Firstly, few countries in the region report data by FDI destination (11 had such data in 2022). Secondly, the level of aggregation is high, meaning that it is only possible to determine whether investments were in services (generally in sectors such as financial services, electricity, gas and water, trade and ICT services), manufacturing (whose main sectors have traditionally been refining, the automotive industry, metallurgy, food and beverages, and the chemical industry) or natural resources (generally oil and gas or metal mining).

In this section, aggregate analysis of national accounts data is therefore accompanied by an analysis of cross-border mergers and acquisitions completed in 2022 and investment project announcements by foreign companies. Mergers and acquisitions are not necessarily reflected in capital inflows in the balance of payments, either because of business trends or because they are purchases of assets already owned by foreign companies, but they do allow for identification of the activities that attract most interest from international capital. Similarly, announcements of investment projects are indicators of interest from certain companies in expanding into the region, but they do not mean that the investments will be made and do not provide information on when the investment will be made.

With respect to FDI inflows, in 2022, services accounted for the largest share (54%), followed by manufacturing (30%) and natural resources (17%). Following the effects of the pandemic, which hurt investments in manufacturing and natural resources, all three sectors grew in 2022 (see figure I.13).

Figure I.13

Latin America and the Caribbean (12 countries): sectoral distribution of FDI inflows, 2010–2022
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as at 30 June 2023.

Note: The countries are Brazil, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Mexico and Plurinational State of Bolivia. These are the countries that have sectoral information for 2022. The information for Brazil does not include the reinvested earnings component. Sectoral data for Costa Rica and Mexico are computed using the approach of International Monetary Fund (IMF), *Balance of Payments and International Investment Position Manual: Fifth Edition (BPM5)*, Washington, D.C., 1993.

The lowest relative growth recorded was in investments in services (35%). Regardless, with this rate, services was the only sector above historical averages, and even the 2022 level was 10% higher than the previous peak reached in 2017. Growth in services was largely even across the region, with rises of 47% in Mexico, 32% in Brazil and 28% in the other countries, on average. In Mexico, there was unusual growth in investment as a result of a large merger in the film and video industry, which will be discussed later, and another in air transport. In Brazil, the most noteworthy growth was in non-financial holding companies and financial services, electricity and gas services, and ICT services.

Manufacturing investments, which followed a downward trend in previous years, grew by 47% relative to 2021, but remained below 2019 levels (17% lower). The long-term trend of declines in manufacturing investments, seen since 2013, did not reverse, with levels still below the peak reached in 2013 (50% lower). The highest rate of year-on-year growth was in Brazil (157%), but the country also recorded the most significant long-term decline in manufacturing investment (down from an average of US\$ 36.000 billion between 2010 and 2014 to US\$ 19.642 billion in 2022). In 2022, the largest inflows were in coke refining, petroleum derivatives and biofuels, and the automotive industry. Growth in Mexico was lower (9%), transport equipment manufacturing being the sector that attracted the most FDI, although for a smaller amount than in 2021; larger investments were made in base metal industries and the food industry. In both countries, inward FDI in manufacturing was below the average for 2010–2014. In the other countries analysed, manufacturing investments were smaller than in 2021.

Investment in natural resources, which has followed a downward trend since 2010, returned to growth (79%), in line with the average levels for 2015–2019. In fact, in percentage terms, it was the fastest growing sector in 2022. This was a result of an increase in investment in most countries, and above all in Brazil, where there was significant growth in inflows to oil and gas extraction. However, in

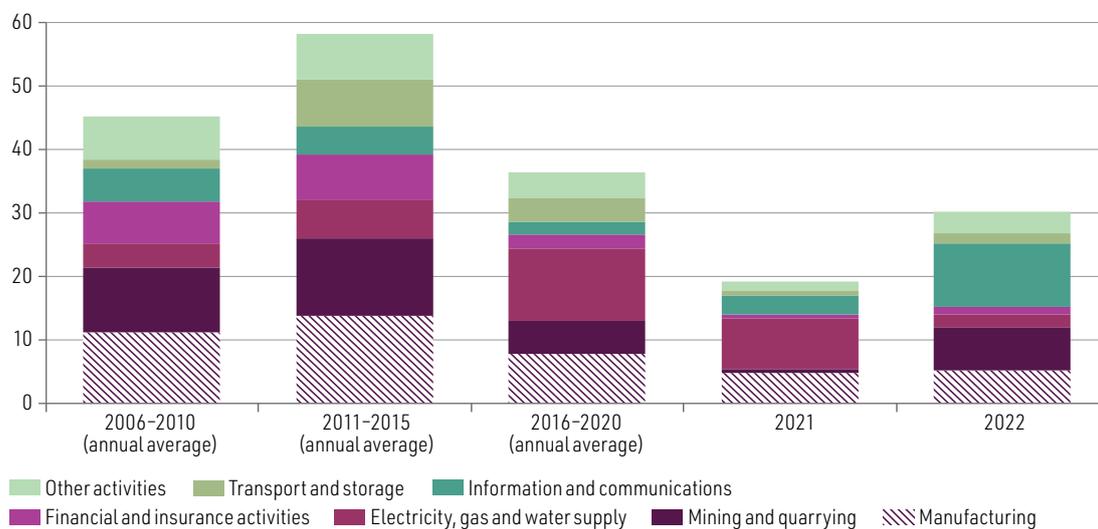
Mexico flows declined after more than doubling in 2021. Inflows into natural resources in Colombia also contributed to this growth (228%), as a result of larger investments in the oil and mining and quarrying sectors.

(a) Mergers and acquisitions: increased interest in natural resources and information and communications

Mergers and acquisitions in 2022 focused on three activities: information and communications (33% of total value), mining and quarrying (22%), and manufacturing (17%). This distribution by sector represents a change with respect to 2021 and previous years, in three main ways (see figure I.14). Firstly, the information and communications sector's share is the largest on record, owing to the merger between the Mexican company Televisa and the United States company Univision, for a total of US\$ 4.8 billion. The merger created TelevisaUnivision, the largest Spanish-language media group in the world (Televisa, 2022). Secondly, acquisitions of electricity, gas and water supply companies, which expanded significantly in prior years, declined in 2022. Lastly, the renewed interest in natural resources reached levels not seen since the first half of the 2010s.

Figure I.14

Latin America and the Caribbean: cross-border mergers and acquisitions, by sector, 2006–2022
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

In the information and communications sector, the merger between Mexico's Televisa Group and the United States' Univision, mentioned above, accounted for the growth. This transaction entailed record amounts for the sector, both regionally and for Mexico, highlighting growing interest from multinational media groups in the Latin American market (*El Economista*, 2022a; Televisa, 2022). The second largest transaction (see table I.3), in this case in the telecommunications sector, was the purchase from a Jamaican company of assets not physically located in the region. Australian telecommunications giant Telstra acquired the Digicel Pacific division of Jamaican company Digicel for US\$ 1.6 billion.²

² The Government of Australia financed the transaction through Export Finance Australia. Digicel Pacific is a division of the Jamaican company that operates in six South Pacific countries: Fiji, Nauru, Papua New Guinea, Samoa, Tonga and Vanuatu (Digicel Pacific, 2022; PRNewswire, 2022). The transaction is still subject to international arbitration in Singapore owing to a dispute over a tax imposed by Papua New Guinea.

Table I.3

Latin America and the Caribbean: 20 largest cross-border mergers and acquisitions, 2022

Company	Country of origin	Assets acquired	Percentages	Country of assets	Sector	Amount (Millions of dollars)
Univision Communications Inc.	United States	Grupo Televisa S.A.B.	31.15	Mexico	Information and communications	4 800
Telstra Corp. Ltd.	Australia	Digicel Pacific Ltd.	100	Jamaica	Telecommunications	1 600
Prosus NV	Netherlands (Kingdom of the)	iFood.com Agency Restaurants Online SA	33	Brazil	Computer programming, consultancy and related activities	1 505
South32 Ltd.	Australia	Sierra Gorda project	45	Chile	Mining and quarrying support service activities	1 550
Mondelez International Inc.	United States	Ricolino SA de CV	100	Mexico	Manufacture of food products	1 300
Indorama Ventures Public Company Limited	Thailand	Oxiteno SA Industria e Comercio	100	Brazil	Manufacture of chemicals and chemical products	1 300
SoFi Technologies Inc.	United States	Technisys SA	100	Argentina	Computer programming, consultancy and related activities	1 100
Westrock Co	United States	Grupo Gondi SA de CV	68	Mexico	Manufacture of paper and paper products	970
Ganfeng Lithium Group Co Ltd.	China	LitheA Inc	100	Argentina	Mining of metal ores	962
Phoenix Tower International LLC	United States	Portfolio of 3,800 telecommunication sites in Chile	100	Chile	Telecommunications	930
Grupo Energía Bogotá SA ESP, Argo Energia Empreendimentos e Participações SA	Colombia	Quantum Participações SA	50	Brazil	Electricity, gas and water supply	836
Rio Tinto PLC	Australia	Rincón lithium project	100	Argentina	Mining and quarrying (lithium)	825
Equinix Inc	United States	Four data centres owned by Empresa Nacional de Telecomunicaciones (Entel)	100	Chile and Peru	Data centres	735
Innergex Renewable Energy Inc	Canada	Aela Generación S.A. Aela Energia SpA	100	Chile	Renewable energies	691
Darling Ingredients Inc	United States	Fasa America Latina Participações Societarias S/A	100	Brazil	Agriculture, livestock, forestry and fisheries	541
Inversiones Cachagua SpA	United States	AES Andes SA	31.16	Chile	Electricity, gas and water supply	522
Lundin Mining Corp	Canada	Josemaria Resources Inc	100	Argentina	Mining and quarrying (copper)	497
Aena	Spain	11 Brazilian airports	100	Brazil	Transport and storage	471
EuroChem	Switzerland	Phosphate projects in Serra do Salitre	100	Brazil	Mining and quarrying	452
Lukoil	Russian Federation (the)	Area 4 offshore project in Mexico	50	Mexico	Extraction of crude oil and natural gas	435

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

The Chilean telecommunications market also displayed buoyant growth in 2022, as local and cross-border deals reflected restructuring and portfolio optimization by companies in the sector. In addition to transactions among domestic companies (such as the merger of VTR and Claro), 3,800 telecommunications towers owned by the company WOM were sold to the United States' Phoenix Tower International. The assets were sold to increase the efficiency of WOM's operations,

and the transaction will be finalized in 2024, making the United States company the largest owner of communication towers in Chile (*El Economista*, 2022b; *La Tercera*, 2022). Another key event in the Andean country's telecommunications sector was the recent sale of four data centres belonging to the Chilean telecommunications company Entel (three in Chile and one in Peru) to the United States company Equinix. This strategic sale allows Entel to redirect its resources and services to a more efficient portfolio, while enabling Equinix to expand its global presence, especially in the four-country Pacific Alliance trade bloc (Entel, 2022).

Interest in natural resource exploitation in the region remained strong, and 4 of the 20 largest operations of the year were related to this activity (see table I.3). The biggest was the acquisition by Australia-based South32 Limited of an interest in the Sierra Gorda SCM copper and molybdenum mining company in Chile from Sumitomo Metal Mining of Japan and its parent company, Sumitomo Corporation. Following the transaction, South32 holds a 45% stake in the company, while KGHM Polska Miedz S.A. of Poland retains a 55% stake. The transaction represents a strategic review of the Japanese group's portfolio, as well as South32's first foray into Chile. Prior to this transaction, South32 was already operating in Brazil and Colombia, so this new acquisition represents a significant expansion of its presence in Latin America (SGSCM, 2022; LexLatin, 2021).

The exploration and production of lithium and its compounds accounted for two other significant operations in Argentina. The larger of these operations was the acquisition of the Argentine company LitheA Inc. by China-based Ganfeng Lithium Group. The goal of Ganfeng, the largest producer of lithium compounds in China and a key supplier to Tesla, the United States-based electric vehicle producer, is to access lithium reserves in Salta Province to produce essential battery materials (Reuters, 2021). In the same region, the Australia-based mining company Rio Tinto acquired the Rincon Mining lithium exploration project. According to the company, the project is expected to be long-term and low-carbon, thanks to an innovative technology applied by Rio Tinto to extract the metal, which has the potential to increase its recovery yield. A pilot plant is already operating in the region, and the company plans to invest approximately US\$ 100 million over the next two years to further explore the project's potential, with a further US\$ 1 billion planned for the construction of a commercial plant (Government of the Province of Salta, 2022; Rio Tinto, 2022).

In mining and quarrying (although some manufacturing activities are included), the fertilizer company EuroChem, of the Russian Federation and Switzerland, has bought a phosphate mine and a processing plant for the production of fertilizers located in the State of Minas Gerais, Brazil, from the Norway-based company Yara. The project, called "Serra do Salitre", comprises an open-pit mine and a plant at an advanced stage of development. EuroChem plans to invest an additional US\$ 450 million to complete the project, which includes the construction of a sulfuric acid plant and a phosphoric acid plant, along with a storage facility for granular fertilizers, among other products. The project is expected to be fully operational in 2024, taking advantage of the record price hikes in the fertilizer market as a result of sanctions imposed on Belarus and the Russian Federation, which are major producers, owing to their involvement in the conflict with Ukraine since early 2022. The acquisition is part of EuroChem's growth strategy in South America, given the agricultural importance of the region (Baffes and Chian Koh, 2023; EuroChem, 2022; Yara, 2021).

Three subsectors of the manufacturing sector stood out: the chemical industry (30% of total mergers and acquisitions in the industrial sector), the food industry (29%) and paper and paper product manufacturing (26%). A notable transaction in the chemical industry is the sale of 100% of the assets of the Brazil-based petrochemical company Oxiten, belonging to Ultrapar Participações, to Indorama Ventures of Thailand, allowing the company to consolidate its position as the leading producer of surfactants in the Americas (Oxiten, 2022). In the food industry, the United States-based giant Mondelez International acquired the assets of Mexico's Ricolino from Grupo Bimbo, also of Mexico, thus acquiring not only two brands with a strong presence in the Mexican market, but also six plants and the distribution chain, and doubling the size of its operations in the Mexican market (Noguez, 2022a).

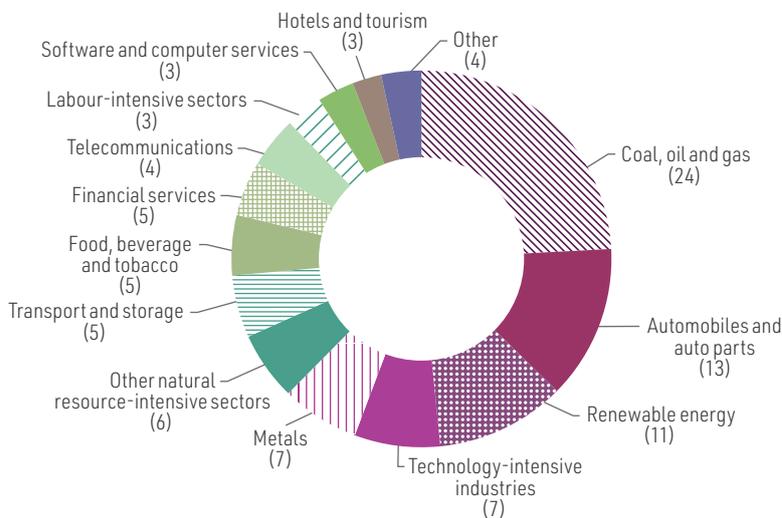
In paper and paper product manufacturing, United States-based WestRock acquired the remaining 67.7% of the share capital of Grupo Gondi, the Mexican paper, corrugated cardboard and high graphics company. The operation includes four paper mills, nine corrugated packaging plants and six high graphic plants in Mexico (WestRock, 2022). The United States-based company had already begun establishing a joint venture with the Mexican group in 2015, when it bought 32.3% of the company's shares (LexLatin, 2023).

(b) FDI project announcements: hydrocarbon and automotive sectors outperform renewable energy

The breakdown of FDI announcements by sector also changed with respect to 2021 and previous years. For the first time since 2010, coal, oil and gas project announcements accounted for the largest share, at 24% of the total amount, growing more than ninefold on the prior year (see figure I.15). There was also significant interest in the automotive and auto parts, renewable energy and technology-intensive industries, which together accounted for more than one third of the announced amount of investment. The telecommunications sector, which was the leading sector in terms of announcements in 2021, experienced a significant decline (52%), ending the growth trend of the previous year.

Figure I.15

Latin America and the Caribbean: FDI project announcements, by sector, 2022
(Percentages of the total amount)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] <https://www.fdimarkets.com/>.

Two energy sectors —coal, oil and gas and renewable energy— became more important in 2022 owing to higher global energy prices, and also to the ongoing energy transition efforts (for a detailed analysis of FDI in energy in the region, see chapters II and III). The growth in coal, oil and gas mainly came from large projects announced in Guyana and Mexico, which together totalled over US\$ 22 billion and accounted for 93% of the total for projects in the sector. The renewable energy sector ranked third, with an amount close to US\$ 11 billion and 40% growth on the previous year. However, the sector remains well below the levels seen in 2019, when renewable energy projects totalled more than US\$ 20 billion.

The largest renewable energy project was announced by the United States company SGP BioEnergy in Panama, with investments for an amount of US\$ 2.473 billion in the Ciudad Dorada biorefinery. The project, a partnership with Panama Oil Terminals and the Government of Panama, will have

a production capacity of 180,000 barrels per day, making it the largest aviation biofuel production platform in the world (Ministry of Trade and Industry, 2022). The second largest announcement was that by InterEnergy of the United Kingdom, through Consorcio Energético Punta Cana-Macao (CEPM), a US\$1 billion project for wind and solar generation in the Dominican Republic.

In addition to the coal, oil and gas sector, other extractive sectors grew significantly in 2022. These included metals (134%), minerals (1,174%) and other natural-resource-intensive products (138%). Of note is the minerals sector, which underwent a record decline in 2020 to announcements for a total of US\$ 4 million, but whose announcements amounted to close to US\$ 840 million in 2022 (1% of the total). Interest from multinational companies in extracting lithium in Argentina is behind these announcements. For instance, the United States company Livent announced an investment of US\$ 510 million to expand its lithium operation in Argentina and the China-based corporation Zijin Mining Group announced it will invest US\$ 380 million in its lithium operation in the country.

In the automotive and auto parts sectors, the main announcement came from Tesla Motors, the United States producer of electric vehicles, which announced a new plant in Monterrey, Mexico, to manufacture new generation vehicles, with an expected investment of US\$ 5 billion and creation of 7,000 direct jobs. When selecting the location, the company favoured proximity to the United States and the pre-existing value chains there (Bloomberg Línea, 2023). Construction of the Tesla plant may drive new investment from specialized suppliers. For example, the AGP Group, which specializes in glazing, announced that it will invest US\$ 800 million in Santa Catarina, Mexico (Vanguardia, 2023).

Technology-intensive industries ranked fourth, with 7% of the total amount of the announced projects. The largest announcements were in the industrial equipment, electronic components, consumer electronics and aerospace sectors. Mexico was the main recipient of investment in high-tech industries, accounting for 78% of projects in industrial equipment, 93% of electronic components, 80% of consumer equipment, 89% of aerospace and 93% of semiconductors. One key project was that of the Chinese solar panel manufacturer Solarever, which already operated in Mexico and announced a US\$ 1 billion investment in the State of Jalisco to manufacture batteries for electric cars. Meanwhile, Costa Rica was the main destination for medical equipment, attracting 52% of the total announced amount. The two countries have existing manufacturing capacity for these industries, which has led to growing interest among international investors.

The aerospace and semiconductor sectors grew considerably from 2021 to 2022. In aerospace, the investment projects announced in the States of Chihuahua, Querétaro and Jalisco in Mexico accounted for 89% of the total projected amount for the sector, or US\$ 829 million. The only aerospace project announced outside Mexico was in Brazil, for an amount of US\$ 94 million. The United States company Jabil, which already has large facilities in Mexico, announced a US\$ 400 million investment in the semiconductor sector in Jalisco.

5. FDI by country of origin: the United States and the European Union are still the main investors in the region

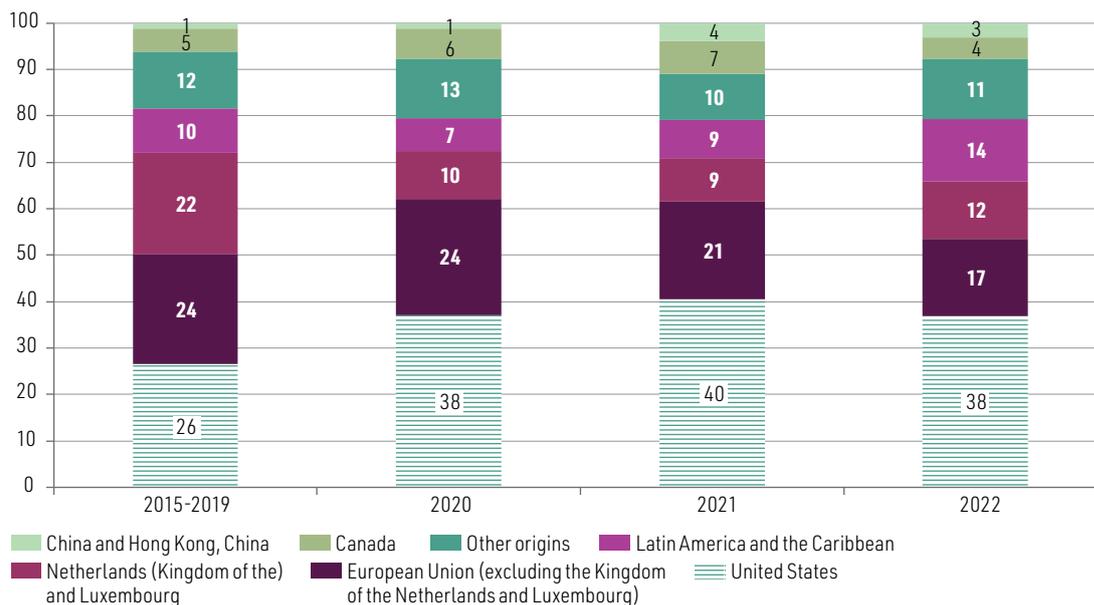
The origin of FDI can be identified only imprecisely through national accounts statistics, as they record the immediate origin of the capital and not the ultimate origin of the company making the investment. As a result, investments made from Luxembourg or the Kingdom of the Netherlands—which are often selected by multinational companies to invest in third countries owing to their tax systems—are frequently overrepresented. Therefore, national accounts data have been supplemented with data on mergers and acquisitions and investment project announcements.

An analysis of the nine countries that reported the origin of FDI inflows in 2022 reveals that the United States and the European Union remained the main investors, but with some changes in their respective shares. The United States retained its position as the region's main investor (38% of the

total), with growth of 34% in FDI inflows with respect to 2021 (see figure I.16). These investments were mainly in Mexico (46%) and Brazil (31%). United States investments in Colombia grew substantially, by 220%, making the country the third largest recipient of United States investment in Latin America.

Figure I.16

Latin America and the Caribbean (11 countries):^a distribution of FDI inflows, by origin, 2015–2022
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as at 30 June 2023.

^a The countries are Brazil, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Plurinational State of Bolivia and Trinidad and Tobago which have sector-level data for 2022. The information for Brazil does not include the reinvested earnings component. Sectoral data for Costa Rica and Mexico are computed using the approach of International Monetary Fund (IMF), *Balance of Payments and International Investment Position Manual: Fifth Edition (BPM5)*, Washington, D.C., 1993.

The share of the United States and the European Union (excluding the Kingdom of the Netherlands and Luxembourg) declined, because of strong growth in investment from Latin America and the Caribbean and the Kingdom of the Netherlands and Luxembourg. Investments from the European Union (excluding the Kingdom of the Netherlands and Luxembourg) grew by 20%, while growth for the Kingdom of the Netherlands and Luxembourg was 101%.

Investment originating from Latin America and the Caribbean grew by 136% in 2022. Growth in investment from Chile, Argentina, Uruguay and Panama contributed 81 percentage points of the growth. Brazil, Colombia and Mexico were the main destinations for investments originating from Latin America and the Caribbean, at 34%, 24% and 20% of the total, respectively. In the case of Colombia, 51% of investments from the region originated from Panama, where intermediary investment companies operate, investing capital whose ultimate origin is not identifiable. In Brazil, the main Latin American and Caribbean investors were Chile, Uruguay and the Bahamas, which invested 56%, 18% and 11% of the total, respectively. The Bahamas and Uruguay are also markets where financial intermediation companies play a prominent role in cross-border capital movements. Given that these countries with capital in transit account for a large share of investments, by countries of origin, in Latin America and the Caribbean, it is not immediately clear whether the growth in the share of intraregional investment is a reflection of activity by companies from the region. However, as examined in section I.C, capital outflows from the region reached record levels. The investment from Chile in Brazil, at US\$ 3.066 billion, is likely related to the investment of Celulosa Arauco y

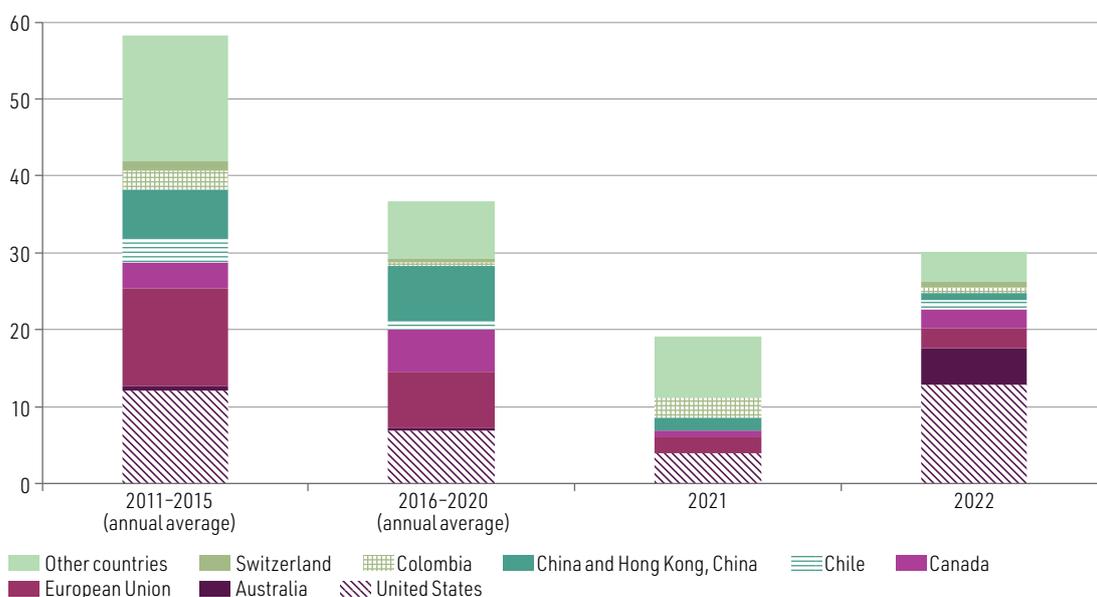
Constitución (see section I.C). Investments originating from the region also grew significantly in Ecuador (303%) and the Dominican Republic (115%), owing mainly to investments originating from Uruguay and Mexico, respectively.

(a) Mergers and acquisitions: lower amounts from China and the European Union

In terms of countries of origin of the multinational companies that have acquired assets in the region, the share in total investment of firms from the United States increased in 2022 to 43%, compared to an average since 2011 of 20% (see figure I.17). They were followed, in order, by companies from Australia (16%), the European Union (9%) and Canada (8%). This marked a striking drop in the total amount of acquisitions from European Union companies, which between 2011 and 2020 had accounted for 21% of the total, as well as from China and Hong Kong, China, which accounted for 14% of the total in the same period. In fact, 2022 was the year with the lowest monetary amount for Chinese acquisitions in the region since 2013 and the fewest deals since 2011. In the case of companies from the European Union, the number of deals recovered (56 compared to 43 in 2021), but remains below the average for previous years (81 per year between 2011 and 2019).

Figure I.17

Latin America and the Caribbean: cross-border mergers and acquisitions, by country or region of origin, 2011–2015, 2016–2020, 2021 and 2022
(Billions of dollars)



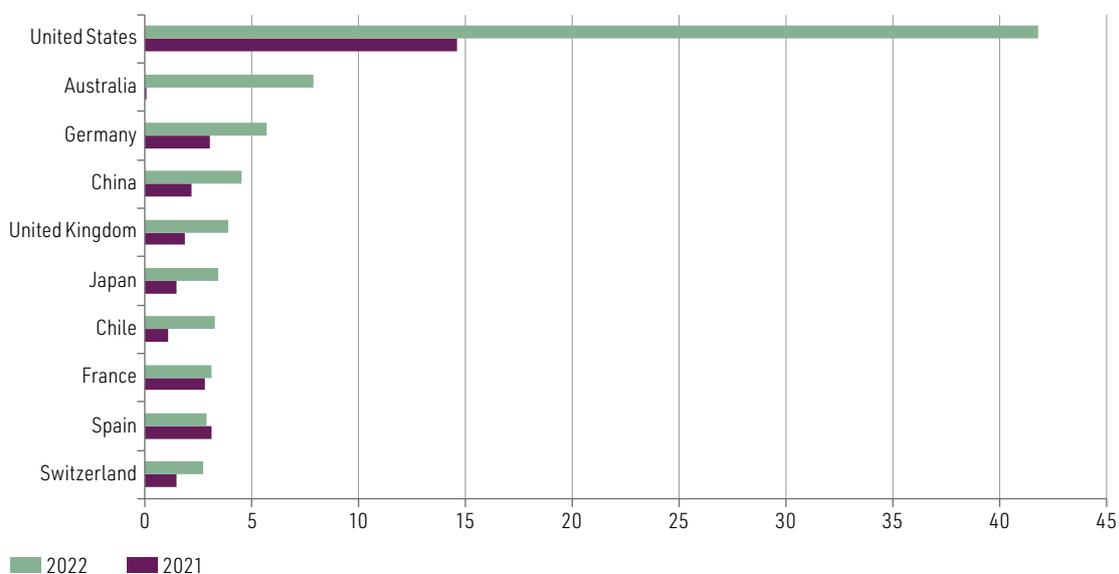
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

(b) FDI project announcements: megaprojects drove changes

In 2022, announced investments originating from the United States and Australia grew considerably in terms of value (see figure I.18). The United States remained in the leading position, with a share of 38% of the total (a rise of 186% on 2021). The most noteworthy projects originating from the United States include oil extraction projects in Guyana and automotive industry projects in Mexico. In addition to the importance of the coal, oil and gas sector (39% of the announced amount for the country), automobiles and auto parts (16%) and renewable energies (10%) stood out, with significant growth in announcements in the energy sector (renewable and non-renewable).

Figure I.18

Latin America and the Caribbean: FDI project announcements, by country of origin, 2021 and 2022
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] <https://www.fdimarkets.com/>.

With fewer announcements, Australia ranked second, with 8% of the total amount. The main investments in the region announced by Australian companies focused on coal, oil and gas in Mexico, metals in Chile and renewable energy in Brazil. The largest project was announced by Woodside in Mexico, originating from a partnership with PEMEX to explore the Trion offshore oil project in the deepwater Gulf of Mexico, estimated at US\$ 4.500 billion (BHP, 2022; Reuters, 2023). The Australian group BHP announced investments of US\$ 2.460 billion in copper extraction in Chile. In the past, Australian investments in the region have centred on minerals, oil and gas. In fact, Australia's third largest investment in 2022 in the renewable energy sector in Brazil was related to the mining sector. Macquarie Asset Management's US\$ 700 million project is for a wind and solar power plant in north-eastern Brazil (Piauí and Pernambuco), and the generated energy will be supplied to a bauxite mine and for aluminium production in the Amazon region of the State of Pará. These extractive investments generally focus on the respective traditional sectors of national economies; they do not constitute structural changes, but rather a deepening of existing extractive production structures.

Announced investments by European Union companies recovered slightly in 2022 (7%), but failed to return to pre-pandemic levels (see figure I.19). The rise came from growth in announcements from Germany (86%) and France (11%), despite a decline in those from Spain (7%). Announcements by Spanish companies in Latin America and the Caribbean, which used to rank second in the region, have not yet returned to pre-pandemic levels. Over the 10 years prior to the pandemic, Spain accounted for an average of 12% of announcements in the region, while in 2022 it accounted for just 3%. By contrast, announced investments from China and Hong Kong, China maintained the level seen in the past, accounting for around 5% of the total value. In 2019, announced Chinese investments in the region reached a record high (11% of the total), but after the pandemic they did not return to those levels.

Figure I.19

Latin America and the Caribbean: announced FDI projects from selected countries or regions, 2005–2022
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, FDI Markets [online database] <https://www.fdimarkets.com/>.

C. FDI outflows from Latin America and the Caribbean: outward investment hit record highs

In 2022, the amount invested abroad by trans-Latin companies jumped by 80% compared to the previous year, to a record US\$ 74.677 billion. This figure is the highest since the series was first compiled in the 1990s, and over US\$ 30 billion more than the amount invested in 2021 (see table I.4). The growth came mainly from significant increases in outward investment from Brazil and Mexico, and this trend is partly a consequence of investments announced in 2019 being postponed because of the COVID-19 pandemic.

Table I.4

Latin America and the Caribbean (selected countries): outward FDI, 2013–2017 and 2018–2022
(Millions of dollars and percentage rates of change)

	2013–2017 (Annual average)	2018	2019	2020	2021	2022	Absolute change 2020–2021 (Amounts)	Relative change 2021–2022 (Percentages)	Share of total regional FDI, 2022 (Percentages)
Argentina	1 326	1 726	1 523	1 177	1 537	2 076	540	35.1	2.8
Brazil	15 084	2 025	22 820	-3 467	16 239	30 694	14 455	89.0	41.1
Chile	9 133	1 847	10 345	6 398	13 946	12 776	-1 171	-8.4	17.1
Colombia	4 795	5 126	3 153	1 733	3 181	3 402	221	6.9	4.6
Mexico	9 112	12 121	5 969	5 578	401	17 371	16 970	4 231.8	23.3
Uruguay	1 542	2 456	79	-491	1 893	6 051	4 158	219.6	8.1
Other countries	2 676	560	1 737	-278	4 283	2 307	-1 976	-46.0	3.1
Latin America and the Caribbean	43 667	25 860	45 626	10 651	41 481	74 677	33 196	80.0	100

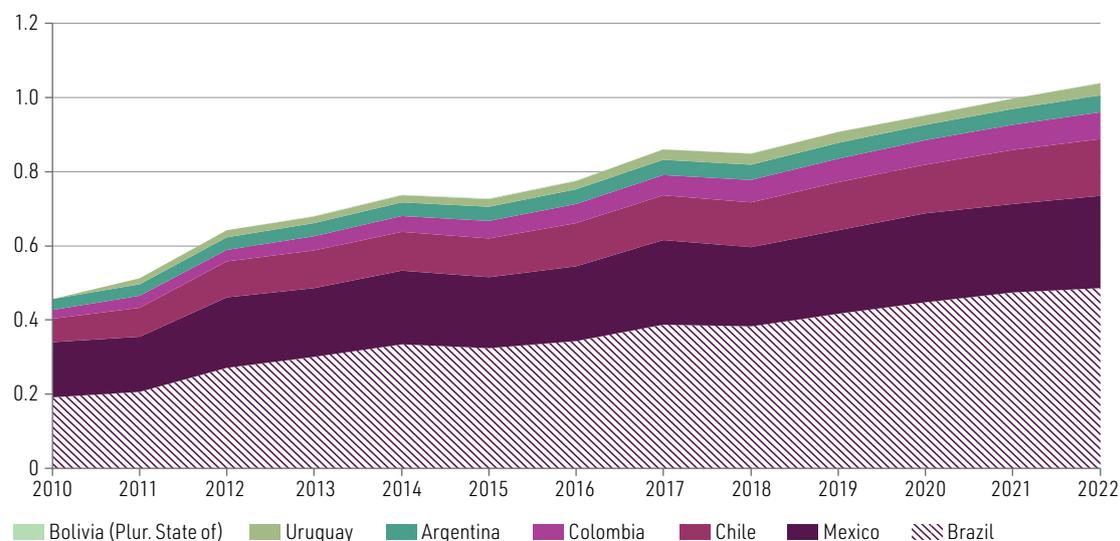
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as at 30 June 2023.

In 2022, outward FDI by Brazilian companies topped US\$ 30 billion for the first time since 2013, accounting for 41.1% of the region's total. In the case of Mexico, the increase was substantial, as outward FDI rose from a particularly low level in 2021 to US\$ 17.371 billion in 2022. Investments by Mexican companies therefore accounted for 23.3% of total Latin American and Caribbean investments abroad. In the case of Chile, although outward foreign investments declined by 8% in 2022, they were still above the average for the preceding decade and the country remains the third leading source of outward FDI from the region, with 17% of the total in 2022. Although Uruguay appears as a significant source of investment in 2022, it sometimes operates as a transit country for capital, so the ultimate owner of companies may be registered in another country (Uruguay XXI, 2022). Therefore, the figure attributed to the country does not necessarily reflect the activity of Uruguayan companies investing abroad. There was also growth in outward investments by Argentine multinationals (35%), with levels much higher than those recorded over the preceding decade.

In 2022, the stock of investments of trans-Latin companies abroad grew by 4% to US\$ 1.06 trillion. Brazil and Mexico were the countries with the largest shares, at 46% and 23%, respectively (see figure I.20), and were followed by Chile, which accounted for 14%. The country with the strongest growth in its share of the investment stock was Uruguay, at 22%, continuing the trend of high growth in outward FDI reported by the country in 2022.

Figure I.20

Latin America and the Caribbean (7 countries):^a stock of outward FDI, 2010–2022
(Trillions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as at 30 June 2023.

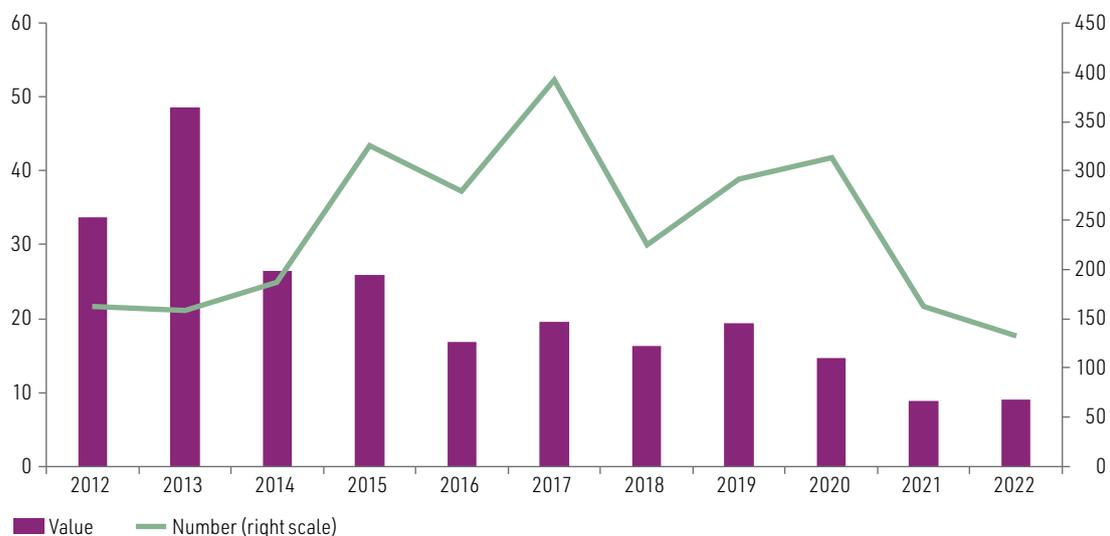
^a The countries included are those for which information is available up to 2022.

As in previous editions of this report, to better capture the behaviour of multinational corporations in the region, the information from national accounts must be complemented by unofficial data sources, with a view to understanding the specific patterns in some foreign investments. In terms of Latin American companies acquiring assets in other countries in the region, 2022 saw the lowest number of mergers and acquisitions in a decade (including the duration of the COVID-19 pandemic), with 133 deals completed, 18% less than the prior year. However, despite this drop, the total value of the deals was 2% higher, at US\$ 9.095 billion (see figure I.21).

Figure I.21

Latin America and the Caribbean: cross-border mergers and acquisitions by trans-Latin companies, 2012–2022

(Billions of dollars and number)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

The largest deal by trans-Latin companies in 2022 involved the sector related to public services and more specifically to renewable energy, which accounts for the second largest proportion of such transactions (26% of the total). Actis, a United Kingdom investment fund specializing in sustainable infrastructure, sold 100% of the assets of Echoenergia, Brazil's largest independent renewable energy platform, to the Brazilian public service company Equatorial Energia. Valued at around US\$ 1.200 billion, the transaction is considered the largest ever recorded in the renewable energy sector in Brazil (Actis, 2022; Norton Rose Fulbright, 2021)³ (see table I.5).

Table I.5

Latin America and the Caribbean: 10 largest cross-border mergers and acquisitions by trans-Latin companies, 2022

Company	Country of origin	Assets acquired	Percentage	Country of assets	Sector	Amount (Millions of dollars)
Equatorial Energia SA	Brazil	Echoenergia Participações SA	100	Brazil	Renewable energies	1 254
Compañía Siderúrgica Nacional (CSN)	Brazil	CSN Cimentos Brasil SA	100	Brazil	Cements and aggregates	1 025
Grupo Energia Bogotá SA ESP, Argo Energia Empreendimentos e Participações SA	Colombia	Quantum Participações SA	50	Brazil	Electricity, gas and water supply	836
Cencosud SA	Chile	The Fresh Market Holdings Inc	67	United States	Retail trade	676

³ This is the third divestment by Actis in Latin America and the Caribbean in the last two years: in 2021 it sold the assets of Saavi Energía in Mexico to Global Infrastructure Partners and in 2022 it participated in the sale of Aela Energía, in Chile, to Innergex Renewable Energy (Actis, 2022).

Company	Country of origin	Assets acquired	Percentage	Country of assets	Sector	Amount (Millions of dollars)
Alpek SAB de CV	Mexico	Octal Holding & Co Saoc	100	Oman and the United States	Chemical industry	620
Petróleos Mexicanos (PEMEX)	Mexico	Deer Park Refining LP	50	Mexico	Oil, coal and natural gas ^a	596
Cosan SA	Brazil	Petrochoice Holdings Inc	100	United States	Oil, coal and natural gas ^b	479
Itaú CorpBanca Chile SA	Chile	Itaú CorpBanca Colombia SA	33	Colombia	Financial services	414
Infraestrutura Brasil Holding XVII SA	Brazil	Contour Global do Brasil Participações SA	100	Brazil	Electricity, gas and water supply	320
Empresas CMPC SA	Chile	Carta Fabril SA	33	Brazil	Manufacture of paper and paper products	241

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

^a Transport and storage of crude oil and natural gas (midstream).

^b Refining or processing of crude oil and natural gas, distribution, sale and final use (downstream).

Also in the public services sector, Grupo Energía Bogotá (GEB) and its Brazilian subsidiary Argo Energia Empreendimentos e Participações S.A. have acquired the assets of Quantum Participações, which belonged to the Brookfield group. The transaction covers five electricity transmission concessions in Brazil and was valued at US\$ 836 million, doubling the Colombian group's presence in the country, with an emphasis on the north-east region, which has high potential for renewable energy generation (AméricaEconomía, 2022a; Semana, 2022).

Analysis by sector of mergers and acquisitions by trans-Latin companies shows that the manufacturing industry is the top target for acquisitions by multinational companies in the region, with a 38% share of total transactions in 2022. The main subsector was cement production, driven by the acquisition of CSN Cimentos Brasil SA, owned by Swiss giant LafargeHolcim, by Brazilian steelmaker Companhia Siderúrgica Nacional (CSN).

In the industrial sector, there were two transactions linked to the petrochemical industry that are worth highlighting. Mexican company Alpek, which specializes in industrial resins and polyethylene terephthalate (PET) products, has acquired 100% of the assets of Octal Holding & Co Saoc, including a recycling centre in the United States and resin and thermoform packaging plants in Oman and Saudi Arabia. The deal not only increases the Mexican company's geographic coverage and capacity, but also forms part of its sustainability strategy, by expanding use of low-carbon technologies and addressing customers' recycling needs (Mundo PMMI, 2022).

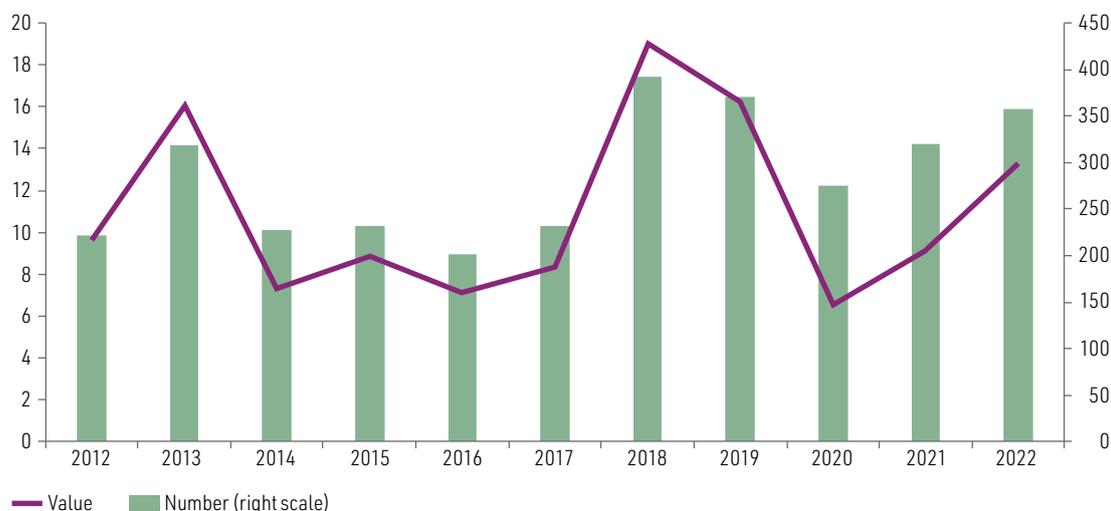
In terms of foreign investment projects announced by trans-Latin companies, the amount of investment announced grew by 46% compared to 2021. The quantity and value of the announcements are still below pre-pandemic levels, although there is a positive trend in the number of announcements over time and stability in average investment values (see figure I.22).

In terms of the distribution by sector of the foreign investment projects announced by companies from the region, natural-resource-intensive industries stand out, accounting for 27% of the total investment amount announced in 2022. This high proportion is primarily a result of plans by the Chilean company Celulosa Arauco y Constitución to invest US\$ 3.000 billion in construction of a pulp mill in Mato Grosso do Sul (Brazil). The plant is expected to start operating in 2025 and create 3,000 direct jobs (Arauco Brasil, 2022) (see figure I.23).

Figure I.22

Latin America and the Caribbean: foreign investment projects announced by trans-Latin companies, 2012–2022

(Billions of dollars and number)

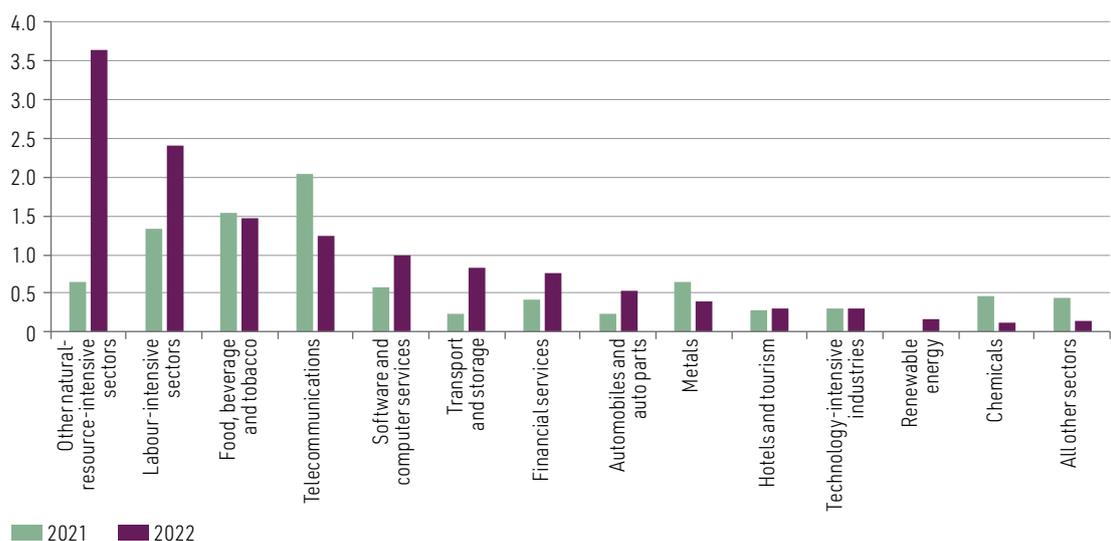


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] <https://www.fdimarkets.com/>.

Figure I.23

FDI project announcements by trans-Latin companies, by sector, 2021 and 2022

(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] <https://www.fdimarkets.com/>.

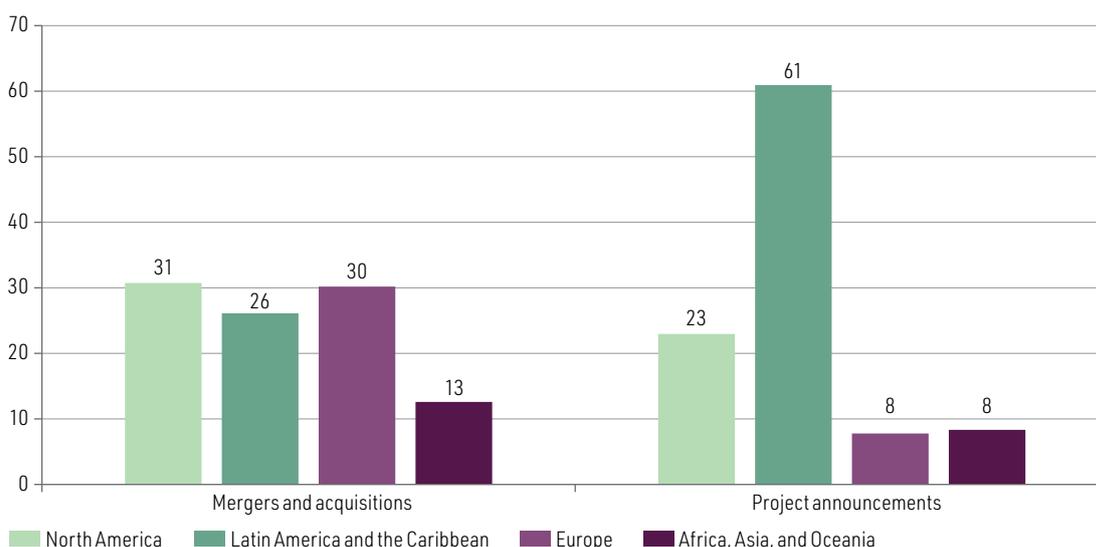
Announcements in labour-intensive industries, divided into the consumer products, construction materials and textile sectors, also grew considerably. The second largest announced project in 2022 was in the construction materials sector, by Grupo Cementos de Chihuahua (GCC), a Mexican company that plans to expand its cement production in the State of Texas (United States), with an investment of US\$ 750 million.

The amount of investment in telecommunications, which was the most important sector in 2021, declined by 39% in 2022. Nonetheless, the sector had the third largest announced project in the region, that planned by Claro Costa Rica, a subsidiary of Mexico's América Móvil. The project is to expand a submarine cable connecting several countries in the region, for a total amount of US\$ 500 million throughout Latin America (DPL News, 2022).

The top destination for foreign investment from countries of Latin America and the Caribbean —driven by investment announcements from trans-Latin companies— is the region itself, as it accounts for 61% of the value of announced projects, followed by North America (23%). The picture is different for mergers and acquisitions, however, with North American assets attracting the most trans-Latin companies (31%), followed by Europe (30%) and then Latin America and the Caribbean (26%) (see figure I.24).

Figure I.24

Latin America and the Caribbean: mergers and acquisitions and project announcements by trans-Latin companies, by target region, 2022
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Financial Times, fDi Markets [online database] <https://www.fdimarkets.com/> and Bloomberg.

D. Policies to attract investment

One of the main reasons given for using public resources to attract investment is the potential of FDI to drive production linkages and transfers of knowledge and technology, and thus support economic growth (ECLAC, 2010). In broader terms, investment flows can also contribute to sustainable development by favouring inclusion, creation of quality jobs and environmental conservation, in addition to driving innovation and increasing productivity and competitiveness, among other effects. However, these potential benefits do not occur automatically or spontaneously, but depend on an appropriate context and stimulus measures.

Over the past few decades, attention has increasingly been paid to how to focus public policies and institutions to effectively attract quality FDI. Quality FDI can be understood as that which drives increased productivity, innovation and incorporation of new technology, and is oriented towards sustained, inclusive and sustainable economic growth (ECLAC, 2020). In other words, FDI contributes

to capacity-building in the recipient country, for example, in terms of creation of quality jobs and formation of production linkages, or research and development, innovation and technologies. If FDI and the policies to attract it form part of a national development plan, their quality can be assessed in terms of the impact that FDI can have on fulfilment of the plan's main objectives.

The interest in attracting this type of foreign capital has been reflected in an international tendency to adopt more sophisticated policy frameworks that are integrated into a vision for the future and coordinated with other policies that enable progress towards the specific development priorities of each area. This involves the efficient combination of different measures and instruments, including the design and implementation of different financial and fiscal incentives, and the development of mechanisms to mitigate the risk of investment projects and facilitate access to financing. This can be done, for example, by establishing legal, regulatory and policy frameworks that foster the credibility, predictability and confidence needed to attract private sector investment. More complex policy has been accompanied by construction of more robust institutional frameworks for FDI, with most countries in the world establishing agencies to attract investment.

Because governments have different priorities, resources and policy options, international experience shows that there is no one-size-fits-all approach for all countries. Instead, approaches, strategies, instruments and means of implementing them differ and are better or worse suited depending on the specific conditions of each context, the level of development and existing capacities.

Latin American and Caribbean countries have only relatively recent experience in policies to attract investment, and the importance attached to them has increased, especially since the efforts to further liberalize their economies in the 1990s. These policies have evolved over time in response to changes in the global economic environment and the region's own economic and political conditions.

Over the past two decades, many countries have begun advancing in designing more active, strategic policies to attract and encourage FDI. They have progressed from adopting general measures with no specific sectoral focus (for example, entry regulations and initiatives to eliminate red tape) towards measures that focus more on priority sectors or areas for productive development, even though the panorama remains uneven and there is room for more targeted action.⁴ More recently, a novel —albeit incipient and slow— trend has been observed in policies to attract investment to the region, this time looking at the contribution of FDI to sustainable development.

Although in Latin America as in the rest of the world, policy instruments have progressively become more diversified, the main incentives for attracting investment are still grounded in tax-related measures. Lowering corporate income tax is the most common tax incentive in the region, accounting for more than half the incentives offered between 2011 and 2021 (UNCTAD, 2022). This type of incentive may be based on earnings, providing tax breaks on profits, or on capital investment spending, providing reductions after the fact through deductions, accelerated depreciation schemes, tax credits or other mechanisms. Incentives based on capital investment have greater potential to promote reinvestment while enhancing integration with the local economy. However, this type of instrument remains uncommon in Latin America and the Caribbean, accounting for only one third of all new income tax-based incentives in the region between 2011 and 2022 (UNCTAD, 2022).

Although tax incentives can influence investment decisions to some degree, they are not enough to attract investment. Generally speaking, in addition to tax incentives, a set of diversified instruments is needed to de-risk investment. In terms of decisions to invest, it has proven essential to have infrastructure, productive capacity, a skilled workforce and a set of complementary activities along the value chain, among other elements, meaning that efforts to attract FDI must be coordinated with actions usually taken under productive development policies and agendas in order to address the

⁴ This is even truer in light of studies that suggest that investment promotion agencies with strongly targeted strategies and working methods are those with the greatest influence on the investment decisions of multinational corporations when setting up in a given country (in this regard, see, for example, Volpe Martincus and others, 2021).

bottlenecks that limit both the attractiveness of investing and any possible returns. The implementation of special economic zones is an example of this. A study by Frick and Rodríguez-Pose (2023) on implementing these zones in Africa, Asia and Latin America shows that good industrial infrastructure, a strategic location and quality services made it easier to attract investment. However, the availability of instruments such as tax incentives and corporate income tax exemptions was not the most relevant factor for investors, although their importance might have been underestimated if they were taken for granted (Frick and Rodríguez-Pose, 2023). Although the authors do not explicitly say so, it can be deduced from the study that in order to attract FDI, it is important to use a strategic combination of instruments.

Despite the various advances in policies to attract investment, with their strengths and weaknesses depending on the context, FDI inflows to Latin America and the Caribbean continue to fluctuate, remaining uneven and alternating between periods of growth and deceleration. In general, market forces have nudged FDI towards the predominant sectors in the economies of the region, and instances of knowledge and technology transfer have been limited to certain, more dynamic sectors, with marked differences between countries and even between regions within countries. However, with some exceptions, the countries of the region have not succeeded in using FDI to bring about structural change and productive development. In the current regional context, marked by low growth and difficulties linked to the green transition and the creation of quality jobs, the challenge of attracting and retaining FDI that contributes to the region's development remains as relevant as ever.

The progress made in establishing national and subnational investment promotion agencies stands out among the efforts of the governments of the region in that regard. More than 20 of the 33 countries of the region have national investment promotion agencies (Volpe Martincus and others, 2021). The proliferation of specialized agencies is a response to the challenge faced by recipient countries of reporting on their features and advantages so that foreign investors will consider them. This general aim usually encompasses three goals: showcasing the advantages of a given location, providing relevant information to potential investors, and facilitating the process by which foreign companies make decisions, set up operations in the country and possibly expand (ECLAC, 2007). The good practices of investment promotion agencies include a cycle comprising several stages: strategic vision, attraction, entry and establishment, retention and expansion, and linkages and spillovers.⁵

The agencies of the region are quite varied in terms of institutional form, size and dedicated resources. In general, however, they are autonomous public entities that are linked with ministries of trade, investment or industry. Being relatively recent additions to the institutional frameworks of the region and in light of the structural limitations proper to their context, it is not surprising that investment promotion agencies in the region have fewer resources than their peers in the countries of the Organisation for Economic Co-operation and Development (OECD). According to Volpe Martincus and others (2021), the median investment promotion agency in Latin America and the Caribbean has a total budget of US\$ 4.2 million, around one third that of the median investment promotion agency in OECD. In addition, the median number of staff promoting investments in the region is 21, nearly half that of the investment promotion agencies in OECD. Given these limitations, it is even more important to address efficiency in policy design and implementation in order to attract investment.

As they pursue their objectives, the tasks of the investment promotion agencies of the region include disseminating information, facilitating and retaining investments, conversing with and supporting foreign investors, building up the image of the country and promoting policy (ECLAC, 2007; Volpe Martincus and others, 2021). As such, and although there is still room for improvement in that regard, these agencies can support the implementation of governments' FDI priorities in terms of regions, functions, sectors, types of companies and specific projects (Gligo, 2007).

⁵ According to the World Bank model. See Heilbron and Aranda-Larrey (2020).

Historically, FDI inflows to the region have gone to various sectors, from manufacturing and infrastructure to services and, to a greater degree, natural resources and agriculture, depending on the subregion being analysed. However, a brief quantitative analysis of policies to attract investment indicates a growing effort to target specific sectors. Data from the United Nations Conference on Trade and Development (UNCTAD)⁶ show that, between 2010 and 2021, most of the measures adopted in the region to attract foreign direct investment (58%) were aimed at specific sectors, while 42% were general, with no sectoral differentiation. When a particular sector was prioritized, it was usually energy (27 measures), followed by transport (14), mining (9), telecommunications (6) and agriculture (5).

A look at the strategic priorities of investment promotion agencies in Latin America and the Caribbean in particular shows efforts in recent years to reorient the methods used to attract investment. In 2018, the highest-profile sectors were agriculture and agroindustry, tourism and hospitality, infrastructure and construction, and manufacturing. By 2022, although these sectors remained important, there had also been some changes. Natural resources, information and communications technology (ICT), and health and life sciences rose the most among agency priorities. In second place in terms of gains were renewable energy, the environment and logistics. Infrastructure and construction, the highest priorities in 2018 for investment promotion agencies, fell the most in 2022.

These new priorities could indicate a growing concern among the governments of the region to respond to global challenges and the opportunities of the digital and green transitions, which have gained prominence following the pandemic and the conflict in Ukraine. The priorities of investment promotion agencies and the main target sectors for mergers and acquisitions and investment project announcements (see sections I.B.4.1 and I.B.4.2) are now somewhat aligned: opportunities in information and communications, natural resources and renewable energies have been identified by both public and private agents.

The increase in the number of operations and announcements related to conventional energy sources, such as oil and gas, is a reflection of market logic. In this regard, one challenge to keep in mind is the need to create incentives so that inflows of foreign capital aimed at non-renewable energies consider the energy transition objectives of countries and the region, in particular with regard to incentives for clean and renewable energy production and for the funds originating from oil and natural gas exploration and production to be used for the sustainable development of other sectors of the economy (FDI in non-renewable energy and the main challenges for the region are analysed in greater detail in chapter II).

As analysed in chapter III, the fact that renewable energy has become a priority for investment promotion agencies and investors reflects the strategic priorities of countries, the abundant natural resources of the region, and the growing demand for clean energy, in a context that is also marked by international environmental commitments. In particular, achieving the Sustainable Development Goals of the 2030 Agenda demands an accelerated transformation of the energy mix, which can only be realized by stepping up investment in renewable energy. To achieve this, the countries of the region are applying deliberate policies to attract investment, using a range of instruments: tax and financial incentives (some general and others specific to renewable energies), regulatory measures, and increasingly other market-related tools, such as green bonds and alternative sustainability certifications, as a way to complement and create synergies with policies to attract investment in renewable energies, while at the same time seeking to overcome fiscal constraints (Podestá and others, 2022). In fact, successful examples of attracting investment in renewable energy, as in Chile and Uruguay, in particular in promoting solar and wind power, show that although economic instruments are important, they are not enough. Long-term policies, programmes for research and development and innovation, and certain regulations are highly complementary and efficient, and should be considered (see chapter III for more details).

⁶ The study by UNCTAD (2022) includes 166 policies implemented by countries in the region between 2010 and 2021.

The example of renewable energies illustrates the potential of FDI to make a major contribution to both sustainable and productive development. However, for that potential to be realized, certain challenges must be addressed. In terms of productive development, international literature and experience suggest certain points worthy of attention that could inspire the governments of Latin America and the Caribbean in their efforts to improve the design of policies to attract investment and strengthen institutional capacity. These points are:

- **Promote active, comprehensive and long-term policies.** The most successful countries adopt more active and comprehensive policies, meaning deliberate measures to attract quality investment that are consistent with national development needs and priorities (ECLAC, 2007). This presupposes a shared vision of the future of a country's development and the role of FDI, which can lay the groundwork for guiding investment attraction policies (public, private, domestic and foreign) and coordinating those policies with other components of development policy (such as the macroeconomic, productive development, environmental and social aspects). In addition, defining long-term strategic objectives is key for the predictability and stability that investors seek when mobilizing resources and choosing where to place their assets.
- **Create an enabling environment for productive FDI and focus on strategic sectors.** Broadly speaking, FDI flows depend on a series of sector-specific macroeconomic and policy factors. Indeed, human capital, local financial market development, private sector strength and development, competition, and the availability and quality of general and specific infrastructure, among other factors, are key for enabling FDI to make a positive impact on productivity and economic growth. Countries have a variety of measures at their disposal to influence these factors, as well as to encourage (or discourage) investment, and as mentioned, they have mainly been used to select strategic sectors. By doing so, governments seek to leverage positive externalities in terms of knowledge generation, employment, productive linkages, technology transfer and high social and environmental performance, while at the same time mitigating risks. There is no doubt that targeting is important and must be tailored to the priorities of each context. However, it should be borne in mind that, on their own, policies to attract FDI are not sufficient to improve the results of FDI as a means for transferring knowledge and technology to recipient countries, and must be complemented by policies to strengthen local capacity to absorb investment (education, institutional frameworks, and the development of physical, scientific and technological infrastructure). It is therefore key to create a framework for efforts to attract FDI through the productive development policies⁷ of countries and their territories. Along those lines, it could be useful to align efforts to attract FDI with the work on cluster initiatives being undertaken in many countries in the region, in particular to attract investment to complement or strengthen missing or weak links in local value chains (Llinás Vargas, 2021).
- **Leverage incentives, evaluation and adaptation to promote sustainable development.** For some years now, there has been greater recognition of the role of FDI as a way to support the achievement of the Sustainable Development Goals (SDGs) rather than as an end unto itself (ECLAC, 2023; UNCTAD, 2015; OECD, 2022b). At the institutions working to attract FDI, this is reflected in a stronger focus on the design of policy instruments and on appropriately linking and coordinating them. In the energy sector, specifically, this means developing an integrated strategy for the entire energy mix and reconciling the investment attraction mechanisms geared towards transforming the conventional energy industry so that more environmentally friendly standards are adopted, with incentives aimed at progressively increasing the share of non-conventional renewable energies. It is also key to continuously assess and monitor the measures implemented

⁷ Productive development policies, also known in the literature as industrial policies, include the set of instruments (incentives, regulations and other forms of participation) through which States promote the development of certain activities or economic agents in accordance with national development priorities.

and the economic, social and environmental effects of investment on sustainable development. By using these tools, agencies can analyse their efforts and adjust them to enhance their impact based on pre-established goals and priorities.

- **Deepen the focus on the multiple levels of investment mobilization and stakeholder coordination.** Placing productive and sustainable development at the centre of policies to attract FDI requires attention to the global, regional, national and subnational dynamics that affect capital flows. The success of policies and institutions in attracting investment depends on a whole-of-government approach that ensures coordinated, consistent and flexible efforts between different areas and ministries and at different levels of public administration. At the subnational level, local investment promotion agencies can contribute to attracting FDI and creating jobs in less developed regions. This enables them to respond to development challenges that are more geographically localized, especially in larger and very heterogeneous countries. Against this backdrop, ensuring the long-term sustainability of institutions remains a challenge. Lastly, it is equally important to promote coordination between the public and private sectors and between national and subnational governments. In particular, improving coordination between national and local investment promotion agencies in attracting FDI will be key.

In the current global context, which is characterized by a growing and renewed interest in productive development policies, many countries are analysing investment attraction and promotion strategies in light of needs related to the energy transition, human capital and the development of productive capacities and value chains. As an example, COVID-19 recovery packages in the United States and the European Union combine programmes and instruments to direct investment —national and international— towards activities that promote the green transition and the development of local technology and capacities. Among the most common instruments are sectoral and technological incentives, initiatives to localize productive activities related to new technologies and evaluation mechanisms for investments that are considered strategic.

Similarly, for developing countries, which generally have lower capacity and less mature markets, it is essential for FDI to be framed by productive development strategies in order to generate synergies and avoid conflicting incentives. In general, by defining priorities and subsidy and incentive schemes, productive development policies play a critical role in directing investment towards specific sectors, technologies and activities. At the same time, investment policies —tailored to the needs of each country— can provide incentives and regulatory instruments for developing specific industries and sectors, integrating national industries into global and regional value chains, attracting cutting-edge technologies, transferring technology and knowledge and strengthening existing capacity.

In this context, there is an urgent need in the countries of Latin America and the Caribbean for productive development strategies for the recovery and the green transition that use FDI as a strategic tool to develop capacity and technological sophistication, fine-tuning instruments in keeping with the development needs of each country and maximizing the benefits of FDI for sustainable development.

E. Conclusions

The global FDI panorama was uneven in 2022. The main recipient of investments, the United States, received less FDI than in 2021, while China, Latin America and the Caribbean, Singapore, Australia, India and some countries in the European Union recorded significant investment growth. Multiple successive crises around the world, inflation, and high interest rates weighed on cross-border investments. However, elevated commodity prices and the search for investment in energy —whether to secure supply or advance towards the energy transition— and in technologically strategic sectors, such as semiconductors and electronic components, spurred companies to seek investments abroad.

In this scenario, Latin America and the Caribbean saw inflows of US\$ 224.579 billion in 2022, an all-time high. The marked growth in FDI inflows to Brazil, the top recipient country in the region and fifth worldwide in 2022, had the greatest impact on this increase, although FDI inflows were also up in nearly all the countries of South America, Mexico, several countries in Central America and the main recipient countries in the Caribbean.

From the perspective of investment components, recovery in the region was characterized by strong year-over-year growth in reinvested earnings and intercompany loans, while growth in equity was more subdued (despite which it remained the second largest component). From the point of view of productive development, inflows of investment through equity may be a better reflection of growing interest from new companies in setting up operations in the region, since both reinvested earnings and loans between subsidiaries and parent companies reflect established trends for companies in the region. In this sense, the recovery in 2022 was driven mainly by the activity of multinational corporations that are well-established in the countries of Latin America and the Caribbean and have decided to expand operations. This pattern makes sense when taking into consideration the post-pandemic recovery, and it is unclear whether it will continue in 2023.

In terms of sectors, the bulk of inflows over the past three years was concentrated in services, and 2022 was no exception. Investments were highest in financial services, electricity, gas and water, information and communications, and transport-related services. Investment in manufactures grew strongly in the countries and sectors that have built up capacity over the years, a process supported and driven at times by public policies, maintaining multinationals' interest in investing in those areas.

There was renewed interest in 2022 in investing in natural resource exploitation in the region, which has been linked to a significant degree with the growing interest in the energy sector. Not only is this interest reflected in stronger FDI inflows, which grew after a two-year decline in the context of a downtrend, it has also affected the outlook for new investments.

Both globally and in the region, the energy sector played a key role in FDI project announcements. Renewable energies ranked first at the global level in the number of announcements, accounting for 29% of the total by value, and third in announcements at the regional level, with 11% of the value, while the coal, oil and gas sector was in second place globally by number of announcements, accounting for 9% of the value, and in first place at the regional level, with 24% of the value.

These investments are consistent not only with higher energy demand, against a backdrop of economic activity recovery following the critical phase of the COVID-19 pandemic, but also with meeting the demand of the 700 million people who lack access to modern sources of energy, in line with Sustainable Development Goal 7.⁸

Although the level of investment in general and of FDI in particular remains insufficient to enable a reliable and affordable energy transition and meet global and regional energy and climate goals, the global appetite for renewable energies is influencing foreign investors' interest in other sectors in the region. Of the 20 largest mergers and acquisitions recorded in Latin America and the Caribbean in 2022, 4 were related to the mining of copper and lithium, metals that are essential in the renewable energy value chain and, as a consequence, in enabling the energy transition. Given the importance of the energy sector, chapters II and III of this report contain an analysis of FDI trends in the non-renewable and renewable energy sectors, respectively, in the context of the energy transition.

Lastly, the challenge of attracting and retaining FDI that contributes to sustainable and inclusive development in the region remains as relevant as ever, and countries must make efforts to enact the right kind of policies if they wish to attract and retain FDI that supports their development process and allows for the realization of the potential of FDI to build capacities, create quality jobs, transfer technology and enhance the diversification and sophistication of the production mix. As proposed in

⁸ Ensure access to affordable, reliable, sustainable and modern energy for all.

section I.D, the countries of the region must improve policy design in order to attract investment and strengthen the relevant institutional capacity, and it will be key to boost the coordination of efforts to attract FDI with productive development strategies and to begin using FDI more deliberately as a strategic tool to further sustainable development processes.

F. Analysis of FDI inflows by country

This section presents a brief analysis of the year-on-year investment trends for the countries for which 2022 data are available, based on the components of FDI, the sectors receiving investment and the countries of origin, while highlighting some of the major milestones for each country that have not yet been mentioned in other sections of the document. Specific quantitative information for each country is available in the annex.

1. Brazil

In 2022, the value of investments received in Brazil compared to 2021 almost doubled (a 97% increase), with FDI inflows of US\$ 91.502 billion,⁹ following two years when figures were well below the historical average. This renewed interest of foreign capital investors in the country was reflected in all three FDI components, which grew compared to the previous year: equity remained the primary component (40% of the total, up by 22% relative to 2021 in terms of value), followed by reinvested earnings (37% of the total, up by 100% compared to 2021) and lastly intercompany loans (23%), which recorded the strongest growth after registering negative figures in 2021.

Unlike in 2021, when only FDI in services increased, in 2022, all major sectors of activity received more investment.¹⁰ In line with the historical trend, multinational companies focused on services, which received 50% of FDI (32% higher than the amount recorded in 2021), followed by manufactures (34%) and natural resources (15%). While manufacture inflows were nearly triple the amount invested in 2021 (up by 157%), these inflows have not yet returned to pre-pandemic levels. Natural resource inflows rebounded after recording negative inflows in 2021, but are still below the average of the past decade.

Notwithstanding the above, one noteworthy element in 2022 was the importance of investments in hydrocarbons, in both natural resources and manufactures. Oil and gas extraction (13% of total FDI), together with refining of coke, petroleum products and biofuels (16%), accounted for 29% of total FDI inflows. These were followed by non-financial holding companies and financial services (both representing 8% of the total), the automotive industry (7%), electricity and gas services (7%), ICT services (4%), trade (4%), the chemicals industry (3%) and mining support services (2%). These 10 sectors accounted for 73% of total inflows in 2022 and trade was the only activity in which foreign capital inflows decreased compared to 2021. Notably, inflows related to ICT services exceeded US\$ 2 billion in 2022 and 2021, compared to annual investments of roughly US\$ 700 million in the past decade.

The growing interest in the Brazilian ICT market is reflected in the third largest merger and acquisition of assets in the region (see table I.3), which does not constitute an FDI inflow into the country as the transaction involved two foreign companies. Just Eat Takeaway, based in the Kingdom of the Netherlands, sold its remaining minority stake in Brazil-based iFood to Prosus, also based in the

⁹ These figures correspond to those compiled according to *Balance of Payments and International Investment Position Manual: Sixth Edition (BPM6)*, Washington, D.C., 2009, and differ from the results based on the figures compiled in IMF, *Balance of Payments and International Investment Position Manual: Fifth Edition (BPM5)*, 1993.

¹⁰ The sectoral composition corresponds to equity and intercompany loans, since the data by sector reported by Brazil do not include reinvested earnings.

Kingdom of the Netherlands, for US\$ 1.5 billion. iFood, the market leader in Brazil, had already been receiving financial support since 2013 from Prosus, which was betting on the growth potential of the Brazilian market, which only intensified during the COVID-19 pandemic (Reuters, 2022; *The Sunday Times*, 2021).

The two countries that accounted for most of the FDI in Brazil were the Kingdom of the Netherlands, representing 25% of the total and reflecting a recovery from the negative figure for 2021, and the United States, accounting for 24% of the total and a 15% increase compared to 2021. Other notable investors that invested more heavily in 2022 compared to the previous year were France, which accounted for 8% of the total and injected the largest amount since 2010, Spain (6% of the total), Chile (5%), Hong Kong, China (5%) and the United Kingdom (4%).

One point to consider when analysing figures on the origin of investment is that national accounts reflect the immediate origin of capital, not the ultimate controller. As previously mentioned, investments from the Kingdom of the Netherlands do not necessarily reflect the activity of companies from that country, but rather the fact that its financial market makes it favourable for cross-border investments by companies based in other countries. According to estimates by the Central Bank of Brazil, the stock of investment of the Kingdom of the Netherlands in Brazil by immediate origin of capital is US\$ 125.9 billion as of 2021, while the stock as ultimate controller of capital is substantially lower and amounts to US\$ 19 billion. The reverse is true in the case of China, which plays a smaller role as an immediate origin of capital, but, as the ultimate controller, the stock of Chinese capital in Brazil is estimated at US\$ 29.9 billion as of 2021 (Central Bank of Brazil, 2023). Considering the ultimate controller of capital, the United States has the largest position in Brazil (US\$ 191.6 billion), followed by Spain (US\$ 47.9 billion) and France (US\$ 37.9 billion).

2. Mexico

In 2022, FDI inflows to Mexico increased for the third consecutive year and US\$ 38.932 billion was received, 16% more than in 2021.¹¹ The main components of this investment were equity and reinvested earnings, which accounted for 46% and 42% of the total, respectively, both up from the previous year (by 31% and 28%, respectively). Income from intercompany loans accounted for a smaller share (12%), and even less capital was received than in the previous year for this item (-33%).

Since 2017, services have overtaken manufactures as the top target of FDI and this situation continued in 2022. Services accounted for 56% of total inflows, the highest share since 2010, and received more investment than in 2021 (an increase of 47%).¹² Manufacturing inflows recorded a smaller increase (9%) and accounted for 38% of the total. Investments in natural resources, meanwhile, trended downward (-59%), although this is due mainly to the fact that the value of 2021 was a record high, and the total received in 2022 is in line with the average investments received by the sector in the past decade.

In 2022, investments in the film and video industry (15% of the total, compared to only 0.2% between 2010 and 2021) and air transport (6% of the total, compared to 0.3% between 2010 and 2021) were particularly noteworthy. Investment figures for the film industry are explained by the merger between Grupo Televisa of Mexico and Univision of the United States, while those relating to air transport are due to restructuring at Aeromexico. Beyond these one-off events, investments in financial and insurance services (13% of the total) and in transport equipment manufacturing (12% of the total)

¹¹ These figures correspond to those compiled according to *Balance of Payments and International Investment Position Manual: Sixth Edition (BPM6)*, Washington, D.C., 2009, and differ from the results based on the figures compiled in IMF, *Balance of Payments and International Investment Position Manual: Fifth Edition (BPM5)*, 1993.

¹² Mexico presents information on FDI inflows by sector and origin according to IMF, *Balance of Payments and International Investment Position Manual: Fifth Edition (BPM5)*, 1993.

have stood out, reflecting the importance of the automotive industry for attracting investment in Mexico, although in both cases less investment was received than in 2021 (5% and 21% less, respectively). In this regard, the announcement of the US\$ 5 billion investment project by electric vehicle manufacturer Tesla, which plans to build a factory in the State of Monterrey, further highlights the potential of the automotive industry to attract investment to Mexico. Other notable activities were related to basic metals (6%), mining (5%), transport-related services (4%), civil engineering construction (4%), the food industry (4%), and short-term accommodation and food and beverage preparation services (4%). Together, these 10 service and manufacturing activities accounted for 74% of total inflows in the country, with most of them seeing an increase in inflows compared to 2021 (except for mining and restaurants and hotels).

The United States was the main source of FDI in Mexico in 2022 (57% of the total) and more investment was received than in 2021 from that country (an increase of 54%). Other major investors that also increased investment in Mexico were Canada and Argentina, which accounted for 10% and 6% of investment, respectively. By contrast, lower investments were received from Spain (-64%), which went from being the second largest investor in previous years to the sixth largest in 2022, with 4% of investments.

3. Other South American countries

Chile received the third largest amount of FDI in 2022, US\$ 20.865 billion, which was 31% higher than inflows in 2021 and the biggest amount received in the last seven years. Reinvested earnings were the largest component (52% of the total), reflecting a 138% increase. Equity income declined (by 19%) and accounted for 42% of the total, while intercompany loans also grew, but accounted for a small share (6%).

To date, there is no information available on the sectors or origin of FDI inflows in 2022, so it is not possible to identify where these resources were directed to or which country they came from.

In terms of mergers and acquisitions, as mentioned above, foreign interest in Chilean assets in the mining and natural resource extraction sectors is noteworthy. In recent years, foreign investors have also been interested in sectors related to renewable energies in the country, and 2022 was no different. One example is the acquisition by Canada-based Innergex of the Chilean operations of the global sustainable infrastructure investment group Aela Energy, owned by Actis (60%) and Mainstream Renewable Power (40%), for US\$ 691 million. Aela Energy has grown to become the largest independent power producer in Chile (Mainstream Renewable Power, 2022).

In 2022, Colombia received US\$ 16.869 billion in FDI, up 76.4% from 2021, which was the highest value in the last 20 years. All components recorded an increase, with equity showing the strongest growth (139%) and accounting for the largest share of the total (46%). Reinvested earnings also grew (by 68%) to 38% of the total, while intercompany loans accounted for 16% of FDI.

This growth was explained mainly by higher inflows in services and natural resources, while manufacturing inflows decreased. FDI in services accounted for 65% of the total, with an increase of 71% compared to 2021. A positive trend was also recorded in natural resources (up by 228%), which accounted for 28% of inflows. By contrast, investments in manufactures decreased (by 28%) and fell to 7% of total FDI, compared to 14% over the 2010–2021 period, on average.

There was no change in major FDI source countries in 2022. Investments from the United States (29% of the total), Spain (16%) and Panama (12%) accounted for 57% of FDI inflows to Colombia, and in all cases, inflows were higher than in 2021. Interestingly, China was among the top investors for the first time, with that country placing eleventh and accounting for 2% of the total (compared to 0.2% between 2010 and 2021).

FDI inflows in Argentina more than doubled (123.2%) compared to 2021, totalling US\$ 15.408 billion, the highest level seen since 2012. Intercompany loans accounted for the largest share of FDI (57%), followed by reinvested earnings (37%), with both components recording increases compared to 2021. As a result, equity accounted for only a small share (5%) and the amount received was slightly lower than in 2021 (down by 3%).

Argentina does not provide information on FDI by sector or origin, so it is not possible to identify the target or origin of these resources. However, when analysing the mergers and acquisitions registered in the country in 2022, along with the investment projects announced the same year, foreign investors' interest in the lithium extraction and exploration sector is clear, as detailed in previous sections. There are also major investment projects targeting hydrocarbons in Argentina, and these are concentrated in the Vaca Muerta unconventional oil and gas formation.

Another significant operation in Argentina was the purchase by the United States-based SoFi Technologies Inc, a technology platform for financial services and products, of 100% of the shares of the Argentine technofinance company Technisys SA, a provider of cloud-based banking platforms, whose shares are listed on NASDAQ. The deal, valued at US\$ 1.1 billion, was considered the largest bank acquisition of an IT company since 2012 (AméricaEconomía, 2022b; S&P, 2022).

FDI inflows to Peru totalled US\$ 10.848 billion, 46% more than in 2021. FDI in the country had not exceeded US\$ 10 billion since 2012. All components recorded an increase in investment, but the lion's share of inflows corresponded to reinvested earnings (79% of the total), which were 23% higher than in 2021. The second largest component was equity (11% of the total), which recovered after registering negative inflows in 2021, while inflows corresponding to intercompany loans increased, but accounted for a smaller share of the total (10%).

The country does not provide information on FDI by sector or origin, so it is not possible to identify the target or origin of these resources.

In terms of new projects, the largest was that announced by the Spanish company Acciona Energía, which will invest close to US\$ 180 million to build its first wind farm in the country.

Uruguay received record investments of US\$ 9.325 billion in 2022, almost triple that of 2021 (an increase of 155%). As in Argentina, intercompany loans accounted for most of the FDI in Uruguay (52%), reflecting a strong recovery after registering negative figures in 2021. Reinvested earnings were the second largest component of FDI inflows (37%), followed by equity (11%). Inflows in all three components grew compared to 2021.

To date, there is no information available on the sector or origin of FDI inflows in 2022, so it is not possible to identify the target or origin of these resources. However, on the basis of announced investment projects, renewable energies accounted for a significant share of FDI in the country. In 2022, Germany-based Enertrag announced a US\$ 628 million project, the first green hydrogen exploitation project in the country, which would involve the conversion of green hydrogen into ethanol through wind and solar plants, an electrolyzer and conversion facilities (Uruguay XXI, 2022).

In Ecuador, FDI inflows increased compared to 2021 (by 28.1%) to US\$ 829 million. This total includes higher FDI inflows of equity.

The growth was explained by bigger investments in services (163%), which received US\$ 888 million. Negative inflows in natural resources (-US\$ 137 million) explained the total figure received, while investments in manufacturing declined relative to 2021 (81%).

The main source of FDI was Uruguay, which accounted for US\$ 722 million. By contrast, inflows from Canada were negative (-US\$ 347 million dollars). Investment from other countries (the main ones were China, Spain, Mexico and the United States), did not exceed US\$ 60 million.

FDI in Paraguay was higher than in 2021 (129%) and totalled US\$ 474 million. Most of the inflows corresponded to reinvested earnings (64% of the total), which were 61% higher than in 2021. These were followed by equity (33% of the total), which fell by 31% compared to the previous year. Intercompany loans rebounded after falling sharply in 2021, but accounted for just 3% of total FDI received by the country in 2022.

To date, there is no information available on the sector or origin of FDI inflows in 2022, so it is not possible to identify the target or origin of these resources.

In the Plurinational State of Bolivia, negative FDI inflows were recorded in 2022 (-US\$ 26 million), which was a significant decrease compared to the inflows received in 2021 (105%). This trend was explained by divestments in hydrocarbons (US\$ 307 million), and to a lesser extent in manufactures (US\$ 12 million). Investment trends were positive for other economic activities, mainly mining (US\$ 158 million) and financial intermediation (US\$ 73 million) (Central Bank of Bolivia, 2023).

4. Central America

With FDI inflows of US\$ 3.673 billion in 2021, Costa Rica was the leading FDI recipient in Central America. This figure is higher than the amount received in 2021 (2.2% variation) and in line with the highest amounts received by the country. Reinvested earnings accounted for the largest share of FDI (71% of the total) and grew by 30%. Equity (18% of the total) and intercompany loans (12% of the total) fell by 28% and 39%, respectively.

The majority of investments targeted manufactures (68% of the total), although flows were weaker than the level received in 2021 (down by 15%), while investments in services were stronger than in the previous year (12%) and represented 33% of the total.¹³

Investments are highly concentrated by origin. The United States accounted for 73% of the total, although flows from that country declined (by 12%), while investment from Switzerland increased, accounting for 9% of the total. Other notable sources of investment were Colombia (3%), Mexico (2%), Spain (1%) and Germany (1%).

In 2022, Panama was the second largest recipient of FDI in Central America, with US\$2.513 billion, up 43% from 2021. While this recovery is significant, FDI inflows remain below pre-pandemic levels. Reinvested earnings and intercompany loans were the main components of FDI, both of which grew relative to 2021, while equity inflows were negative. As there is no information available on FDI by sector or origin for 2022, it is not possible to determine where FDI inflows were directed or where they originated.

In terms of future prospects, there was a significant change in 2022 compared to 2021. Large-scale projects were announced in the renewable energy and transport and storage sectors, totalling some US\$ 4.3 billion. In addition to the bioenergy production megaproject mentioned above (see section I.B.4.b), Switzerland-based Mediterranean Shipping Company (MSC) announced a project to build a container terminal in Panama, with an estimated investment of US\$ 1.4 billion.

In 2022, FDI inflows to Guatemala totalled US\$ 1.352 billion, lower than the previous year (down by 61%). While 2021 was a record year owing to a large telecoms acquisition, the value of inflows in 2022 is still higher than the levels seen between 2015 and 2020. Reinvested earnings accounted for the lion's share of FDI in 2022 (84% of the total), but decreased by 7% compared to the previous year. Meanwhile, the second largest component, intercompany loans (which accounted for 12% of

¹³ Information by sector and origin is presented according to IMF, *Balance of Payments and International Investment Position Manual: Fifth Edition (BPM5)*, 1993.

the total), grew by 390%. Equity inflows decreased by 98% compared to the record inflows seen in 2021, meaning these once again represented the smallest share of FDI inflows into the country (accounting for just 4%).

Most investments were directed towards services (77% of the total), despite the fact that they decreased (by 67%). Investments in manufactures were also lower (down by 45%), representing 12% of the total, while investments in natural resources increased (354%), representing 7% of the total.

Inflows originated mainly from five countries, which accounted for 79% of the total: the United States (19%), Colombia (19%), Luxembourg (16%), Mexico (14%) and Panama (10%). Of these, only the United States and Mexico increased investments in 2022.

Nicaragua received US\$ 1.294 billion in FDI in 2022, 6% more than the previous year. The growth was due to a 54% increase in inflows corresponding to reinvested earnings (73% of the total). The other components, equity (24% of the total) and intercompany loans (3%), fell by 14% and 84%, respectively, compared to the FDI inflows recorded in 2021.

The country does not provide information on FDI by sector or origin, so it is not possible to identify the target or origin of these resources.

FDI in Honduras in 2022 totalled US\$ 1.082 billion, 35% higher than in the previous year. Most of the FDI corresponded to reinvested earnings (75% of the total), although investments in this component were lower than in 2021 (down by 32%). Meanwhile, inflows from intercompany loans and equity increased, although the share of equity was very small (1% of the total).

Services accounted for the majority of investments (91%), followed by natural resources, which also reflected a positive trend. By contrast, manufacturing recorded negative inflows, although the amount was small (-US\$ 24 million).¹⁴

Three countries accounted for 71% of FDI in 2022: Panama (29%), the United States (23%) and Colombia (19%), and only Colombia reflected a reduction in investment compared to the previous year.

El Salvador recorded negative FDI inflows in 2022 (- US\$ 101 million), representing a variation of -133% compared to 2021. This situation is explained by divestment in the manufacturing sector (-US\$ 294 million), which was not offset by investment in services, which also declined compared to 2021 (-35%).

The decrease in investment from Spain and Panama largely explains the performance in 2022, with negative inflows (-US\$ 321 million from Spain and -US\$ 32 million from Panama). Mexico accounted for the largest investment, followed by the United States, Honduras and Switzerland, with smaller amounts.

One acquisition involving countries in the subregion was the sale of Mexico-based cement company CEMEX's assets in Costa Rica and El Salvador to Cementos Progreso Holdings of Guatemala. The transaction, which was intended to optimize the global portfolio of CEMEX, was valued at US\$ 329 million (CEMEX, 2021; Forbes Mexico, 2022).

5. The Caribbean

Once again, in the Caribbean, Guyana recorded the highest FDI inflows, which totalled US\$ 4.389 billion in 2022. The result is similar to the record inflows in 2021 (only a -1.5% change). The performance is due, once again, to foreign investors' interest in the country's hydrocarbon sector. Hence, the natural resources sector accounted for 99% of FDI inflows into the country in 2022, although inflows into the sector were 2% lower than in 2021. Manufactures (which represent 1% of the total) also recorded a drop, of 9%.

¹⁴ Information by sector and origin is presented according to IMF, *Balance of Payments and International Investment Position Manual: Fifth Edition (BPM5)*, 1993.

The project announcements registered in 2022 indicate that the country's hydrocarbon sector will continue to receive large investments in the coming years. In this connection, the United States-based oil company ExxonMobil announced a US\$ 10 billion investment project in the country.

The Dominican Republic received US\$ 4.01 billion in FDI, 25% higher than in 2021 and the highest level in the last 30 years. An examination of FDI components shows that the result was due to a 39% increase in equity, which accounted for 56% of total inflows. Meanwhile, reinvested earnings (36% of the total) fell by 14% compared to the previous year. Intercompany loans were the smallest component (8% of the total), although they recorded a significant increase compared to the negative result obtained in 2021.

With regard to sectors, the 29% growth in services was notable, and derived from record inflows in 2022, totalling US\$ 3.034 billion and representing 76% of total FDI inflows into the country. The sector is expected to continue its upward trajectory in the coming years, given the momentum in some segments. Through a green loan from the Bank of America and multilateral banks, Consorcio Energético Punta Cana-Macao (CEPM), part of the InterEnergy group, announced that it plans to invest US\$ 1 billion to increase its renewable energy generation capacity in the Dominican Republic. The announcement, made at the twenty-seventh session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 27), held in Egypt in 2022, is in line with the company's "net zero" strategy and would make CEPM one of the world's first zero-emission, 100% renewable electric utilities, contributing to ambitions related to sustainable tourism in the Dominican Republic (Bank of America, 2022; *Revista Mercado*, 2022).

The second most representative sector was manufacturing, which accounted for 15% of the total and received 95% more inflows in 2022 than the previous year. By contrast, inflows into the natural resources sector (representing 9% of the total) dropped by 30% compared to 2021.

The United States remains the largest foreign investor in the Dominican Republic, accounting for 38% of total inflows in 2022. In addition, FDI inflows originating in that country grew by 8% over the previous year. With respect to inflows from other countries, the 63% growth in capital from Spain is notable, representing 9% of the total invested in the Dominican Republic in 2022, behind only Mexico (accounting for 10% of the total and representing 1% growth in the year analysed) and Canada (also with 9%, representing a 4% decrease).

The Bahamas was the third largest recipient of FDI in the Caribbean, with a total of US\$ 1.255 billion in 2022, up 19% from 2021. This was mainly driven by intercompany loans, which increased by 25%.

Jamaica received the fourth largest amount of FDI in the Caribbean, with a total of US\$ 319 in 2022. This figure was similar to the amount received in 2021 (-0.2%) and investment has still not returned to pre-pandemic levels. Tourism attracted the most investment in the country (51% of the total amount), and as a result, services accounted for the bulk of FDI inflows (59% of the total), reflecting a 15% increase compared to 2021.

FDI inflows to Belize in 2022 totalled US\$ 134 million, the highest level since 2014 and 6% higher than in 2021. This increase was due mainly to equity, for which inflows accounted for 88% of FDI received by Belize in 2022 and recorded 319% growth compared to the previous year. Reinvested earnings grew by 18% and represented 12% of the total, while intercompany loans were not representative.

In 2022, the Organization of Eastern Caribbean States (OECS), comprising Antigua and Barbuda, Dominica, Grenada, Saint Lucia, Saint Kitts and Nevis, and Saint Vincent and the Grenadines, failed to sustain the recovery in FDI inflows seen in 2021. Overall, the countries received US\$ 553 million, 20% less than the previous year. Investment was weaker in all countries except Grenada.

FDI in Antigua and Barbuda totalled US\$ 196 million in 2022, lower than the previous year (-20%), but in line with the levels received in the years prior to the pandemic. Investment inflows into Grenada continued to recover following the decline in 2020, and totalled US\$ 160 million, up by 14%

compared to 2021. After recovering sharply in 2021, FDI in Saint Vincent and the Grenadines totalled US\$ 86 million in 2022, down 46% from the previous year. Investments in Saint Lucia also decreased (by 22%), totalling US\$ 67 million in 2022. FDI inflows to Dominica amounted to US\$ 28 million in 2022, down 16% from the previous year. In 2022, Saint Kitts and Nevis was unable to sustain the recovery in investment in the aftermath of the pandemic and received US\$ 16 million in FDI, down 41% from 2021.

FDI inflows to Suriname remained negative in 2022 (- US\$ 5 million). However, the variation was positive compared to 2021 (96%), when this figure had been higher.

Lastly, Trinidad and Tobago recorded negative FDI inflows (-US\$ 914 million) in 2022. An analysis of the components of FDI shows that the most significant disinvestments were due to the repayment of intercompany loans. The origins of these disinvestments were mostly from the United Kingdom (negative inflows of US\$ 2.232 billion), as well as from Canada, Barbados, the Kingdom of the Netherlands and Saint Lucia. Meanwhile, investments from the United States amounted to US\$ 1.337 billion.

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Annex I.A1

Table I.A1.1

Latin America and the Caribbean: FDI inflows by country, 2003–2022^a
(Millions of dollars)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Antigua and Barbuda	179	95	238	361	341	161	85	101	68	138	101	46	114	97	151	205	128	77	245	196
Argentina	1 652	4 125	5 265	5 537	6 473	9 726	4 017	11 333	10 840	15 324	9 822	5 065	11 759	3 260	11 517	11 717	6 649	4 884	6 903	15 408
Bahamas	713	804	1 054	1 492	1 623	1 512	646	1 097	1 409	1 034	1 590	3 551	713	1 260	901	947	611	897	1 052	1 255
Barbados	185	228	390	342	476	615	255	446	456	527	118	592	418	269	206	242	215	262	237	-
Belize	-10.9	111	127	109	143	170	109	97	95	189	95	153	65	44	24	118	94	76	125	134
Bolivia (Plurinational State of)	197	85	-287.8	281	366	513	423	643	859	1 060	1 750	657	555	335	712	302	-216.6	-1 129.5	584	-26.4
Brazil	10 123	18 161	15 460	19 418	44 579	50 716	31 481	82 390	102 427	92 568	75 211	87 714	64 738	74 295	68 885	78 163	69 174	37 786	46 439	91 502
Chile	3 486	4 969	5 991	4 755	10 545	18 812	12 750	14 849	26 369	31 802	21 121	25 528	17 766	11 363	5 237	7 943	13 579	11 447	15 933	20 865
Colombia	1 720	3 116	10 235	6 751	8 886	10 564	8 035	6 430	14 647	15 040	16 210	16 169	11 621	13 858	13 701	11 299	13 989	7 459	9 561	16 869
Costa Rica	575	794	861	1 469	1 896	2 078	1 615	1 907	2 733	2 696	3 205	3 242	2 956	2 620	2 925	3 015	2 719	2 103	3 593	3 673
Dominica	32	27	32	29	48	57	58	43	35	59	25	12	7	42	23	78	63	22	34	28
Dominican Republic	613	909	1 123	1 085	1 667	2 870	2 165	2 024	2 277	3 142	1 991	2 209	2 205	2 407	3 571	2 535	3 021	2 560	3 197	4 010
Ecuador	872	837	493	271	194	1 057	309	166	646	567	727	772	1 323	764	630	1 389	979	1 095	647	829
El Salvador	123	366	398	267	1 455	824	366	-225.6	218	466	179	306	396	348	889	826	636	272	308	-100.9
Grenada	91	66	73	96	172	141	104	64	45	34	114	84	154	109	153	186	204	136	140	160
Guatemala	263	296	508	592	745	738	522	658	1 219	1 270	1 479	1 442	1 231	1 174	1 130	981	976	935	3 462	1 352
Guyana	26	30	77	102	152	178	164	198	247	294	214	255	122	32	212	1 232	1 695	2 060	4 454	4 389
Haiti	14	6	26	161	75	30	55	186	114	174	159	94	104	93	385	105	55	-	-	-
Honduras	403	547	600	669	928	1 006	509	969	1 014	1 059	1 069	1 704	1 317	1 147	941	1 380	947	224	800	1 082
Jamaica	721	602	682	882	866	1 437	541	228	218	413	545	582	925	928	889	775	665	265	320	319
Mexico	18 158	25 143	25 162	22 124	31 019	29 753	19 652	30 525	23 895	18 232	50 928	28 438	36 250	38 899	33 114	37 857	29 906	31 519	33 478	38 932

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Nicaragua	201	250	241	287	382	627	434	490	936	776	965	1 077	967	989	1 035	838	503	747	1 220	1 294
Panama	771	1 012	1 027	2 498	1 777	2 402	1 259	2 363	3 132	2 980	3 943	4 459	5 058	5 585	3 977	5 487	4 451	-2 477	1 761	2 513
Paraguay	28	70	42	161	443	342	156	707	603	773	366	891	582	741	523	218	402	95	207	474
Peru	1 335	1 599	2 579	3 467	5 491	6 924	6 431	8 455	7 682	14 182	9 571	4 263	7 337	6 805	7 413	5 873	4 760	791	7 420	10 848
Saint Kitts and Nevis	78	63	104	115	141	184	136	119	112	110	139	157	128	121	48	40	62	6	26	16
Saint Lucia	112	81	82	238	277	166	152	127	100	78	95	65	152	162	90	46	76	48	86	67
Saint Vincent and the Grenadines	55	66	41	110	121	159	111	97	86	115	160	124	124	71	165	40	69	65	160	86
Suriname	-76.1	-37.3	28	-163.4	-246.7	-231.4	-93.4	-247.7	70	174	188	164	267	300	96	131	84	1	-132.7	-5.4
Trinidad and Tobago	808	998	940	883	830	2 801	709	549	41	-1 904.3	-1 130.0	661	177	-23.6	-470.9	-700.2	184	1 056	-935	-914
Uruguay	416	332	847	1 493	1 329	2 106	1 529	2 289	2 504	6 394	987	4 085	2 673	-515.7	2 687	1 727	1 470	526	3 657	9 325
Venezuela (Bolivarian Republic of)	2 040	1 483	2 589	-508.0	3 288	2 627	-983.0	1 574	5 740	5 973	2 680	-1 028.0	769	1 068	-68.0	886	...	...	...	...
Total	45 903	67 234	77 028	75 373	126 484	151 062	93 700	170 651	210 839	215 737	204 615	193 535	172 969	168 648	161 693	175 877	158 153	103 807	144 981	224 579

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as at 30 June 2023.

^a Data are compiled using the methodology of International Monetary Fund (IMF), *Balance of Payments and International Investment Position Manual: Sixth Edition (BPM6)*, Washington, D. C., 2009, except in the case of the Bolivarian Republic of Venezuela, Guyana, Paraguay and Peru. The methodology of the fifth edition (2004) is used in part of the series for the following countries: Antigua and Barbuda, Dominica, Grenada, Plurinational State of Bolivia, Saint Kitts and Nevis, and Saint Lucia (2003–2013); Argentina (2003–2005); Dominican Republic (2003–2009); Ecuador (2003–2015); Guatemala (2003–2007); Honduras (2003–2012); Mexico and Nicaragua (2003–2005); Panama (2003–2014); Suriname (2003–2016); Trinidad and Tobago (2003–2010); and Uruguay (2003–2011).

Table I.A1.2

Latin America and the Caribbean: FDI inflows by destination sector, 2008–2022^a
(Millions of dollars)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Argentina^b															
Natural resources	1 537	946	2 741	1 056	6 586	5 084	-828.6	2 141	352	...	...	...	...	...	...
Manufactures	5 477	264	3 991	4 096	3 963	3 841	5 850	6 420	-1 577.5	...	...	...	...	...	...
Services	5 126	2 556	4 140	5 830	6 295	4 511	6 454	6 704	1 620	...	...	...	...	...	...
Belize															
Natural resources	37	7	13	31	101	22	10	12	28	10	21	-	-	-	-
Manufactures	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Services	117	93	79	59	82	64	113	40	10	7	86	79	67	119	-
Other	16	9	5	5	6	9	30	13	6	7	11	15	9	9	-
Bolivia (Plurinational State of)^c															
Natural resources	859	420	531	622	1 166	1 550	1 558	916	372	638	448	221	2	495	491
Manufactures	154	74	276	240	119	317	390	23	137	260	147	148	39	380	208
Services	290	193	128	171	220	162	173	227	592	312	309	206	124	177	231
Brazil^d															
Natural resources	11 210	4 288	20 278	8 901	10 140	17 180	9 391	5 924	10 140	5 030	10 644	11 448	5 283	-244.0	8 892
Manufactures	9 763	9 952	25 852	33 551	37 580	39 323	42 484	34 349	37 025	21 383	33 494	24 905	14 539	7 646	19 642
Services	9 091	5 667	7 233	28 574	27 494	23 873	34 583	31 952	22 631	32 317	17 609	12 002	12 298	21 889	28 868
Other	-	-	223	207	162	123	82	144	157	106	85	67	157	244	258
Chile															
Natural resources	4 599	6 062	6 053	12 673	13 184	6 152	6 591	8 966	1 017	993	-1 570.5	1 666	2 435	4 598	-
Manufactures	1 570	28	1 572	-54.1	1 107	1 465	3 630	526	303	-275.9	-223.9	328	-297.8	197	-
Services	8 725	7 092	7 805	12 918	14 288	10 758	14 318	7 759	7 175	636	8 822	8 438	5 893	9 636	-
Other	256	674	589	-1 387.2	3 224	2 747	989	515	2 868	3 884	915	3 147	1 175	821	-
Colombia															
Natural resources	5 176	5 670	4 976	7 236	7 972	8 513	7 091	3 264	2 501	4 339	3 931	4 482	1 089	1 431	4 690
Manufactures	1 696	1 260	210	1 108	1 925	2 138	2 826	2 638	1 844	2 368	1 310	1 499	894	1 719	1 239
Services	3 693	1 105	1 244	6 303	5 143	5 560	6 252	5 718	9 513	6 994	6 058	8 008	5 476	6 411	10 939

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Costa Rica															
Natural resources	71	78	-3.2	-18.7	20	2	13	403	110	34	93	5	-60.1	-61.1	7
Manufactures	431	373	980	887	399	329	614	622	953	1 269	1 352	1 668	1 163	2 425	2 056
Services	1 696	875	530	1 548	1 847	2 392	2 271	1 726	1 138	1 481	1 038	1 119	650	887	994
Other	122	118	176	45	-7.8	19	27	1	3	-6.1	5	20	10	-20.5	-13.1
Dominican Republic															
Natural resources	357	758	240	1 060	1 169	93	-38.5	6	486	410	185	225	-6.5	536	377
Manufactures	574	280	566	355	1 257	404	607	368	413	1 365	540	356	441	307	600
Services	1 938	1 128	1 218	862	716	1 494	1 640	1 831	1 508	1 796	1 811	2 440	2 125	2 354	3 034
Ecuador															
Natural resources	265	58	189	380	243	274	724	628	509	193	878	524	525	116	-136.8
Manufactures	198	118	120	122	136	138	108	264	38	144	105	110	37	194	37
Services	595	133	-143.1	142	189	315	-59.9	431	217	293	406	345	533	338	888
El Salvador															
Natural resources	31	9	1	-0.6	-	-	-	-	-	-	-	-	-	-	-
Manufactures	28	92	-65.3	149	-47.3	289	82	291	268	458	586	51	68	19	-294.0
Services	479	243	-224.8	66	488	-149.3	246	80	80	374	159	553	252	256	166
Other (maquila)	365	21	59	4	29	35	-22.5	28	-1.4	58	81	33	-28.3	38	34
Guatemala															
Natural resources	209	110	147	391	461	440	51	23	59	-49.6	-98.2	64	16	20	92
Manufactures	76	23	199	187	132	190	197	238	242	277	274	227	263	285	157
Services	447	383	290	711	644	789	1 159	963	881	804	713	660	571	3 110	1 035
Other	6	6	23	-69.2	33	60	37	8	-6.6	99	92	26	84	47	67
Guyana															
Natural resources	87	65	94	108	122	173	113	59	41	161	1 138	1 480	985	4 416	4 345
Manufactures	12	8	16	30	44	10	31	13	4	2	6	30	26	44	40
Services	62	77	70	92	113	17	44	17	5	41	12	6	32	10	9
Other	17	14	18	17	14	14	67	33	8	8	76	197	-	-	-

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Honduras															
Natural resources	4	10	84	62	41	70	72	64	-94.0	-67.0	57	9	6	62	94
Manufactures	267	98	341	392	426	325	667	385	430	635	-37.4	-110.3	70	119	-23.5
Services	736	402	545	560	591	665	678	755	803	607	942	600	343	557	753
Jamaica															
Natural resources	152	54	31	57	107	87	56	82	118	237	403	342	65	35	29
Manufactures	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Services	453	292	155	93	100	155	139	369	371	214	106	120	171	163	188
Other	832	195	42	68	206	303	387	474	439	438	266	203	90	122	102
Mexico															
Natural resources	4 788	1 364	1 557	1 303	3 038	6 011	2 922	1 975	1 332	2 013	1 963	2 218	1 882	5 161	2 128
Manufactures	8 860	8 128	14 579	11 837	10 010	31 069	19 054	18 609	18 309	15 592	16 184	15 921	11 284	12 524	13 710
Services	15 855	8 357	11 054	12 492	8 721	11 275	8 376	15 359	11 548	16 412	15 953	16 438	15 040	13 869	20 378
Nicaragua															
Natural resources	57	47	77	191	123	272	109	32	-11.8	29	105	136	-	-	-
Manufactures	122	70	108	226	302	234	246	280	378	234	110	25	-	-	-
Services	447	318	323	550	347	350	378	501	385	541	438	219	-	-	-
Other	-	-	-	-	22	125	151	137	147	232	184	124	-	-	-
Panama															
Natural resources	-59.0	-33.9	77	94	1 164	468	27	1 679	730	2 043	1 527	918	-346.3	-114.5	...
Manufactures	161	104	-113.8	298	520	142	250	-7.6	221	316	27	117	-69.9	234	...
Services	2 106	1 190	2 760	2 761	1 526	2 957	4 182	2 885	3 795	1 818	3 466	2 885	566	1 807	...
Paraguay															
Natural resources	3	16	7	43	64	109	63	-129.4	138	6	-48.1	-3.7	-43.0	30	-
Manufactures	114	2	373	264	177	-18.7	-1.3	134	161	187	177	307	44	121	-
Services	192	75	248	367	527	410	602	439	342	147	35	29	109	41	-

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Uruguay															
Natural resources	604	253	329	383	435	342	43	42	182	-88.9	-43.0	-61.1	55	98	-
Manufactures	261	242	131	190	568	507	677	163	-759.1	-90.9	200	481	506	1 420	-
Services	1 068	1 027	1 037	1 482	1 035	3 373	1 441	883	-1 205.6	-436.5	-115.5	1 625	202	802	-
Other	238	71	820	572	36	32	32	20	29	-9.4	-22.1	41	-4.8	-19.2	-
Total															
Natural resources	29 986	20 180	37 422	34 572	46 136	46 841	27 967	26 087	18 008	15 932	19 635	23 672	11 885	16 578	21 009
Manufactures	29 763	21 113	49 133	53 878	58 620	80 700	77 712	65 314	58 390	44 122	54 250	46 063	29 007	27 635	37 371
Services	53 114	31 205	38 491	75 580	70 367	68 970	82 991	78 638	61 408	64 354	57 848	55 773	44 453	62 425	67 483
Other	1 851	1 108	1 955	-537.7	3 725	3 467	1 779	1 373	3 649	4 817	1 692	3 872	1 492	1 242	448

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as at 30 June 2023.

^a Data are compiled using the methodology of International Monetary Fund (IMF), *Balance of Payments and International Investment Position Manual: Sixth Edition (BPM6)*, Washington, D. C., 2009, except in the case of Costa Rica, Honduras, Mexico, Panama and Paraguay. The methodology of the fifth edition (2004) is used in part of the series for Ecuador (2008–2015).

^b According to data from the Central Bank of the Argentine Republic.

^c Gross FDI flows, excluding divestments.

^d Data do not include reinvested earnings.

Table I.A1.3Latin America and the Caribbean: FDI inflows by country or territory of origin, 2007–2022^a
(Millions of dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Argentina^b																
Spain	2 191	812	1 248	1 166	217	2 835	2 354	-2 323	3 310	1 275	...	...	...	...	...	...
Panama	592	1 153	107	476	840	3 170	2 345	2 629	1 621	477	...	...	...	...	...	...
Venezuela (Bolivarian Republic of)	103	372	664	48	-8	450	1 249	722	329	332	...	...	...	...	...	...
Bermuda	200	116	515	730	273	403	369	336	65	151	...	...	...	...	...	...
Chile	560	862	245	1 080	1 085	1 255	590	838	929	120	...	...	...	...	...	...
Samoa	229	256	-107	368	167	-65	-79	18	276	95	...	...	...	...	...	...
Mexico	549	545	123	309	407	611	-94	312	381	68	...	...	...	...	...	...
Germany	385	342	317	578	221	525	927	749	528	62	...	...	...	...	...	...
Bolivia (Plurinational State of)^c																
Peru	35	26	40	82	12	56	102	442	-5	247	13	145	37	121	254	217
Spain	50	25	145	271	235	364	676	537	369	164	167	208	274	64	159	157
Sweden	242	339	22	169	280	178	347	15	79	-13	413	212	40	-154	286	139
Netherlands (Kingdom of the)	20	20	10	1	5	31	15	3	0	-13	-3	47	45	60	74	104
Bermuda	1	19	14	10	9	31	17	-4	-1	-7	12	10	28	8	8	52
Brazil^d																
Netherlands (Kingdom of the)	6 840	3 136	3 803	2 762	18 693	15 365	23 614	24 650	23 907	23 885	8 327	18 416	6 742	5 024	-1 555	14 199
United States	2 851	2 207	1 277	7 180	4 531	20 926	10 715	11 530	10 159	8 614	14 820	10 310	7 698	10 399	11 963	13 786
France	1 118	2 167	1 895	3 007	4 352	2 827	2 981	3 947	-477	3 347	4 656	3 171	4 070	2 615	723	4 795
Spain	1 732	2 594	3 016	632	9 965	2 450	2 180	6 356	5 311	2 482	753	2 979	2 231	1 543	-632	3 266
Chile	690	-8	971	1 459	1 686	2 210	3 316	1 385	726	418	1 395	857	3 675	596	936	3 067
Hong Kong, China	13	35	34	810	2 187	151	431	308	272	226	1 082	944	216	83	2 185	2 623
United Kingdom	816	582	990	1 451	3 302	2 606	1 745	1 904	1 855	-1 735	1 299	592	2 899	-1 181	133	2 455
Norway	255	184	671	1 322	1 014	810	450	462	2 461	2 019	895	1 467	2 413	981	2 219	2 060

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Chile																
Italy	0	0	316	392	268	25	-138	58	69	2 495	17	1 043	2 094	258	7 409	...
Canada	0	0	423	515	3 244	2 227	2 430	3 129	-1 226	326	1 104	2 661	1 348	1 882	2 832	...
Belgium	0	0	84	74	12	366	373	337	0	182	-53	-166	160	181	2 798	...
Netherlands (Kingdom of the)	0	0	2 036	-847	1 313	3 537	6 496	2 098	1 796	531	332	1 216	1 779	923	2 394	...
United Kingdom	0	0	23	1 042	1 598	2 462	-325	1 191	2 915	926	2 332	3 179	1 333	1 950	1 476	...
Colombia																
United States	2 697	2 874	2 343	1 593	2 154	2 476	2 838	2 240	2 123	2 099	2 172	2 410	2 475	1 843	1 553	4 976
Spain	572	1 040	830	113	1 164	628	884	2 214	1 324	1 463	2 612	1 677	2 536	1 709	1 418	2 737
Panama	839	1 141	789	1 368	3 508	2 395	2 040	2 436	1 650	1 433	1 429	1 215	968	598	618	1 982
Anguilla	1 304	1 224	920	337	482	598	856	-163	-191	-237	35	295	500	11	313	1 380
Switzerland	122	140	166	180	994	698	2 096	2 804	958	731	741	877	1 154	583	1 057	955
United Kingdom	1 580	1 505	1 400	949	1 408	1 357	1 400	1 088	718	879	1 260	1 248	989	285	411	934
Costa Rica																
United States	803	1 352	1 008	1 107	1 499	907	449	796	1 263	764	1 611	1 631	1 962	1 163	2 547	2 230
Switzerland	35	79	-36	68	5	-3	-7	36	-43	40	117	122	54	-15	71	287
Colombia	30	49	6	98	138	104	57	170	135	84	195	69	104	37	206	92
Mexico	69	16	5	40	172	225	160	234	114	115	136	85	94	15	10	61
Spain	30	119	68	28	247	301	211	270	95	119	111	21	44	49	60	36
Germany	29	51	9	20	9	-11	29	40	60	39	-27	1	25	13	88	30
Dominican Republic																
United States	536	360	455	1 055	499	252	374	321	405	356	732	709	937	730	1 410	1 521
Mexico	-124	1 055	273	433	73	-32	6	244	-19	118	-45	-80	609	337	392	394
Canada	113	383	773	696	1 126	851	143	158	91	480	473	329	259	80	380	366
Spain	605	181	151	203	137	128	33	7	32	281	206	288	355	194	213	347

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Ecuador																
Uruguay	2	-37	-13	40	3	6	115	62	43	0	61	90	27	62	2	772
China	85	47	56	45	80	86	94	79	114	62	98	61	28	58	76	59
Spain	85	190	51	-17	52	50	71	67	71	102	81	169	149	235	-28	43
Mexico	-40	313	621	279	70	83	91	4	2	8	7	62	6	-2	37	37
United States	50	-29	-607	-535	12	94	42	10	186	88	35	60	74	87	83	31
Netherlands (Kingdom of the)	8	-8	-4	11	7	11	48	76	293	390	42	154	90	-18	-19	31
El Salvador																
Mexico	0	0	0	-49	48	99	13	-36	2	-80	35	74	33	-83	-37	152
United States	499	129	74	-99	23	3	31	116	248	49	24	354	215	-24	142	77
Honduras	0	0	0	-4	0	31	-1	8	-14	46	157	-11	-12	29	59	46
Guatemala																
United States	0	224	132	280	151	232	207	372	359	299	263	292	236	96	121	261
Colombia	0	15	18	18	184	50	194	161	129	124	234	154	176	228	337	254
Luxembourg	0	36	19	1	10	18	-5	73	70	63	22	23	31	41	2 248	221
Mexico	0	75	44	79	97	98	231	181	111	202	203	102	108	-13	167	193
Panama	0	9	5	9	15	28	9	27	53	19	-24	52	24	178	209	139
Honduras	0	3	31	-35	16	23	61	31	62	31	14	34	35	26	41	58
Republic of Korea	0	4	20	52	45	35	104	63	38	48	86	40	26	15	-22	41
Honduras																
Panama	22	16	1	14	16	22	63	152	232	273	156	188	89	56	132	237
United States	460	449	92	185	141	173	128	-256	140	-4	564	-15	-43	248	110	191
Colombia	0	0	0	0	20	22	31	128	97	99	31	106	105	156	169	160
Guatemala	15	44	14	61	44	52	37	88	60	158	56	40	121	72	133	60
Spain	0	3	0	-1	2	2	4	4	1	0	1	9	2	-4	-7	36
El Salvador	9	3	11	17	21	25	26	22	16	20	5	17	26	3	16	22

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Mexico																
United States	15 281	11 431	7 775	10 828	13 555	9 765	16 830	10 415	18 271	11 017	15 510	11 731	12 347	11 005	13 326	20 514
Canada	1 685	4 546	2 154	1 970	1 335	1 465	5 108	2 982	1 223	2 586	3 929	4 805	3 131	3 420	3 287	3 696
Argentina	1 927	113	9	-7	155	437	82	356	512	294	350	1 095	615	664	-464	2 321
Japon	710	899	708	1 204	846	2 019	1 694	2 563	2 168	2 012	2 425	2 289	1 532	1 338	1 367	2 171
United Kingdom	572	993	56	481	291	388	1 452	296	900	489	200	314	832	790	1 242	1 702
Spain	4 427	5 063	2 464	3 826	2 586	-1 555	-151	3 712	3 672	3 407	2 369	4 100	4 308	4 016	4 395	1 590
Republic of Korea	279	731	162	362	497	468	473	612	1 013	1 126	259	705	175	609	718	650
Nicaragua																
United States	84	126	88	88	159	121	244	...	...	...	...	...	...	...	...	...
Mexico	128	164	48	90	115	149	125	...	...	...	...	...	...	...	...	...
Venezuela (Bolivarian Republic of)	47	132	147	29	45	210	108	...	...	...	...	...	...	...	...	...
Panama	5	4	1	1	34	78	77	...	...	...	...	...	...	...	...	...
Spain	45	59	25	33	116	-19	74	...	...	...	...	...	...	...	...	...
Panama																
Colombia	134	60	135	82	486	9	29	1 162	659	913	446	856	780	357	596	...
Switzerland	146	122	301	444	216	152	232	244	161	232	547	-41	-13	-166	353	...
Netherlands (Kingdom of the)	22	420	0	126	-114	244	-2	109	398	-152	-26	266	181	108	247	...
Germany	8	2	13	15	106	113	92	45	14	-5	43	-7	96	-88	130	...
Mexico	60	69	154	-9	171	-51	367	20	95	-10	224	2	-37	-177	118	...
Brazil	5	59	33	-2	20	0	0	37	154	64	-50	-170	77	-267	104	...
China	1	6	3	-3	1	2	2	41	33	125	52	31	42	-65	97	...

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Paraguay																
United Kingdom	-6	12	22	6	-4	32	28	53	57	97	-6	-10	-222	-5	146	...
Brazil	28	38	14	83	59	163	146	151	95	-14	91	53	93	73	139	...
Colombia	0	1	1	0	-1	0	1	18	22	19	21	22	25	16	87	...
Chile	11	18	12	30	33	-18	38	33	-9	12	0	9	58	18	44	...
Mexico	-19	-71	0	-8	0	92	-10	39	-4	28	19	8	10	0	29	...
Venezuela (Bolivarian Republic of)	53	11	31	208	70	55	47	44	31	16	8	29	12	11	30	141
Trinidad and Tobago																
United States	574	403	469	363	-12	-16	-520	-153	13	26	0	-15	74	1 008	-402	1 337
United Kingdom	159	146	152	118	-222	-292	-206	-706	180	232	-455	-353	119	257	373	-2 232
Uruguay																
Brazil	56	86	183	110	108	331	515	-252	534	-884	167	-1 201	468	-1 643	4 432	...
Argentina	282	373	534	432	588	195	308	-148	159	-151	417	-91	133	-394	576	...
Singapore	0	0	0	0	0	58	104	-165	240	106	532	372	110	216	398	...
Luxembourg	0	3	4	12	10	-726	102	-140	67	281	-82	-53	-2 012	1 095	385	...
Spain	81	153	232	55	75	208	437	886	-69	568	737	3 814	443	278	338	...
Bermuda	0	0	7	223	-59	-55	-146	-334	-270	258	-77	-389	-351	69	173	...

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as at 30 June 2023.

^a Data are compiled using the methodology of International Monetary Fund (IMF), *Balance of Payments and International Investment Position Manual: Sixth Edition (BPM6)*, Washington, D. C., 2009, except in the case of Costa Rica, Honduras, Mexico, Panama and Paraguay. The methodology of the fifth edition (2004) is used in part of the series for Ecuador (2007–2015).

^b According to data from the Central Bank of the Argentine Republic.

^c Gross FDI flows, excluding divestments.

^d Data do not include reinvested earnings.

Table I.A1.4

Latin America and the Caribbean: FDI inflows by component, 2007–2022

(Millions of dollars)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Antigua and Barbuda																
Equity	328	149	79	96	61	110	65	67	94	94	156	209	128	93	255	193
Intercompany loans	0	0	1	1	2	6	29	-25	-6	-4	7	3	9	15	-18	-6
Reinvested earnings	12	12	5	5	5	22	7	5	26	8	-11	-8	-9	-31	7	8
Argentina																
Equity	2 578	4 552	2 133	2 504	4 508	4 861	2 784	-112	1 319	3 716	1 958	3 259	2 231	1 373	854	826
Intercompany loans	1 846	4 777	-1 010	3 507	2 600	3 120	-783	-945	2 382	-4 732	2 422	1 424	167	839	1 112	8 807
Reinvested earnings	2 050	396	2 894	5 322	3 732	7 343	7 821	6 121	8 058	4 276	7 137	7 034	4 251	2 672	4 937	5 775
Bahamas																
Equity	887	1 032	753	960	971	575	868	617	408	511	351	573	373	417	252	252
Intercompany loans	736	481	-107	137	438	458	723	2 934	304	749	550	374	238	480	799	1 003
Reinvested earnings	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barbados																
Equity	420	340	140	393	227	230	135	307	398	82	295	321	311	310	215	...
Intercompany loans	24	231	103	41	324	113	-110	-76	-190	-260	-192	-165	-154	-100	-27	...
Reinvested earnings	32	45	13	13	-95	184	92	361	210	447	102	85	58	53	49	...
Belize																
Equity	100	141	80	80	103	193	101	145	57	29	2	94	57	68	28	118
Intercompany loans	13	8	6	2	1	0	0	0	0	0	0	0	0	0	0	0
Reinvested earnings	30	21	23	15	-8	-4	-6	7	7	15	22	24	37	8	13	16
Bolivia (Plurinational State of)^a																
Equity	27	45	0	1	5	19	17	313	20	406	152	70	126	36	70	52
Intercompany loans	654	850	177	141	130	282	331	889	741	568	417	438	345	350	444	235
Reinvested earnings	272	407	509	793	899	1 204	1 682	919	405	127	640	397	103	-221	538	644

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Brazil																
Equity	26 074	30 064	19 906	40 117	54 782	52 836	42 152	47 501	49 520	44 512	53 950	40 992	42 878	28 118	29 998	36 584
Intercompany loans	18 505	20 652	11 575	13 470	16 451	22 541	38 346	39 040	22 851	25 440	4 886	20 840	5 543	4 209	-446	21 075
Reinvested earnings	...	...	...	28 803	31 194	17 192	-5 288	1 174	-7 632	4 342	10 049	16 330	20 753	5 459	16 887	33 843
Chile																
Equity	2 622	7 775	1 905	4 662	10 911	8 532	4 778	10 506	6 494	6 148	2 075	2 476	6 361	5 245	10 990	8 851
Intercompany loans	866	3 086	1 144	3 856	3 233	11 067	8 714	9 619	9 785	2 552	-943	-795	1 846	936	415	1 237
Reinvested earnings	7 058	7 951	9 701	6 332	12 225	12 203	7 629	5 404	1 488	2 663	4 105	6 262	5 372	5 267	4 528	10 777
Colombia																
Equity	7 024	7 861	4 903	3 733	8 282	9 091	9 755	9 181	7 423	6 399	8 053	4 558	7 285	3 386	3 269	7 807
Intercompany loans	-121	47	731	-635	1 872	1 239	2 368	2 493	2 006	4 672	1 794	1 604	2 411	2 527	2 485	2 680
Reinvested earnings	1 983	2 657	2 400	3 332	4 493	4 710	4 087	4 495	2 191	2 787	3 854	5 137	4 293	1 546	3 807	6 381
Costa Rica																
Equity	1 377	1 594	1 050	818	959	852	1 704	1 352	1 180	414	685	769	507	461	900	652
Intercompany loans	-2	39	-174	150	711	1 136	714	912	665	1 153	573	794	574	511	693	425
Reinvested earnings	521	446	471	497	509	708	788	978	1 110	1 054	1 667	1 452	1 638	1 130	2 000	2 596
Dominican Republic																
Equity	1 616	2 199	704	667	804	1 256	233	955	995	1 126	2 403	1 513	1 583	1 688	1 629	2 257
Intercompany loans	-446	278	1 096	554	468	904	471	-166	18	66	-162	-141	225	-330	-82	327
Reinvested earnings	498	394	365	803	1 005	982	1 286	1 420	1 192	1 214	1 331	1 164	1 213	1 201	1 650	1 425
Dominica																
Equity	28	39	39	28	25	45	16	6	8	36	26	60	52	39	37	27
Intercompany loans	9	9	13	13	7	9	4	2	-7	0	15	0	-2	0	-3	-1
Reinvested earnings	10	9	6	3	2	4	5	4	6	6	-19	18	13	-17	0	2
Ecuador																
Equity	151	229	278	265	252	227	424	848	985	679	521	470	431	837	579	1 171
Intercompany loans	-368	530	-225	-312	66	40	-7	-390	51	-115	-52	687	379	100	-73	-487
Reinvested earnings	411	298	256	213	328	301	310	314	287	200	161	232	170	157	142	145

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Grenada																
Equity	140	128	97	56	39	29	109	58	122	85	122	123	149	130	118	120
Intercompany loans	17	1	2	3	1	0	0	14	-2	20	-6	24	5	-12	-2	4
Reinvested earnings	15	12	5	5	5	5	5	12	34	4	38	40	49	19	23	36
Guatemala																
Equity	260	177	-33	168	405	448	288	439	772	157	112	212	31	53	2209	53
Intercompany loans	-30	153	175	-136	149	318	382	269	-255	392	250	-57	46	40	34	166
Reinvested earnings	515	408	381	626	666	505	809	734	714	625	768	825	899	841	1 219	1 133
Honduras																
Equity	220	568	84	29	284	310	174	248	137	201	474	120	27	-18	-333	13
Intercompany loans	203	-40	65	378	56	52	250	540	342	-34	79	614	231	-73	-60	257
Reinvested earnings	505	479	360	562	674	697	645	917	838	981	388	647	689	314	1 193	812
Mexico																
Equity	18 027	13 053	11 008	15 636	9 699	4 316	22 039	5 763	13 449	10 992	11 940	11 323	13 529	6 742	13 665	17 960
Intercompany loans	4 483	7 370	3 278	9 583	3 439	3 251	10 392	4 639	10 846	17 225	9 193	13 220	-1 802	8 642	7 154	4 799
Reinvested earnings	8 510	9 329	5 365	5 306	10 756	10 664	18 497	18 037	11 955	10 682	11 981	13 313	18 179	16 135	12 659	16 173
Nicaragua																
Equity	0	0	0	0	0	567	360	686	595	446	630	496	247	226	359	308
Intercompany loans	0	0	0	0	0	29	321	235	145	209	55	40	109	44	247	39
Reinvested earnings	0	0	0	0	0	180	285	157	227	335	351	302	147	477	615	946
Panama																
Equity	719	918	898	948	759	1561	1614	687	77	923	-24	31	-25	-668	119	-123
Intercompany loans	178	136	105	540	1 224	682	550	343	1 599	2 258	2 211	3 557	2 756	-1 108	-494	1 253
Reinvested earnings	879	1 348	257	874	1 150	737	1 779	3 429	3 382	2 404	1 790	1 900	1 720	-700	2 135	1 383
Paraguay																
Equity	22	130	197	112	629	350	445	598	370	320	368	187	282	273	226	157
Intercompany loans	282	-11	-91	292	101	232	-290	31	244	295	178	-265	291	64	-207	14
Reinvested earnings	139	223	49	303	-127	191	211	262	-33	125	-23	296	-170	-242	188	303

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Peru																
Equity	733	2 981	1 828	2 445	896	5 387	3 013	-1 786	4 060	2 574	1 944	1 763	2 965	486	-84	1 161
Intercompany loans	924	656	-782	693	2 117	1 459	2 300	2 460	401	906	173	-811	1 404	175	570	1 130
Reinvested earnings	3 835	3 287	5 385	5 317	4 670	7 337	4 258	3 589	2 876	3 325	5 297	4 921	392	129	6 933	8 557
Saint Kitts and Nevis																
Equity	135	178	132	116	107	106	137	161	132	113	34	39	78	14	19	26
Intercompany loans	3	3	1	1	1	2	0	-7	-7	0	8	-5	2	-5	2	-7
Reinvested earnings	2	2	2	2	4	1	1	2	3	9	6	6	-18	-3	5	-3
Saint Lucia																
Equity	254	135	135	109	80	54	76	25	83	136	68	64	40	44	57	43
Intercompany loans	8	21	13	13	15	16	10	2	11	11	15	-31	17	10	8	9
Reinvested earnings	15	11	3	4	5	8	9	38	58	14	7	12	18	-7	21	15
Saint Vincent and the Grenadines																
Equity	102	142	100	91	79	112	157	99	123	99	167	62	77	71	149	74
Intercompany loans	8	8	8	2	2	2	2	15	4	-15	11	-10	2	3	5	5
Reinvested earnings	11	9	2	4	4	1	1	10	-3	-14	-13	-12	-11	-8	7	7
Suriname																
Equity	0	0	0	0	0	0	0	0	0	0	-205	-184	-276	-265	-295	-212
Intercompany loans	-247	-231	-93	-248	-51	113	71	-21	186	254	55	89	96	-32	31	55
Reinvested earnings	...	...	...	0	121	11	69	27	1 291	1 519	246	226	264	298	131	152
Trinidad and Tobago																
Equity	554	2 322	426	309	517	-251	-1 899	518	-223	-268	-367	-790	137	669	-1 040	-332
Intercompany loans	-21	-16	-12	-11	-476	-1 653	769	143	400	245	-104	90	47	387	105	-582
Reinvested earnings	297	495	296	251	0	0	0	0	0	0	0	0	0	0	0	0
Uruguay																
Equity	550	1 012	990	1 617	1 412	1 242	2 057	1 708	1 422	1 019	646	277	636	905	741	1 045
Intercompany loans	448	540	82	8	263	2 676	-1 704	1 569	2 501	-924	854	332	1 445	-187	-398	4 806
Reinvested earnings	331	554	457	664	828	2 476	634	809	-1 250	-610	1 187	1 117	-611	-192	3 314	3 475

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Venezuela (Bolivarian Republic of)																
Equity	-806	302	-3 348	-1 319	-495	-307	-79	67	123	21	20	20	...	...	...	...
Intercompany loans	773	-11	367	1 457	2 752	3 292	1 784	-1 605	1 051	622	-1 440	-697	...	...	...	...
Reinvested earnings	3 321	2 336	1 998	1 436	3 483	2 988	975	510	-405	425	1 352	1 563	...	...	...	...
Total																
Equity	64 143	78 064	44 484	74 641	96 300	92 749	91 524	80 957	90 142	80 969	86 555	69 106	80 222	50 733	64 986	79 083
Intercompany loans	28 744	39 565	16 446	33 500	35 896	51 387	65 638	62 913	56 068	51 552	20 847	41 152	16 231	17 486	12 294	47 244
Reinvested earnings	31 252	31 126	31 205	61 486	76 529	70 651	46 590	49 735	27 034	36 964	52 412	63 283	59 440	34 285	63 004	94 602

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as at 30 June 2023.

^a Data are compiled using the methodology of International Monetary Fund (IMF), *Balance of Payments and International Investment Position Manual: Sixth Edition (BPM6)*, Washington, D. C., 2009, except in the case of the Bolivarian Republic of Venezuela, Guyana, Paraguay and Peru. The methodology of the fifth edition of (2004) is used in part of the series for the following countries: Antigua and Barbuda, Dominica, Grenada, Plurinational State of Bolivia, Saint Kitts and Nevis, and Saint Lucia (2003–2013); Argentina (2003–2005); Dominican Republic (2003–2009); Ecuador (2003–2015); Guatemala (2003–2007); Honduras (2003–2012); Mexico and Nicaragua (2003–2005); Panama (2003–2014); Suriname (2003–2016); Trinidad and Tobago (2003–2010); and Uruguay (2003–2011).

Table I.A1.5

Latin America and the Caribbean: FDI stock by country, 2001–2022

(Millions of dollars and percentages of GDP)

	2001	2005	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2001	2005	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Argentina	79 504	55 139	98 706	88 338	89 716	79 773	74 868	80 700	72 589	70 458	85 269	100 119	116 698	27	27	17	14	16	12	13	13	13	16	22	21	19
Belize	355	608	1 738	1 833	1 986	2 051	2 095	2 119	2 237	2 331	2 409	2 538	2 671	32	43	91	90	93	93	93	93	97	96	116	102	90
Bolivia (Plurinational State of)	5 893	4 905	8 809	10 992	11 785	11 598	11 565	12 241	11 835	11 710	10 276	10 586	10 131	72	51	33	36	36	35	34	33	29	29	28	26	24
Brazil	121 949	181 344	731 175	724 781	725 872	568 226	703 328	767 757	737 894	873 979	765 401	901 421	1 027 977	22	20	30	29	30	31	39	37	38	47	52	55	54
Chile	...	78 089	204 775	210 344	222 558	222 984	236 752	257 748	254 160	257 709	260 715	256 468	274 633	...	64	77	76	86	92	95	93	86	92	102	81	91
Colombia	15 377	36 987	112 949	128 213	141 810	149 073	164 428	179 334	188 833	204 916	212 299	219 677	233 919	16	25	30	34	37	51	58	58	56	63	78	69	68
Costa Rica	3 600	7 510	22 960	26 938	30 788	34 278	37 309	40 788	44 524	47 753	50 129	53 721	57 380	23	37	49	53	59	61	63	67	71	74	80	83	81
Dominican Republic	...	...	25 143	26 660	29 035	31 309	33 820	37 396	40 209	43 038	45 499	48 849	52 810	...	...	41	43	43	44	45	47	47	48	58	52	46
Ecuador	6 876	9 861	13 072	13 799	14 571	15 894	16 671	17 300	18 689	19 668	20 763	21 410	22 240	28	24	15	15	14	16	17	17	17	18	21	20	19
El Salvador	2 252	4 167	8 763	8 895	9 314	9 995	10 178	10 351	10 877	11 591	11 832	12 811	12 863	18	28	41	40	41	43	42	41	42	43	47	44	40
Guatemala	...	3 319	7 071	9 094	10 872	12 228	13 850	15 099	15 587	16 670	17 574	21 367	22 507	...	12	14	17	19	20	21	21	21	22	23	25	24
Haiti	99	150	900	1 061	1 160	1 265	1 370	1 745	1 850	1 925	...	...	...	2	2	7	7	8	9	10	11	12	14	...	...	...
Honduras	1 585	2 870	9 646	10 671	12 018	13 564	14 900	15 461	16 503	17 029	17 421	18 252	19 104	21	29	52	58	61	65	69	67	69	68	73	64	60
Jamaica	3 931	6 918	12 119	12 664	13 246	14 171	15 077	15 829	16 557	17 222	17 487	17 808	18 126	43	62	82	89	95	100	107	107	105	109	127	122	106
Mexico	...	212 374	461 350	507 876	502 688	478 453	486 671	544 480	570 381	616 321	592 508	641 678	702 040	...	24	38	40	38	41	45	47	47	49	54	50	50
Nicaragua	1 565	2 461	5 154	5 892	6 471	7 208	7 935	8 620	9 056	9 240	9 986	11 206	12 500	29	39	49	54	54	57	60	63	70	73	79	79	80
Panama	7 314	10 167	26 762	30 677	35 135	39 629	44 839	55 110	59 869	65 937	62 914	62 118	64 631	56	59	64	65	68	71	75	85	89	95	110	92	84
Paraguay	1 016	1 127	5 560	5 641	6 751	6 315	7 172	8 058	7 937	7 865	7 557	7 910	8 384	12	10	17	15	17	17	20	21	20	21	21	20	20
Peru	11 835	15 889	70 032	79 603	83 866	91 203	98 008	105 421	111 294	116 054	116 845	124 265	135 114	23	21	36	40	42	48	51	50	50	51	58	56	54
Suriname	...	...	1 035	1 232	1 397	1 477	1 894	2 034	2 173	2 266	2 275	2 144	2 142	...	...	19	22	25	29	57	57	54	54	55	66	59
Trinidad and Tobago	...	...	10 984	10 413	10 368	10 049	9 545	9 083	8 452	8 455	10 496	9 701	...	...	...	41	36	35	37	41	38	35	35	50	40	0
Uruguay	2 406	2 844	43 047	42 892	46 951	47 419	46 563	50 404	51 257	51 599	49 868	51 969	62 533	11	15	77	68	75	81	81	78	78	83	93	85	88
Venezuela (Bolivarian Republic of)	39 074	44 518	40 180	33 018	32 016	28 142	23 569	22 175	22 918	...	...	...	...	32	31	11	10	12	19	12	14	17	...	...	...	...
Total	304 630	681 246	1 921 932	1 991 526	2 040 372	1 876 304	2 062 404	2 259 255	2 275 684	2 473 738	2 369 523	2 596 017	2 858 403	15	26	32	33	34	37	41	41	43	49	55	53	51

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as at 30 June 2023.

Table I.A1.6

Latin America and the Caribbean: FDI outflows by country, 2002–2022

(Millions of dollars)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Antigua and Barbuda	14	13	15	17	2	2	2	4	5	3	4	6	6	14	38	12	-1	-11	2	-4	-11
Argentina	-627	774	676	1311	2439	1504	1391	712	965	1488	1055	890	1921	875	1787	1156	1726	1523	1177	1537	2076
Bahamas	40	72	169	143	333	459	410	217	150	524	158	277	2679	170	359	151	117	148	157	66	226
Barbados	25	25	54	157	44	82	73	27	345	556	39	40	-229	52	-194	-28	9	28	8	28	0
Belize	0	0	0	1	1	1	3	0	1	1	1	1	3	0	2	0	1	2	4	2	1
Bolivia (Plurinational State of)	3	3	3	3	3	4	5	-4	-29	0	77	-255	-33	-2	89	80	-84	48	-111	91	-336
Brazil	2 479	229	9 822	2 910	28 798	17 061	26 115	-4 552	26 763	16 067	2 083	15 644	20 607	3 134	14 693	21 341	2 025	22 820	-3 467	16 239	30 694
Chile	0	1 819	1 951	1 997	2 027	4 361	8 463	5 806	8 561	16 892	19 935	9 323	10 080	15 851	7 876	2 535	1 847	10 345	6 398	13 946	12 776
Colombia	857	938	192	4 796	1 268	1 279	3 085	3 505	5 483	8 420	-606	7 652	3 899	4 218	4 517	3 690	5 126	3 153	1 733	3 181	3 402
Costa Rica	132	152	206	150	219	430	197	274	318	405	894	804	424	414	493	273	581	24	459	447	701
Dominica	1	0	1	13	3	7	0	1	1	0	0	2	-2	-12	1	-1	0	0	0	0	0
El Salvador	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grenada	3	1	1	3	6	16	6	1	3	3	3	1	7	19	17	4	18	24	-19	-2	6
Guatemala	0	0	0	0	0	0	17	31	50	80	44	30	55	183	209	196	201	180	149	476	389
Honduras	7	12	-6	1	1	2	-1	4	-1	2	208	78	390	365	247	-94	485	419	-103	418	402
Jamaica	74	116	52	101	85	115	76	61	58	75	90	75	59	34	270	34	13	446	7	56	60
Mexico	-3 037	1 161	4 559	5 835	6 676	8 332	688	11 663	17 895	11 573	18 775	18 032	5 594	10 978	7 870	3 085	12 121	5 969	5 578	401	17 371
Panama	0	0	0	0	0	0	0	0	0	176	-274	331	329	1 091	933	-338	570	725	-2 535	131	-166
Paraguay	0	0	0	0	0	0	33	63	143	-10	-91	176	448	254	273	441	-1	-130	-24	112	251
Peru	0	-60	0	0	0	-66	-736	-411	-436	-343	2 308	237	837	-663	1 526	1 422	-790	-435	1 631	1 729	-448
Saint Kitts and Nevis	1	2	7	11	4	6	6	5	3	2	2	2	5	-5	-3	6	29	12	3	-2	23
Saint Lucia	5	5	5	4	4	6	5	6	5	4	4	3	-32	23	12	-6	-9	45	-6	-27	41
San Vicente y las Granadinas	0	0	0	1	1	2	0	1	0	0	0	0	5	8	-9	21	7	5	2	2	6
Suriname	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	12	92	1	-9	-13
Trinidad and Tobago	106	225	25	341	370	0	700	0	0	67	189	63	-18	128	-25	-12	65	114	98	768	1 173
Uruguay	-14	-15	-18	-36	1	-89	11	-16	60	7	4 154	-2 058	1 838	1 898	1 308	4 724	2 456	79	-491	1 893	6 051
Venezuela (Bolivarian Republic of)	1 026	1 318	619	1 167	1 524	-495	1 311	2 630	2 492	-370	4 294	752	1 024	-399	-1 041	-2 234	-661	0	0	0	0
Total	1 095	6 793	18 336	18 925	43 808	33 019	41 860	20 027	62 834	55 621	53 346	52 104	49 896	38 631	41 248	36 454	25 860	45 626	10 651	41 481	74 677

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official figures and estimates as at 30 June 2023.

CHAPTER



Foreign direct investment in non-renewable energies in Latin America and the Caribbean: challenges for the energy transition

Introduction

- A. The importance of non-renewable energy sources in the energy transition
- B. Geographically concentrated reserves and a market dominated by large corporations
- C. An industry that generates large foreign capital flows
- D. Challenges and opportunities for Latin America and the Caribbean
- E. Conclusions

Bibliography

Introduction

Internationally concerted efforts to rapidly mitigate climate change have generated major pressure to divest from the hydrocarbons sector. The commitments made by countries and firms to reduce their greenhouse gas (GHG) emissions, over the coming decades, have placed the search for renewable energy sources at the heart of their decarbonization strategies. However, in the face of rising energy prices driven mainly by the conflict between the Russian Federation and Ukraine, the energy transition debate has taken on a new dimension, related primarily to energy security.

Against this backdrop, despite international efforts to decarbonize the sector, it is projected that non-renewables will continue to be a significant source of energy in the coming decades, mainly because of their importance for energy security; and firms are likely to continue to invest in the exploration, refining and commercial exploitation of hydrocarbons. It is essential to assess investment trends in the sector, and the way Latin America and the Caribbean engages with this scenario, to understand how the region participates in global decarbonization initiatives and whether it is prepared for the uncertainties associated with the energy transition.

Although renewable energies in Latin America and the Caribbean have received substantial investment in recent years, the region's oil, natural gas and coal sectors continue to receive significant amounts of foreign direct investment (FDI). Both conventional and unconventional hydrocarbon deposits have been discovered in the region, such as the Stabroek blocks in Guyana, the pre-salt layer in Brazil and the Vaca Muerta oil shale deposits in Argentina; and these have represented a major source of capital inflows and stimulus for the recovery of economic activity. In Guyana, for example, FDI inflows driven by the hydrocarbons sector grew by 116% in 2021 relative to the previous year's level, representing 65% of GDP (ECLAC, 2021 and 2022).

The importance of petroleum assets in the region has also generated a substantial volume of cross-border mergers and acquisitions (M&A). In 2022, the oil, natural gas and coal sector generated the third largest number of M&A transactions in Latin America and the Caribbean, accounting for 21% of the total (while renewables ranked fifth with 5%). Investor interest has extended beyond existing assets, for many transnational firms have announced greenfield investment projects, albeit decreasingly until 2022. Since 2010, the amounts announced in renewable energy projects in the region have surpassed those of non-renewables, with the latter's share dwindling from 24% of total announcements in 2005, to just 5% in 2021. Nonetheless, an increase in announcements of oil, gas and coal projects in the region in 2022, spearheaded by a large project in Guyana, meant that they outweighed renewable energy announcements for the first time in over 10 years. As a result, it remains a leading sector in terms of future investment prospects in the region.

Investments in the sector are subject to uncertainties related to international commitments on transitioning to clean and renewable energy sources; the region's still incipient environmental and financial regulation; and energy security considerations —both global and regional. The foregoing scenario frames the analysis of this chapter on trends in FDI in the non-renewable energies sector in Latin America and the Caribbean, with a view to providing inputs for decision-making by the region's governments in relation to the energy transition. Countries that possess hydrocarbon resources face a trade-off between sustainable development and growth driven by the extraction of non-renewable resources.

This chapter analyses some of the factors that are relevant in addressing this problem. Section A provides a brief discussion on one of the greatest dilemmas in the global energy domain, and addresses the position of Latin America and the Caribbean in this regard: there is an urgent need to promote an energy transition to meet internationally established climate goals; but there is also growing global demand for energy and no capacity to satisfy this demand today from renewable sources. To complete this dilemma, an appetite to explore and produce fossil fuels still exists in countries

where the revenues to be extracted from such resources are of vital importance in overcoming the challenges of inclusive and fair development. Section B makes a brief overview of the sector at the global level, considering reserves and the production and consumption of non-renewable energies, and the value chain of the oil and natural gas industry,¹ followed by a presentation of the leading firms in the sector at the global and regional levels. Section C then analyses global and regional FDI trends in the sector; and, lastly, section D analyses the challenges and opportunities facing Latin America and the Caribbean—including the challenges posed by stranded assets and the need to consider carbon dioxide capture and storage technologies. This section also considers the best instruments to enable the exploitation of resources such as oil and natural gas to make a more significant contribution to productive development in the region.

A. The importance of non-renewable energy sources in the energy transition

1. Most final energy consumption is obtained from non-renewable sources

As their name suggests, non-renewable energy sources are finite or exhaustible, since they are being consumed faster than nature can replace them (EIA, 2022a; EPE, n.d.). Non-renewables include fossil fuels (mainly coal, oil, natural gas and their by-products), along with nuclear energy, which will not be considered in this analysis (see table II.1).

Table II.1
Energy sources

Non-renewables	Fossil sources	Coal
		Oil
		Heavy oil
		Tar sands
		Bituminous shale
		Natural gas
		Methane hydrates
	Nuclear energy	
Renewables	Hydropower	
	Solar energy	
	Wind energy	
	Biomass	
	Geothermal energy	
	Ocean energy	

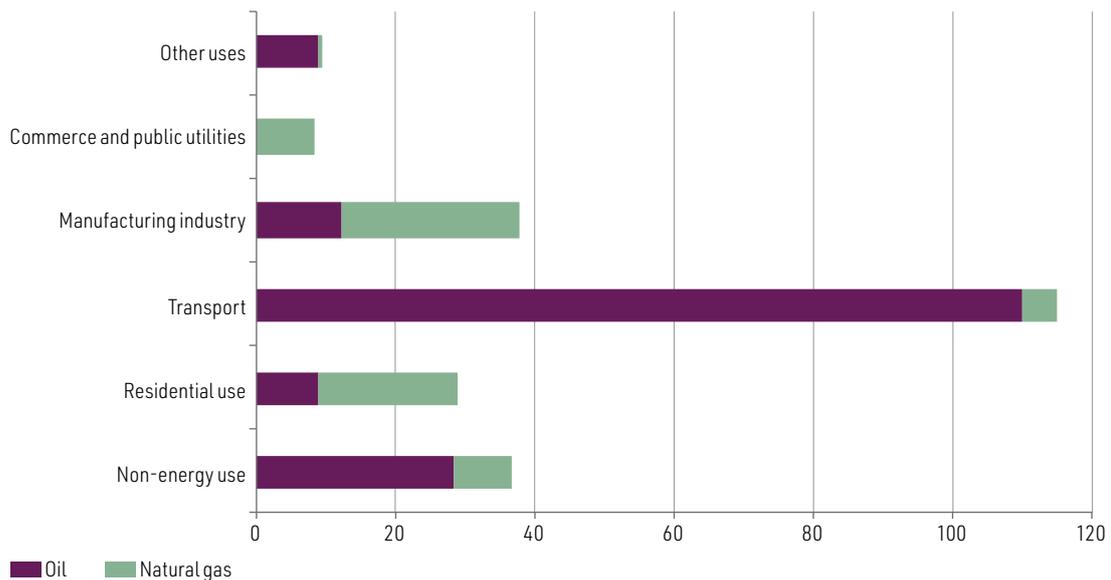
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Empresa de Pesquisa Energética (EPE), "Fontes de energia" [online] <https://www.epe.gov.br/pt/abcdenergia/fontes-de-energia> and G. J. Suppes and T. S. Storvick, *Sustainable Power Technologies and Infrastructure: Energy Sustainability and Prosperity in a Time of Climate Change*, Elsevier, 2016.

¹ Although global coal consumption increased by 6% in 2021 over the previous year, and is expected to grow by a further 1.2% in 2022 (reaching 8,025 Mt, which represents a record since 2013, according to the International Energy Agency (IEA, 2022d)) it is used relatively little as an energy source in Latin America and the Caribbean. Furthermore, although coal is a fossil fuel like oil and gas, it has different extraction methods and a completely different value chain, different market dynamics and regulatory frameworks governing its extractive production and consumption. For these reasons, the following sections will not analyse the coal value chain, nor consider the market dynamics of this fossil fuel.

Fossil fuels are the world's main energy source, not only because of their high energy yield and the rapid development and spread of exploration, production and distribution infrastructures (mining in the case of coal; or onshore and offshore platforms, power plants, pipelines, tankers, railways, roads, among others), but also because of their versatility of use and feasibility of transportation and storage. Fossil energy sources are used widely to generate electricity and heat, but also as fuel in combustion engines, as raw material for the petrochemical industry and in the production of synthetic nitrogen (EPE, n.d.; Smil, 1994). In 2019, transportation accounted for 65% of final consumption of oil and 7% of the consumption of natural gas. In manufacturing, oil and natural gas are used mainly to power industrial processes (7% of final consumption of oil and 38% in the case of natural gas); or else they serve as industrial inputs (“non-energy use”), primarily in the petrochemical industry (17% of final consumption of oil and 12% of natural gas) (IEA, 2021a; SBTi, 2020) (see figure II.1).

Figure II.1

Total oil and natural gas consumption by sector, 2019
(Exajoules)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Energy Agency (IEA), “Final consumption”, *Key World Energy Statistics 2021*, Paris, 2021.

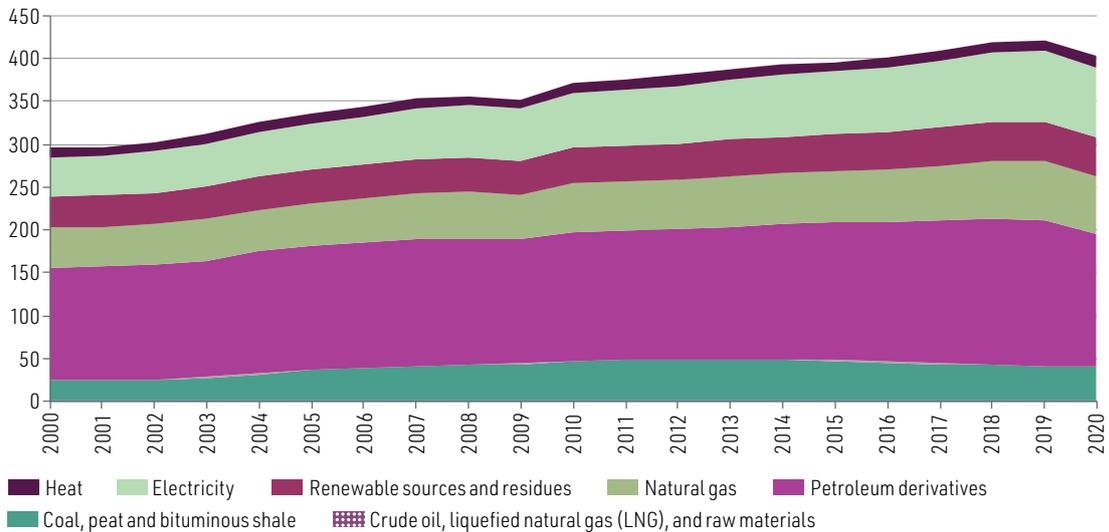
Note: One exajoule is equivalent to 277,778 GWh.

Fossil fuels are today's most heavily consumed energy source (see figure II.2). According to the International Energy Agency (IEA, 2022a), 65% of global energy consumption came directly from fossil sources in 2020, primarily oil derivatives (38% of total consumption), natural gas (17%) and coal, peat and bituminous shale (10%). Electricity production represented 20% of world energy consumption in the same year, and renewable energies accounted for 17%.

Fossil sources are also very important. In 2020, 62% of electricity was generated from fossil fuels, 28% from renewables and 10% from nuclear energy (see figure II.3A). In the same year, the electricity sector absorbed 59% of all coal used globally, along with 34% of natural gas, 4% of oil, 52% of all renewables and nearly 100% of nuclear energy (IEA, 2022d).

Figure II.2

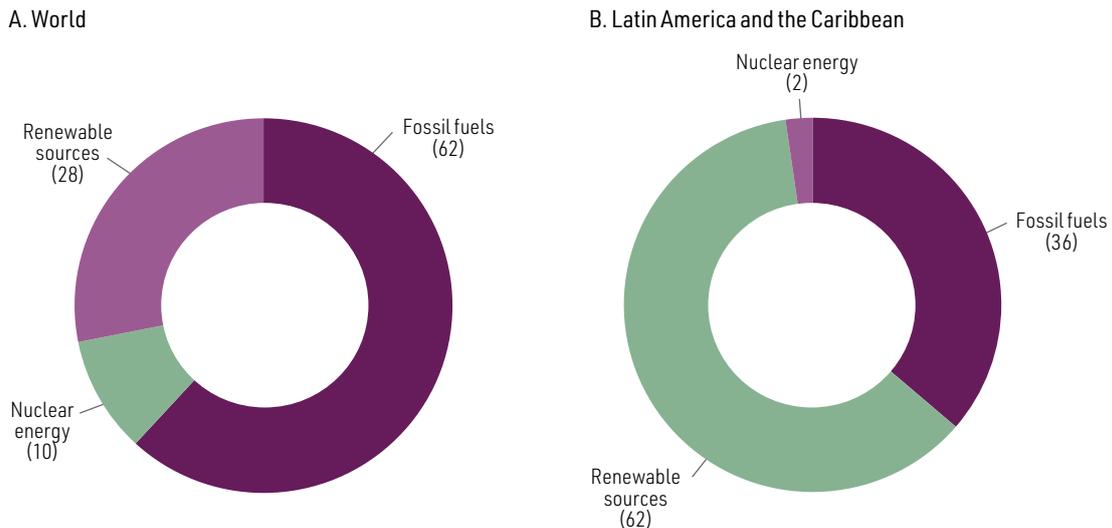
Total final energy consumption by energy product, 2000–2020
(Exajoules)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of "World energy balances highlights", 2022 [online] <https://www.iea.org/data-and-statistics/data-product/world-energy-balances-highlights>.

Figure II.3

World and Latin America and the Caribbean: energy sources used for electric power generation, 2020
(Percentages of gigawatt hours)

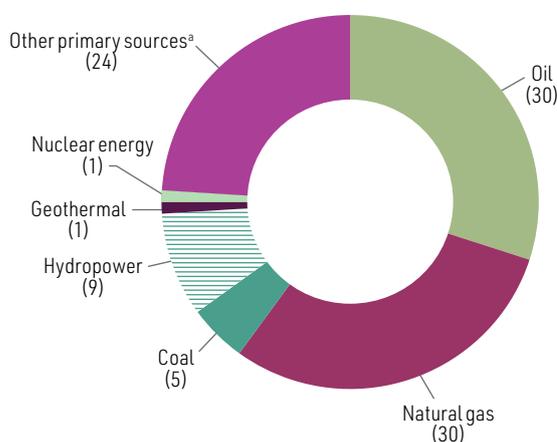


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of "World energy balances highlights", 2022 [online] <https://www.iea.org/data-and-statistics/data-product/world-energy-balances-highlights> and Latin American Energy Organization (OLADE), *Panorama Energético de América Latina y el Caribe 2021*, Quito, 2022.

In contrast, in Latin America and the Caribbean, 62% of electricity is generated from renewables, mainly hydropower, which accounts for 46% of the total (see figure II.3B). Apart from the prominence of renewables in power generation, the predominance of the various sources in the energy balance is broadly the same as in the rest of the world: in 2020, 65% of the energy supplied came from fossil sources, with 30% derived from oil, 30% from natural gas and 5% from coal (OLADE, 2022) (see figure II.4).

Figure II.4

Latin America and the Caribbean: total energy supply by source, 2020
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Latin American Energy Organization (OLADE), *Panorama Energético de América Latina y el Caribe 2021*, Quito, 2022.

^a Biogas, vegetable waste, sugarcane products, firewood, solar and wind energy.

2. A secure energy transition requires planning and major investments

Compounding the fact that fossil sources are finite, the use of fossil energy is associated with high rates of greenhouse gas (GHG) emissions into the atmosphere. According to the Intergovernmental Panel on Climate Change (IPCC, 2022a), 64% of global anthropogenic emissions² in 2019 came from carbon dioxide (CO₂) produced by the burning of fossil fuels and industrial activities. Another 18% came from methane, with the energy sector accounting for approximately 40% of total emissions of this gas (second only to agriculture) (IEA, 2022c). Apart from contributing to the rise in global temperatures, the burning of fossil fuels generates other externalities, such as ocean acidification and the emission of particulate matter, which is extremely harmful to human health (Bertrand, 2021). It is therefore urgent to rethink and redesign the predominant use of these energy sources in the global energy matrix.

In addition, the commitments made by individual countries under the 2015 Paris Agreement necessitate the transformation of the global energy matrix. To achieve this, total investment in energies needs to be increased, retargeting existing capital towards clean and renewable energy sources, and increasing the direct financing of these technologies. Investment in the sector is expected to grow from 2.5% of GDP today to 4.5% in 2030, mainly in power generation and the associated infrastructures. This investment is likely to come mainly from private sources, influenced, naturally, by public policy and government incentives (IEA, 2021b).

According to projections by BloombergNEF (2022) and IEA (2021b), the coming decades will see a reorganization of the energy market. While total energy consumption is expected to increase, including to meet the demand of the 700 million people who do not have access to modern energy sources, there will be a drastic reduction in the use of fossil fuels (United Nations, 2021). To achieve

² GHG emissions can be either anthropogenic, that is caused by human activities, or non-anthropogenic (in other words, natural). The latter are produced by plant respiration and decomposition, the release of GHGs by the oceans, forest fires, swamps, and other sources. They are challenging to measure, because of their variability and the size of the emitting sources; there is also no consensus on their magnitude (ICOS n.d.; Yue and Gao 2018). Efforts to mitigate the effects of climate change focus on anthropogenic emissions, in other words those caused mainly by the burning of fossil fuels, deforestation, agriculture, and industrial activities, which have unequivocally caused global warming (ICOS n.d.; IPCC 2023).

net zero GHG emissions by 2050 (see box II.1), major changes are needed in the global energy matrix, especially in the manufacturing sector, where electricity consumption is set to rise from 20% in 2022 to 35% in 2050 under the net zero scenario. In the same year, coal and natural gas consumption will account for just 5% and 8% of the mix, respectively (BloombergNEF, 2022). This would represent a total investment opportunity of US\$ 194 trillion by 2050, in both demand and supply-side projects. Of this total, an estimated 47% would be channelled to the electric vehicle industry and 24% to low-carbon power generation. Considering investments in energy supply alone, for every dollar spent on fossil fuel production in 2030, US\$ 2.9 would be invested in clean energy sources, rising to US\$ 4.9 in the 2030s and US\$ 9.7 in the 2040s (BloombergNEF 2022).

Box II.1

The role of the energy sector in the net zero CO₂ emission targets

Climate change is already having tangible effects on people, economies and ecosystems around the world, owing especially to the increased prevalence of extreme weather events. The decade between 2011 and 2022 is considered the warmest on record; and the greater intensity and frequency of such phenomena, including more severe storms, increased droughts, species loss and food shortages, are direct consequences of climate change (United Nations, n.d.).

To mitigate these effects, 196 countries signed the Paris Agreement in 2015 (which entered into force in 2016) to limit global warming to well below 2°C, with ambitions of 1.5°C, compared to pre-industrial levels (UNFCCC, n.d.). The chances of restricting global warming to 1.5°C are greater if the net zero CO₂ emissions target is achieved by 2040 (IPCC, 2022).

According to the IPCC (2022) definition, net-zero CO₂ emissions are the level at which all anthropogenic CO₂ emissions are globally balanced by anthropogenic CO₂ removal over a given period. To attain this level, the first step is to adopt emission mitigation measures, which consist of reducing GHGs released into the atmosphere. The energy sector has a key role to play in this regard, since 75.6% of current emissions are associated with this sector. The remaining GHG emissions would be offset by actions to remove carbon from the atmosphere, which can occur through reforestation or the development and diffusion of carbon capture and storage technologies, among other measures (Ge, Friedrich and Vigna, 2020; Levin and others, 2023).

In the case of CO₂ emissions related to energy combustion and industrial processes, according to the IEA net zero CO₂ emissions scenario (IEA, 2022), CO₂ emissions would have to be reduced from the current 36.8 Gt to 23 Gt in 2030 and to zero in 2050, with an additional 75% reduction in energy-related methane emissions in 2030. These scenarios pose a major challenge, given the levels of ambition implied in current policies.

The first step to achieving zero net CO₂ emissions by mid-century requires eliminating all use of fossil fuels from the global energy matrix, and shifting to energy sources that are considered clean, such as wind, solar, other renewable energy sources and nuclear energy (BloombergNEF, 2022). In addition, the widespread adoption of energy efficiency measures is considered essential, first and foremost in terms of the use of new construction and insulation materials. This will need to be matched by the use of new technologies and more efficient installations, and a change in society's behaviour involving the adoption of new production and consumption habits. Another necessary measure is the electrification of machinery and equipment that previously operated with combustion engines, powered by natural gas or other fossil or less efficient fuels, both from the industrial point of view and at the individual level. Examples include new domestic electric heaters and electric stoves to replace those that burn gas or biomass. Moreover, in the transport sector, greater use will need to be made of electric vehicles and, in manufacturing, the efficient use of raw materials for which production is energy-intensive, such as cement and steel (IEA, 2022).

In this context, the demand for fossil fuels by 2050 is likely to be met by current assets and projects already approved, without the need for new investments or new oil exploration and exploitation projects (IEA 2022). Moreover, enterprises in the oil and gas exploration and production sector must not only invest in more efficient processes to reduce their operational emissions; they must also reduce their own production and sale of fossil

fuels, and increase their investments in low-carbon energy sources and technologies to remove carbon from the atmosphere (International Investors Group on Climate Change, 2021). However, the large producers do not display clear, ambitious and transparent targets and strategies for transitioning their business model to the sector's requirements. According to the World Benchmarking Alliance (WBA, 2021), of the 100 key firms in the sector that are evaluated in its benchmarking exercise, only 13 have low-carbon transition plans that extend at least 20 years into the future. Four of these are the oil giants Eni, Equinor, Shell and TotalEnergies.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, "Causes and effects of climate change", n.d. [online] <https://www.un.org/en/climatechange/science/causes-effects-climate-change>; United Nations Framework Convention on Climate Change (UNFCCC), "The Paris Agreement: What is the Paris Agreement?", n.d. [online] <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>; Intergovernmental Panel on Climate Change (IPCC), "Global Warming of 1.5°C", *An IPCC Special Report on Impacts of Global Warming of 1.5°C above Pre-Industrial Levels in Context of Strengthening Response to Climate Change, Sustainable Development, and Efforts to Eradicate Poverty*, Cambridge University Press, 2022; M. Ge, J. Friedrich and L. Vigna, "4 charts explain greenhouse gas emissions by countries and sectors", World Resources Institute (WRI), 6 February 2020 [online <https://www.wri.org/insights/4-charts-explain-greenhouse-gas-emissions-countries-and-sectors>]; K. Levin and others, "What does 'net-zero emissions' mean? 8 common questions, answered", WRI, 20 March 2023 [online] <https://www.wri.org/insights/net-zero-ghg-emissions-questions-answered>; International Energy Agency (IEA), *World Energy Outlook 2022*, Paris, 2022; BloombergNEF, "New Energy Outlook 2022. Executive summary", 2022 [online] <https://bnef.turtl.co/story/neo-2022/page/3?teaser=yes>; Institutional Investors Group on Climate Change (IIGCC), *Net Zero Standard for Oil and Gas Companies*, 2021; and World Benchmarking Alliance (WBA), *Climate and Energy Benchmark in Oil and Gas: Insights Report*, 2021.

Despite the emphasis on investments in renewables, to achieve a safe and orderly energy transition it is necessary to plan the demand for and supply of non-renewable energy in the short, medium and long terms (IEA, 2022d). In a scenario in which electricity generated from renewable sources predominates, large-scale investments will be needed in transmission and distribution infrastructure, such as underground and submarine transmission cables, high voltage direct current (HVDC) lines, and others. These investments require both large-scale resources and also time to become viable (BloombergNEF, 2022). However, since 2015, the level of investment in clean energy has been below that needed to transform the global energy system (IEA, 2022d).

Another challenge is the fact that the supply of some renewable energy sources, such as solar and wind, is highly variable; and this variability will likely be intensified by changes in weather patterns. Nonetheless, it can be mitigated by improvements in stationary energy storage technologies (IEA, 2022d), supported by non-intermittent generation and interconnectivity between different regions. On this point, stationary storage sources (batteries) are already facing production bottlenecks, because they rely on metals such as lithium, cobalt and nickel, some of which are relatively scarce in nature. According to BloombergNEF (2022), the energy transition will demand 17.5 times more lithium in 2050 than was consumed in 2020. Jiménez and Sáez (2022) suggest that the demand for lithium already exceeded supply in 2021; and, although new exploration projects for the metal, in conjunction with recycling technologies, offer solutions for overcoming this bottleneck, the short-term scenario is uncertain. According to ECLAC estimations, the expansion of electricity capacity in Latin America and the Caribbean over the next 10 years, with an emphasis on renewable energies and regional integration, is projected to require 611,000 tons of copper, 53,300 tons of nickel, 2,500 tons of cobalt and 2,100 tons of lithium (ECLAC, 2023a).

All of these factors suggest that non-renewable energies will remain important in the coming decades. This will contribute not only to the avoidance of major imbalances between energy supply and demand, the consequences of which were seen in 2022 owing to interruptions in the supply of natural gas in the context of the conflict between the Russian Federation and Ukraine, but also to ensuring sufficient flexibility to adapt to global shocks and the way investments are allocated, thereby contributing to energy security (IEA, 2022d).

However, for non-renewable sources to guarantee energy security in the period in which the transition is made, the sector needs investment. Even if, in the net zero GHG emissions scenarios, investments in the non-renewable energies sector are limited to current assets and already approved projects, that is without prospecting or exploring for new oil, coal or natural gas reserves, the International Energy Agency states that the lack of resources allocated to the non-renewable energies sector, coupled with investments in renewables that are insufficient to meet energy demand in the medium and long terms, would limit energy supply and pose risks to the global energy market balance in the short term (IEA, 2022d).

In this context, Latin American and Caribbean countries face a number of opportunities and challenges. The recent discoveries of sedimentary basins and unconventional hydrocarbon reserves have the potential to attract FDI and generate employment and income, which are crucial for achieving the Sustainable Development Goals (SDGs). Moreover, the sophistication and diversification of the productive apparatus will be enhanced if policies are implemented to promote them. There are also possibilities for attracting investments in industries related to the other stages of the oil and natural gas value chain. These relate, primarily, to the infrastructure needed for the exploration and commercial exploitation of these hydrocarbons—including the construction and operation of oil and gas pipelines, refineries, storage, processing and export terminals, and associated industries, among other items. On the other hand, given the properties of natural gas as a versatile and less polluting hydrocarbon, its privileged use as a non-renewable energy source in the context of the energy transition makes investing in reserves in Argentina (Vaca Muerta) and in Brazil's deep waters, an attractive proposition (Arroyo, 2019).

This optimism should be treated with caution, however. If the climate commitments made internationally are actually fulfilled, a lower global demand for oil in the coming years could make its price even more volatile, with a strong downward trend. This would be especially worrisome for the region, since oil and natural gas extraction in unconventional reserves is more expensive and, therefore, could become financially unviable. As a result, investments in exploration and exploitation activities could decrease, and some already discovered reserves could become stranded assets, which would make pre-existing investments extremely unprofitable. This would lead to a decrease in activity in the hydrocarbons sector and, consequently, to a reduction in revenues obtained from the extraction, production, and commercial exploitation of hydrocarbons (Arroyo, 2019).

Accordingly, it is very important to examine investment trends in the oil, coal and natural gas sector, with a special focus on Latin America and the Caribbean. This would afford an understanding of the region's position and provide insights into how policy makers can leverage these investments to promote economic and social development, without losing sight of the context of the energy transition.

B. Geographically concentrated reserves and a market dominated by large corporations

1. Some countries in the region have large reserves but face challenges in exploiting them

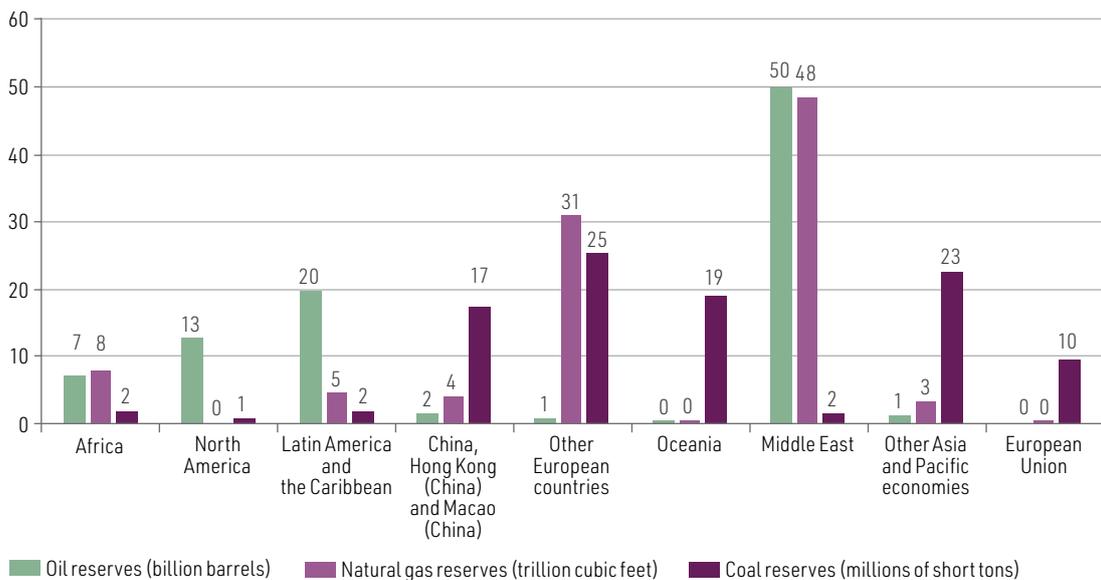
Although final energy use is essentially local, whether stationary (in households, industry, commerce) or mobile (transportation) within the borders of a country or region, the international energy trade is an important component of global exchanges. Given their high energy density and versatility,

non-renewable energy sources (oil, coal and natural gas) are international commodities which are highly profitable to explore, extract, produce and sell. In 2021, exports of these commodities totalled US\$ 2.4 trillion at current prices, representing 11.1% of total global exports. Oil alone, in all its forms, accounted for 9.3% (United Nations, 2022).

The reserves of these hydrocarbon resources are highly concentrated geographically. In 2021, half of the world's proven oil and natural gas reserves were located in the Middle East, while global coal reserves were relatively less concentrated, with 40% of the total found in Asia and 35% in European countries (see figure II.5). Latin America and the Caribbean is the region with the second largest reserves of oil (20%) and has the fourth largest natural gas reserves (5%).

Figure II.5

Global fossil fuel reserves by region, 2021
(Percentages of the world total)



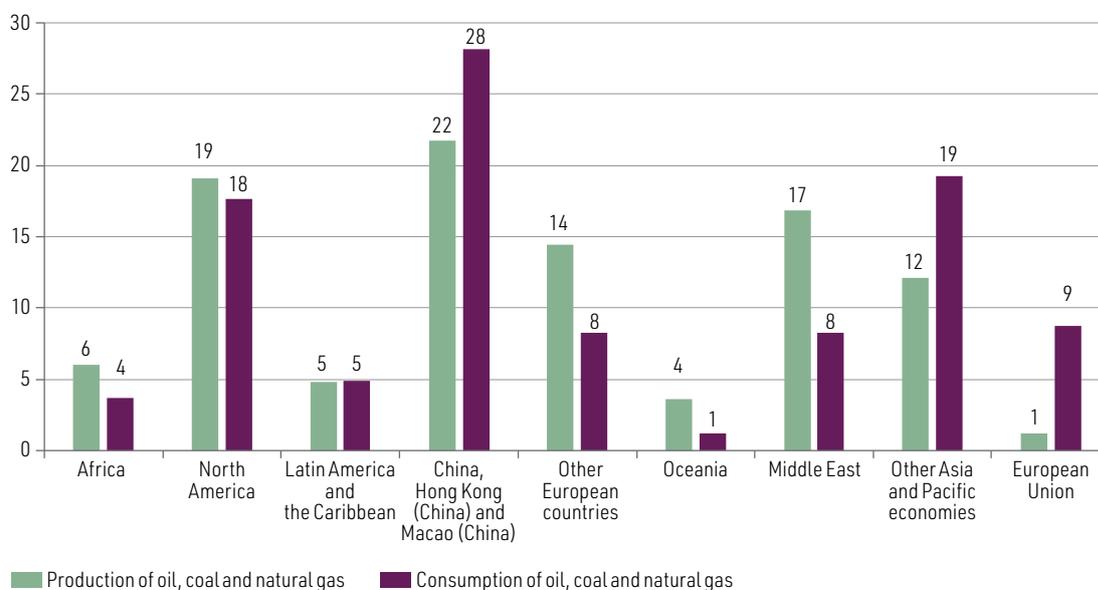
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from the United States Energy Information Administration (EIA).

In terms of geographic distribution, the production and consumption of fossil fuels does not coincide with the location of the main reserves. China, Hong Kong (China) and Macao (China) lead the world's production and consumption, mainly owing to coal production in China. These territories accounted for more than one fifth of fossil fuel production and almost one third of world consumption in 2021 (see figure II.6). The United States is the world's largest oil producer (20% of the global total in 2021), followed by Saudi Arabia (11%) (EIA, 2022b). Latin America and the Caribbean's share in both production and consumption is 5% —similar to its share of global reserves in natural gas, but substantially lower in the case of oil production.

Production and consumption data show that Latin America and the Caribbean is a relatively self-sufficient region. It is a net exporter of fossil energy sources overall, but not in the case of natural gas: in 2021, it consumed 2.4 quads more than it produced (see table II.2). In fact, demand for this fuel has been outpacing production since 2003, mainly owing to its use as an input for electric power generation, especially in the manufacturing sector (OLADE, 2015).

Figure II.6

Fossil energy production and consumption, 2021
(Percentages of total quads)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from the United States Energy Information Administration (EIA).

Note: A quad is a unit of energy equal to 1 quadrillion (10^{15}) British thermal units (BTUs).

Table II.2

Latin America and the Caribbean: total energy production and consumption by source, 2021
(Quads)

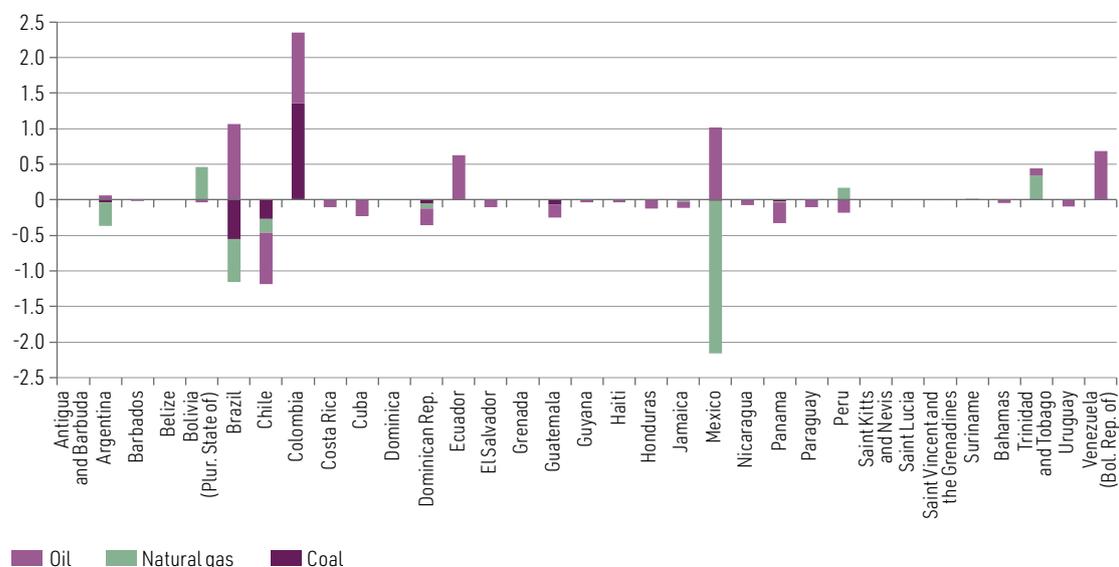
	Total energy production	Total energy consumption
Oil and other liquids	16.4	14.5
Nuclear and renewables	8.7	8.8
Natural gas	6.3	8.7
Coal	1.8	1.4
Total energies	33.1	33.4

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from the United States Energy Information Administration (EIA).

This situation of apparent equilibrium in the region as a whole does not extend to all producing countries. Only six were net exporters of oil, coal and natural gas in 2021: the Bolivarian Republic of Venezuela, Colombia, Ecuador, the Plurinational State of Bolivia, Trinidad and Tobago and Suriname. The remainder, including some of the region's major hydrocarbon producers, such as Argentina, Brazil and Mexico, consumed more than they produced (see figure II.7). The region is highly heterogeneous, and even the availability of resources, sector regulations, the domestic consumption market and business actors vary greatly between producing countries. This forms a diverse panorama, but a number of common challenges can be described.

Figure II.7

Latin America and the Caribbean: net production of oil, coal and natural gas, 2021
(Quads)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from the United States Energy Information Administration (EIA).

Despite the region's key position in terms of world oil reserves and the overall balance between production and consumption, it faces major challenges as a hydrocarbon producer. These include the declining productivity of its conventional reserves, which raises the need for continuous investment to maintain competitive and efficient production, even in more mature wells. There is also the problem of guaranteeing the viability of extracting oil and natural gas from unconventional reserves in a context of volatile hydrocarbon prices (see box II.2). Thus, to achieve a productive and internationally competitive sector, it is essential to attract investments that enable innovative exploration and production technologies to be developed and logistical improvements to be made (Bulgheroni, 2017).

Lastly, as will be discussed in section D, foreign direct investment in the sector is not always directed to where the world's largest reserves are located.

2. A lucrative industry in which large state-owned corporations coexist with transnationals

(a) The hydrocarbon industry value chain

The oil and natural gas value chain consists of three well-defined stages, which are described below. Despite some similarities, each of the sources has specific features.³ Nonetheless, a firm in the sector may integrate its actions in more than one stage of the value chain, as explained below (Tordo, Tracy and Arfaa, 2011).

³ Crude oil and natural gas are often extracted concomitantly, giving rise to the notion of "associated gas" (McLean, Charles and Rajkumar 2021).

Activities of prospecting, exploration (both on and offshore, and both conventional and unconventional),⁴ production and decommissioning (upstream) form the first stage. This is the stage of highest risk in the industry's value chain and, consequently, the stage of highest potential return (Álvarez and others, 2018; IRBC, 2019).

The second stage consists of crude oil and natural gas transportation and storage activities (midstream). The transportation of crude oil comprises all the infrastructure necessary to move it from the point of production to the refineries. It requires crude oil storage terminals, pipelines and oil tankers, among other items. The transportation of natural gas requires an infrastructure network consisting of pipelines and terminals. Given its physical properties, natural gas has to be transported and stored under high pressure, which requires specific and more expensive infrastructures. Liquefaction, one of the first stages in its processing, makes it easier and safer to transport, thereby expanding the markets for this energy source. Natural gas can also be transported in tanker trucks. Although this modality is more expensive and less flexible in terms of demand and supply, it enables the fuel to reach more distant markets (Álvarez and others, 2018; McLean, Charles, and Rajkumar, 2021).

Activities in the third stage comprise the refining or processing of crude oil and natural gas, together with its distribution, sale, and final use (downstream). The refining process, which is not necessarily done in the producing country, adds value by transforming crude oil into petroleum products such as gasoline, diesel or liquefied petroleum gas (LPG) for final consumption (Álvarez and others, 2018). Although refining activities provide an economically attractive opportunity for non-producing countries to enter the hydrocarbons value chain, the activity is only economically viable if operating costs are low, as it depends on the difference between crude oil prices and the average price of refinery products, known as the “crack spread” (McLean, Charles, and Rajkumar, 2021).

The refined products reach their end-consumers through various channels, including distribution to gas stations, supply to aircraft and ships, and inputs for industry (Álvarez and others 2018).

Both oil and its derivatives and natural gas can be transformed into a wide range of products in the petrochemical industry. These include synthetic fibres, tyres, plastics, packaging, fertilizers, digital devices and many articles, the manufacture of which generated 12% of global oil demand in 2018 (IEA, 2018). Despite its crucial importance, the study of the petrochemical sector is beyond the scope of this analysis.

(b) The leading firms in the hydrocarbon market

Broadly speaking, the firms in the sector can be divided into national (state-owned) oil companies and international oil companies. Examples of large state-owned firms include Saudi Aramco of Saudi Arabia, Rosneft of the Russian Federation and the China National Petroleum Corporation (CNPC). The second category includes the western giants TotalEnergies (France), BP (United Kingdom), Shell (United Kingdom/Kingdom of the Netherlands), Chevron and Exxon Mobil (both United States), also known as “big oil” (Guttman, 2020).

Some national oil companies operate only in the upstream stage of the domestic market, such as the National Iranian Oil Company (NIOC) of the Islamic Republic of Iran; others are firms with highly vertical and international operations (“quasi-international firms”), as exemplified by Petronas of Malaysia. Their evolution and expansion will depend above all on government strategy, related, for example, to the need to diversify the country's energy supply and to support the political and strategic decisions of the respective host country government (Guttman, 2020; Ledesma 2009).

⁴ Unconventional hydrocarbons include heavy oils, tar sands, and bituminous shale (see box II.2).

National or state-owned oil companies control an estimated 85% of the world's hydrocarbon reserves, which affords them a comfortable monopolistic position. In contrast, international oil companies are forced to expand their access to international reserves by participating actively in exploration, and in research and development, especially with regard to new technologies (Guttman, 2020; *Electricidad* 2010).

International oil companies tend to operate in a more efficient and short-term results-oriented manner, which often facilitates their access to financial resources (Guttman, 2020; Ledesma, 2009) but it also leaves them more vulnerable to transactional risks, and especially reputational risks, and those related to changes in legislation and financing regulations owing to issues such as climate change. There are other factors that influence the structure and integration strategies of firms participating in the hydrocarbon value chain. In particular, horizontal integration is sought mainly to achieve economies of scale, which are crucial in an industry in which investments are highly capital-intensive. The main objectives include not only reducing operating costs and sharing infrastructure, but also accessing new markets and reducing the risk associated with investments concentrated in a single country, especially in a sector that is highly susceptible to geopolitical conflicts (Tordo, Tracy and Arfaa, 2011).

In contrast, vertical integration focuses first and foremost on optimizing logistical operations: for example, in the case of oil, the aim is to integrate the extraction, production, storage and refining stages; or, in the case of natural gas, the aim is to integrate extraction, storage, liquefaction and transportation. This makes it possible to mitigate the risks associated with either the geological specifics of the product⁵ or the ease with which it can be exported, or both (Tordo, Tracy and Arfaa, 2011).

The vertical and horizontal integration decisions of firms in the hydrocarbon market are also influenced by the international price of these raw materials. When prices are falling, firms in the sector tend to consolidate their operations in the same geographic region, taking advantage of economies of scale and lower operating costs. In periods of rising prices, firms attempt to enter new markets, either geographically or in relation to the product (for example: the acquisition of firms operating in the exploration and production of unconventional resources by firms specialized in conventional exploration, as occurred in the United States in the decade of 2000) (Evans, Nyquist, and Yanosek, 2016).

Whatever their shareholding arrangement or scope of operation, both national and international oil companies have come under intense international public scrutiny. At the World Economic Forum in Davos in January 2023, United Nations Secretary General Antonio Guterres declared that the business model of fossil fuel firms is “inconsistent with human survival” (United Nations, 2023). Despite this, the major western firms in the sector (BP, Chevron, ExxonMobil, Shell and Total Energies) earned income of US\$ 200 billion in 2022. The Arab firm Saudi Aramco alone reported net income of US\$ 130.23 billion in the first nine months of 2022 (Saudi Aramco, 2022; Bousso and Valle, 2023; *The New York Times*, 2022).

These are all large firms; and, in fact, 22 of the world's 100 largest firms (by revenue) in 2022 were in the energy sector (Fortune, 2022), with 64% of them operating vertically in the oil and natural gas sector (see table II.3). Of these 22, nine were of European origin (41%), seven were Chinese state-owned (32%), and five (23%) were from the United States.

⁵ An example is the oil extracted from Kuwait, which is considered very heavy and difficult to refine. The fluctuation of its market demand has led this Arab country to invest in the storage and refining stages to boost its product's participation in the international market (Tordo, Tracy and Arfaa, 2011).

Table II.3

Largest firms in the non-renewable energies sector worldwide by income, 2021

Fortune 500	Firm	Parent firm country	Sector of operation	Income (Millions of dollars)	Number of employees (worldwide)
3	State Grid Corporation of China	China	Electricity supply	460 685	871 145
4	China National Petroleum Corporation (CNPC)	China	Oil and gas ^a	435 279	398 440
5	Sinopec Group	China	Oil and gas ^a	384 800	385 691
6	Saudi Aramco	Saudi Arabia	Oil and gas ^a	359 095	70 496
12	ExxonMobil	United States	Oil and gas ^a	276 692	62 000
15	Shell	United Kingdom	Oil and gas ^a , Renewables	261 504	87 000
23	Glencore	Switzerland	Coal, oil and gas ^a	203 751	81 706
27	TotalEnergies	France	Oil and gas ^a	184 634	101 279
35	BP	United Kingdom	Oil and gas ^a , hydrogen	157 739	67 600
37	Chevron	United States	Oil and gas	155 606	43 846
49	Marathon Petroleum Corporation (MPC)	United States	Oil and gas ^a	119 983	17 800
52	Gazprom	Russian Federation	Oil and gas ^a	138 979	477 600
56	Fortum	Finland	Electricity supply	132 943	7 712
65	China National Offshore Oil Corporation (CNOOC)	China	Oil and gas ^a	126 938	80 957
67	LUKOIL	Russian Federation	Oil and gas ^a	128 038	"+" 100 000
69	Shandong Energy Group	China	Coal	113	179 689
74	Phillips 66	United States	Oil and gas ^b	111 476	14 000
82	Valero Energy	United States	Oil and gas ^b	113 977	9 743
85	China Energy Investment (CHN Energy)	China	Coal	100 408	350 000
89	China Southern Power Grid (CSG)	China	Electricity supply	104 118	282 006
90	Enel	Italy	Electricity supply	99 475	65 124
95	Électricité de France (EDF)	France	Electricity supply	99 897	197 390

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Fortune, Global 500[®], 2022 [online] <https://fortune.com/ranking/global500/>; Bloomberg; Financial Times, fDi Markets, and reports from the respective companies.

Notes: The electricity suppliers included are those that use some type of non-renewable energy in their generation. The firms in the shaded rows are national oil companies.

^a Prospecting, exploration, production and decommissioning activities (upstream); crude oil and natural gas transportation and storage activities (midstream); and crude oil and natural gas refining or processing, distribution, sale and end-use activities (downstream).

^b Midstream and downstream activities.

In Latin America and the Caribbean, firms in the hydrocarbons sector represent a much smaller share of the largest firms than is the case globally: of the 100 largest firms in the region by total sales revenue, 11 were in the oil and natural gas sector in 2020 (table II.4).

Table II.4

Latin America and the Caribbean: largest firms in the non-renewable energies sector by income, 2020

Fortune 500 rank	Firm	Parent firm country	Sector of operation	Income (Billions of dollars)	Employees (worldwide)
1	Petrobras	Brazil	Oil and natural gas ^a	53.282	370 955
4	Petróleos Mexicanos (PEMEX)	Mexico	Oil and gas ^a	44.676	134 500
13	Servgás Distribuidora de Gás	Brazil	Natural gas ^a	19.492	176 686
15	Petrobras Distribuidora (Vibra Energia)	Brazil	Oil and natural gas ^a	15.961	101 465
16	Ultrapar	Brazil	Natural gas ^a	15.931	105 794
22	Ecopetrol	Colombia	Oil and natural gas ^a	13.590	10 920 ^c
25	Copec	Chile	Oil and natural gas ^a	13.129	38 000
28	Ipiranga Produtos de Petróleo	Brazil	Oil and natural gas ^b	12.619	3 355
40	YPF	Argentina	Oil and natural gas ^a	9.581	22 932 ^d
77	EP Petroecuador	Ecuador	Oil and natural gas ^a	6.146	3 712
100	Primax	Peru	Oil and natural gas ^b	4.986	6 019

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of *América Economía*, “Conozca las 500 Mayores Empresas de América Latina 2021”, 2022 [online] <http://www.americaeconomia.com/negocios-industrias/multilatinas/conozca-las-500-mayores-empresas-de-america-latina-2021> and data from Bloomberg; Financial Times, fDi Markets, and reports from the respective companies.

Notes: The firms in the shaded rows are national oil companies.

^a Prospecting, exploration, production and decommissioning activities (upstream); crude oil and natural gas transportation and storage activities (midstream); and crude oil and natural gas refining or processing, distribution, sale and end-use activities (downstream).

^b Downstream activities.

^c 2016 data.

^d 2020 data.

Six of these firms (55% of the total) operate vertically throughout the value chain of the oil and natural gas industry. All of these are national oil companies or firms of mixed ownership, except for Copec of Chile.⁶ Vertical integration proves advantageous for firms operating in markets that are particularly vulnerable to variations in the price of oil, such as Latin America and the Caribbean. This strategy ensures market share in crude oil production in periods when prices are unfavourable; and it secures the supply of crude oil to refineries at times when prices are more competitive (Al-Moneef, 1998). In general, the region displays the coexistence of different degrees of openness to international capital in the hydrocarbon market, reflecting not only historical but also political conditions and the availability of reserves of the resources in question. In this context, the weight of state-owned firms operating in the hydrocarbons sector will vary, both in terms of market concentration and in their role as key promoters of exploration and exploitation activities, and also as market regulators.

It is also important to note that, of the 11 firms highlighted, five are Brazilian (45% of the total). This reflects the size of the hydrocarbon market in Brazil, which is currently the largest oil producer in the region. Although the Brazilian market was liberalized in the second half of the 1990s, the state-owned Petrobras still accounts for 70% of production and remains the leading operator of conventional and unconventional hydrocarbon exploration fields (Campodónico, 2004; Carpenter, 2023; Serrani, 2013).

The second largest firm in the region’s hydrocarbons sector, Petróleos Mexicanos (PEMEX), was created in 1938 and was responsible not only for defining Mexican policy in the sector, but also for managing the foreign assets that were expropriated in that year. Since then, the company has held

⁶ Copec conducts its oil exploration, extraction and production operations through Compañía Latinoamericana Petrolera S.A. (CLAPSA), a subsidiary that operates mainly in Ecuador and Colombia—in which Copec owns 60% of the share capital (Copec 2007).

a monopoly on the exploration and production of oil and natural gas in Mexico. Despite repeated assertions of the strategic nature of the hydrocarbons sector for the country's development, in 1995 an amendment was made to the Regulatory Law of Article 27 of the Constitution in the Oil Sector. This made natural gas markets in the country more flexible to meet a growing domestic demand for the resource, particularly in the industrial sector (Zenteno Barrios, 1997; Sánchez, 1998). In 2013, Mexico introduced a constitutional reform that liberalized the energy sector, encouraging private investment and admitting foreign capital in all phases of the oil and gas value chain. Shortly after the change, FDI project announcements in the sector surged from an average of US\$ 499 million between 2009 and 2013 to US\$ 3.128 billion between 2014 and 2018. The pace of announcements slowed in 2019, 2020 and 2021, as the government attempted to reverse the liberalization of the sector. However, they revived in 2022, in particular with two project announcements totalling US\$ 5.9 billion. Both of these related to offshore oil exploration by firms that had already entered Mexico in the years following the opening up of the market (Stillman, 2022; Jaramillo, 2021). Nonetheless, recent years have witnessed a decline in production from both the state-owned PEMEX and private firms in the region, despite expectations of increased production from recent discoveries of offshore deposits (Solís, 2022; Carpenter, 2023).

In Argentina, YPF was founded in 1922 as the continent's first state-owned hydrocarbon enterprise, since when it has been operating on a vertically integrated basis. Although it functioned as a public oligopoly, it was not until 1967 that the Hydrocarbons Law (No. 17.319) declared the oilfields to be State patrimony and established a royalty of 12% to be paid by the private firms that participated in their exploitation. Thereafter, the market has been gradually opened up through liberalizing reforms, culminating in 1999 with the purchase of YPF by the Spanish firm Repsol for approximately US\$ 15 billion (Casey, Shotts, and Melvin, 2017; Serrani, 2013). However, the following decade was characterized by financial and monetary instability in Argentina, which impacted the liberalization of the sector and culminated in 2012 with the renationalization of 51% of the firm through expropriation (Serrani, 2013). Since then, YPF has operated as a mixed-ownership enterprise (Ministry of Public Works, n.d.). It is important to note that there are high expectations in the Argentine sector following the discoveries of unconventional hydrocarbons in Vaca Muerta (Carpenter, 2023).

In Colombia, Empresa Colombiana de Petróleos (Ecopetrol) was founded in 1951 with the return of the "Concesión de Mares" concession to the Colombian State. On that occasion, the concession contract held by Tropical Oil Company, of the United States, which had pioneered oil production in Colombia since 1921, reverted to the State. In addition to incorporating the operations of other reverted concessions⁷ and new oil discoveries in the country, Ecopetrol was tasked with managing and regulating Colombia's hydrocarbon resources until 2003, when Decree 1760 of June 26 organized it as a joint stock company, mitigating possible conflicts of interest (Espinasa, Medina and Tarre, 2016; Ecopetrol, 2014). In 2007 Ecopetrol made its initial public offering of shares on the Colombian Stock Exchange; and in 2008 it did the same in New York, mainly to raise funds to implement its investment plan of that year (Espinasa, Medina and Tarre, 2016; Londoño, 2008). Today, attached to the Ministry of Mines and Energy, which holds 88.49% of its shares, Ecopetrol is Colombia's largest firm (Ecopetrol, 2021). Despite Ecopetrol's recent discoveries of unconventional reserves, especially natural gas, the firm has committed publicly to a goal of zero net emissions by 2050, indicating that it will invest to diversify its portfolio into low-emission businesses, both within the hydrocarbon value chain and elsewhere. These include investments in transmission and electricity generation from renewables, as well as plans to invest in technologies such as carbon

⁷ In 1969, the Colombian Congress adopted Law 20, which replaced the concessions regime with association contracts. At that time, the royalties for hydrocarbon exploration activities were increased from 11.5% to 20%, and the remainder began to be shared equally between the beneficiary and Ecopetrol (Espinasa, Medina, and Tarre, 2016).

dioxide capture, utilization, and storage and those of hydrogen (DW, 2022; Martínez Ortiz and Delgado, 2021).

Other state-owned oil companies in the region include Empresa Pública de Hidrocarburos del Ecuador (Petroecuador) in Ecuador, and both Petroperú S.A. and Perupetro S.A. in Peru. Created in 1989 to invigorate hydrocarbon management in the country, Petroecuador began its activities by operating in all phases of the hydrocarbon value chain. The firm assumed the responsibilities of the consortium formed by Corporación Estatal Petrolera Ecuatoriana (CEPE) and Texaco of the United States, established during the nationalization process in the early 1970s. It also took over the management of refineries and pipeline systems. In 2010, Petroecuador underwent a reorganization in which it ceased to operate as a holding company and was consolidated as a public enterprise. Today, Petroecuador is one of the largest firms in Ecuador and is dedicated to the exploration, production, transportation and commercial exploitation of oil and natural gas (EP Petroecuador, 2013). It is also worth noting the different amendments of the hydrocarbon laws in Ecuador with the aim of increasing the share of windfall profits obtained from the rise in the price of oil. In 2006, it was established that 50% of these profits should be delivered to the treasury by the firms operating in the sector. In 2007 the share was raised to 99%, still leaving open the possibility of renegotiation of contracts, which changed the operating conditions for transnational companies in the country (EP Petroecuador, 2013).

In Peru, the sector has two state-owned companies under private law: Petroperú S.A. and Perúpetro S.A. Founded in 1969 as part of the nationalization of hydrocarbons in the country, Petroperú S.A. operates in the transportation, refining, distribution and marketing of fuels and other petroleum derivatives in the country. In other words, its operations are mainly in the midstream and downstream stages of the hydrocarbon value chain (Petroperú, 2023). Perúpetro S.A. was created in 1993 as part of the reformulation of the country's energy and mining sector. Its objective is to represent the Peruvian State in the promotion, negotiation and supervision of contracts for the exploration and exploitation of hydrocarbons in the country (Perúpetro, n.d.).

C. An industry that generates large foreign capital flows

1. North America and Europe lead investments worldwide

Investments in fossil energy are capital-intensive and take a long time to reach maturity; and they are generally sensitive to the prospects for international fossil fuel prices. Thus, the fall in fossil fuel prices that occurred in 2014 and 2015 reduced long-term investments in the sector, especially in the upstream segment: from US\$ 890 billion in 2014, investments fell by 45% between 2014 and 2016 and by a further 30% between 2019 and 2020, to reach a level of US\$ 353 billion. The drop in total energy consumption resulting from the coronavirus disease (COVID-19) pandemic caused oil and natural gas prices to fall sharply, reaching an average level of US\$ 44 per barrel of crude oil in 2020 (IEA, 2022b and 2022d).

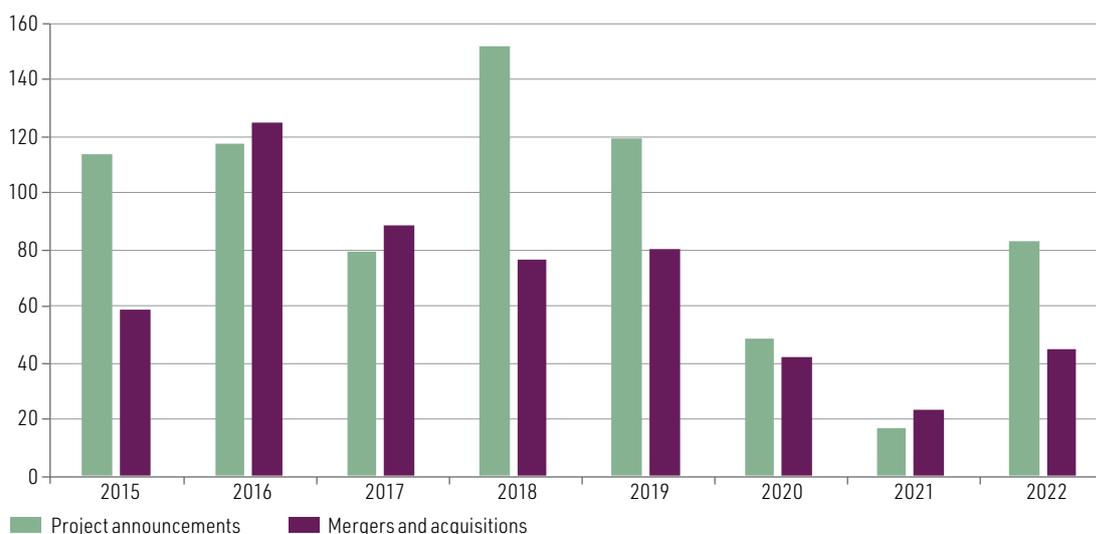
In the early months of 2022, a rapid recovery of demand combined with the conflict in Ukraine pushed prices higher; and in 2022 the price of a barrel of crude oil climbed back to US\$ 105. This boosted a number of trends that were already visible in the global energy markets, especially in relation to increased trade in minerals that are critical for battery production; and it hastened the development of hydrogen as an energy source. It also highlighted the strategic needs of countries to reduce their reliance on imported fossil energy sources— associated with commitments to mitigate the effects of climate change (IEA, 2022b and 2022d).

In this context, there has been a tentative resumption of FDI flows in the sector, especially in response to the discovery of non-conventional energy sources and the dissemination and lower cost of the technologies needed to make their exploitation and commercialization viable.

An initial characteristic of cross-border investments in this sector is that, in terms of amount, new project announcements have generally outweighed purchases of existing assets in recent years. Although the figures are not directly comparable owing to their nature (the former are investment intentions, while mergers and acquisitions refer to completed transactions), project announcements have been the main vehicle through which firms in the non-renewable energies sector have internationalized their businesses. They have proven highly volatile, however (see figure II.8).

Figure II.8

Global cross-border mergers and acquisitions and project announcements in the oil, coal and natural gas sector, 2015–2022
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets, and Bloomberg.

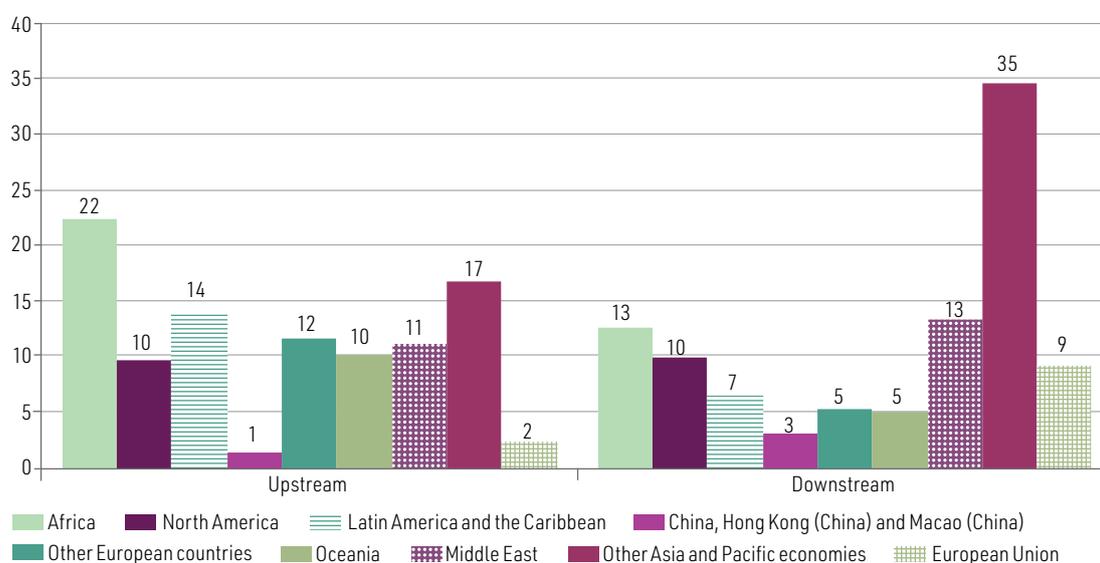
The larger size of project announcements reflects not only the scale of investments associated with the discovery of new oil and natural gas reserves, including the infrastructure needed for their production and commercial exploitation, but also the fact that large cross-border mergers and acquisitions took place in periods preceding this study's the analysis horizon. Moreover, a recent trend in the sector consists of M&A in domestic markets, especially in the United States, which are not covered by this study.

Another peculiarity is that the geographic concentration of oil, gas and coal reserves, and also of their consumption and production, have not necessarily been the factors determining where the largest greenfield project announcements were made. In fact, the largest volumes of investments announced in the upstream phase of the oil, natural gas and coal value chain between 2005 and 2022 targeted Africa (22%) and the other Asia-Pacific economies (17%). This mainly reflected the impact of two large projects, one in Angola and the other in Kazakhstan (see figure II.9). The Middle East, where the largest reserves are located, received just 11% of total project announcements in the upstream phase of the value chain in the period analysed, while Latin America and the Caribbean accounted for 14%. Despite their significant participation in the downstream stage, Middle Eastern

countries receive the same share of announcements as countries in Africa (13%), and much less than countries in the Asia-Pacific economies other than China, Hong Kong (China) and Macao (China). As this is an intermediate and very small sector of the oil and natural gas value chain, project announcements classified as midstream do not appear separately from investments in the preceding or succeeding stages of the value chain and, as such, are not present in the database examined.

Figure II.9

Global project announcements in the oil, coal and natural gas sector by region of destination and stage of value chain, 2005–2022
(Percentages of total amount)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

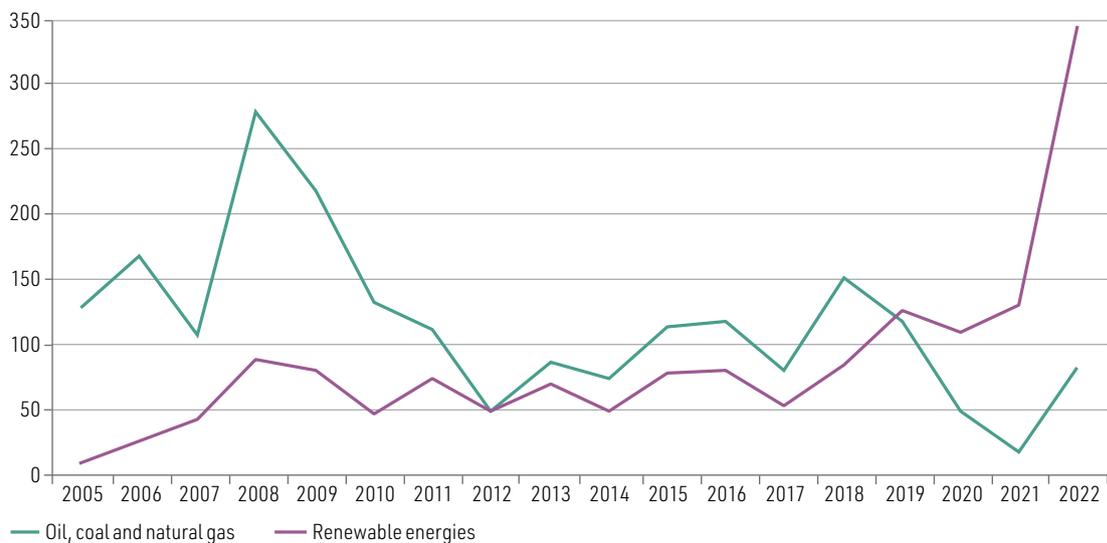
Note: Prospecting, exploration, production and decommissioning activities (upstream); crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream).

The geographical composition can be explained by the fact that FDI flows to oil-producing countries are positively related to market expansion, trade openness, infrastructure endowment and favourable oil price dynamics (Eissa and Elgammal 2020; Yazdanian, 2014). However, Eissa and Elgammal (2020) concluded that the presence of high levels of reserves reduces FDI attraction, owing to the market structure in these countries and the importance of large local national oil companies in the countries' investments, which enables them to avoid the prevalence of FDI as a funding source. Above all in comparison to other regions, the Middle East has firms that can finance the investments needed in the sector with their own resources or funding. The size of the firms in question is again relevant here: in 2022, Saudi Aramco was the firm with the largest market value in the world, US\$ 2.43 trillion in market capitalization in May 2022, surpassing tech giants such as Apple (*The Guardian*, 2022).

Over a longer time horizon (2005–2022) and compared to project announcements in renewables, project announcements in the oil, coal and natural gas sector crested in 2008, with announced investments close to US\$ 280 billion, before dropping back. As of 2019, the renewable energy sector surpassed the conventional energy sector in terms of total value announced, attaining historic levels in 2022 for the energy sector as a whole (see figure II.10). Chapter III contains a discussion of global and regional investments in renewable energies.

Figure II.10

Global project announcements in the energy sector, 2005–2022
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

In terms of the stages of the value chain that have become most internationalized through the installation of new capacities, the downstream stage (62%) has been dominated by project announcements in oil, coal and natural gas in the period analysed (see figure II.11).

Figure II.11

Global project announcements in the oil, coal and natural gas sector by stage of value chain, 2005–2022
(Percentages of amount)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

Note: Prospecting, exploration, production and decommissioning activities (upstream); crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream).

In the downstream stage, the Anglo-Dutch firm, Shell, invested US\$ 27.787 billion in its Canadian subsidiary, with a view to building and operating an LNG export facility in Canada in 2018 (Shell Canada, 2018).

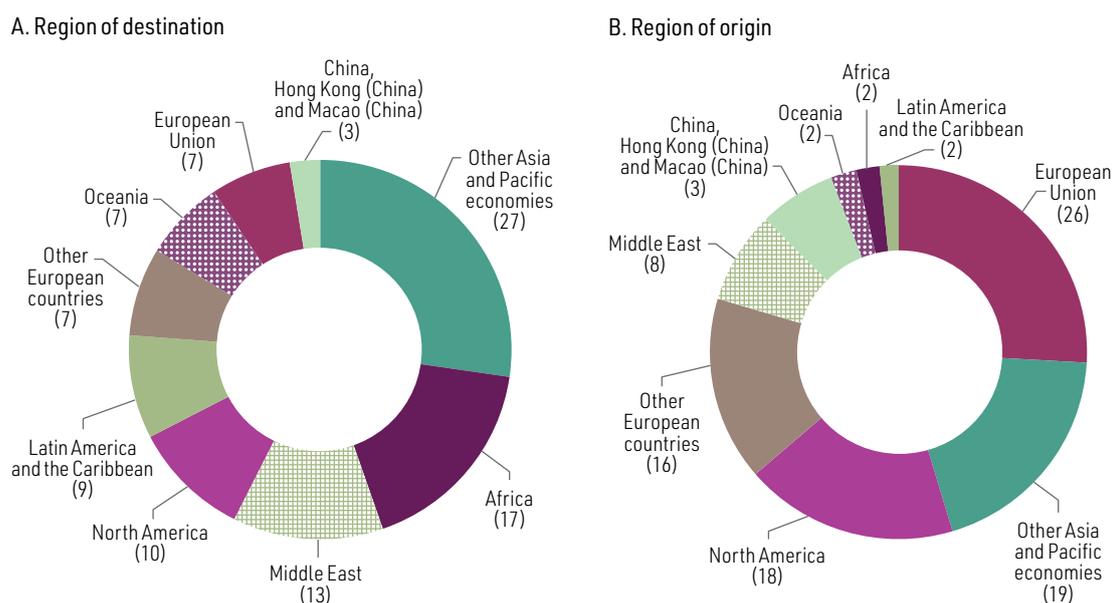
In the upstream stage (38% of the total), two key projects were the US\$ 36.8 billion investment in the Tengiz oil field in Kazakhstan by Chevron, of the United States, and other associated companies

in 2016 (Nurshayeva, 2016); and the largest foreign investment by a Japanese company thus far, namely that of INPEX in 2006, which invested US\$ 32.5 billion in the Ichthys natural gas field in Australia (Austrade, 2023).

Firms based in the European Union account for the largest proportion of the total announced amount (26%), mainly French and Dutch enterprises (8% and 6%, respectively); while the main region of destination for these investments are the Asian economies, excluding China, Hong Kong (China) and Macao (China), which received 27% of the total. This reflects the importance of international oil companies for international capital flows in the sector, since most of these firms are based in advanced economies. Latin America and the Caribbean is the region that receives the fifth largest amount of investment in the sector, absorbing 9% of the total; and it is the lowest ranked region of origin in terms of projects (2% in total) (see figure II.12).

Figure II.12

Global project announcements in the oil, coal and natural gas sector by region of destination and origin, 2005–2022
(Percentages of amount)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

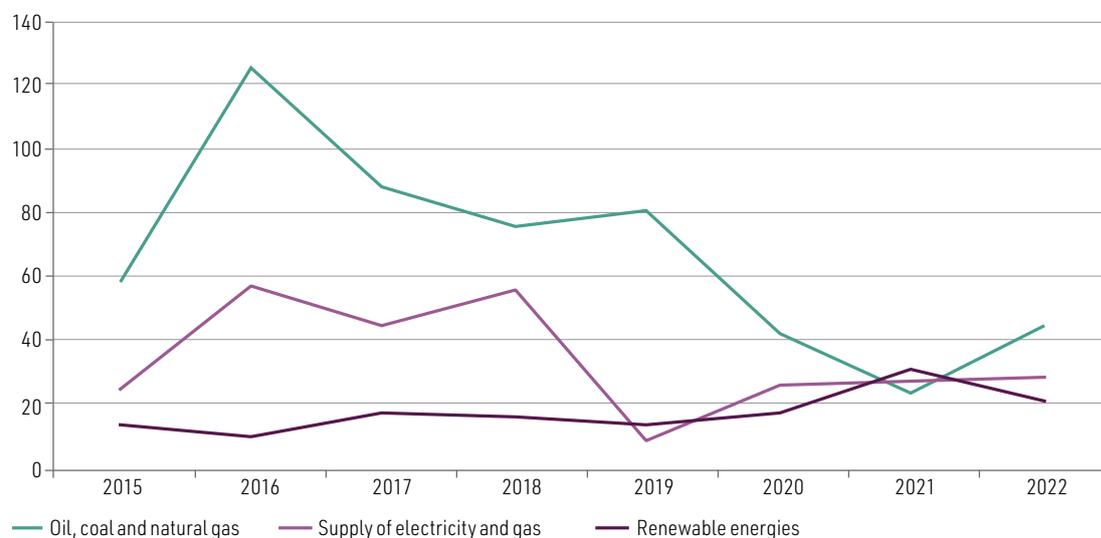
Of the total number of mergers and acquisitions in the energy sector worldwide between 2015 and 2022,⁸ 56% were in the oil, coal and natural gas sector. Following the boom in 2016, driven mainly by the US\$ 61.871 billion mega-merger between Shell and BG Group, the amount of transactions in the sector declined, albeit posting a slight recovery in 2022, owing mainly to the Saudi Aramco gas pipeline lease and leaseback arrangement with a consortium formed by BlackRock Real Assets and Hassana Investment Company for US\$ 15.5 billion (Saudi Aramco, 2021).

The predominance of conventional energy sources over renewables in cross-border M&A has been sustained continuously since 2015, except in 2021 (see figure II.13). At that time, falling international oil and natural gas prices, associated mainly with the effects of the COVID-19 pandemic, acted as a disincentive for the sector. Nonetheless, a change can be detected in the mergers and acquisitions strategy of firms in the conventional energy sector, which have redirected their interests away from building resilience towards the purchase of low-carbon assets, thus already targeting their long term towards the energy transition (Deloitte, 2023).

⁸ Considered in the Bloomberg database as encompassing oil, coal and natural gas; electricity and gas supply; and renewable energies.

Figure II.13

Global trend in cross-border mergers and acquisitions in the energy sector (2015–2022)
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

Table II.5 lists the top 10 cross-border mergers and acquisitions in the non-renewable energies sector in 2015–2022. The firms in question are located mainly in advanced economies (Canada, Sweden, the United Kingdom and the United States), except for three transactions with firms acquired in Saudi Arabia, the Russian Federation and India.

Table II.5

Ten largest cross-border mergers and acquisitions in the non-renewable energies sector worldwide, 2015–2022

(Percentages and billions of dollars)

Year	Firm	Country of origin	Assets acquired	Percentage	Country of assets	Industry	Amount (Billions of dollars)
2016	Shell	Netherlands	BG Group	100	United Kingdom	Oil and natural gas ^a	70.050
2017	Enbridge Inc	Canada	Spectra Energy	100	United States	Oil and natural gas ^b	28.000
2021	Seven & i Holdings	Japan	Speedway	100	United States	Oil and natural gas ^c	21.000
2018	Energy Capital Partners (ECP), Access Industries, Canada Pension Plan Investment Board	United States, Canada	Calpine Corporation	100	United States	Electric power generation from natural gas ^c	17.138
2022	BlackRock Real Assets, Hassana Investment Company and others	Singapore, Saudi Arabia, China, United States	Saudi Aramco gas supply	49	Saudi Arabia	Oil and natural gas ^a	15.500
2022	Aker BP	Norway	Lundin Energy	100	Sweden	Oil and natural gas ^a	13.900
2015	Repsol	Spain	Talisman Energy Inc (Repsol Oil & Gas Canada)	100	Canada	Oil and natural gas ^a	12.949
2016	Rosneft, Trafigura Group and others	Russian Federation, India	Nayara Energy	98	India	Oil and natural gas ^c	12.909

Year	Firm	Country of origin	Assets acquired	Percentage	Country of assets	Industry	Amount (Billions of dollars)
2016	TC Energy Corporation	Canada	Columbia Pipeline Group Inc	100	United States	Oil and natural gas ^b	12.026
2016	Acquisition among several firms	Switzerland, Qatar	Rosneft Oil Co PJSC	19.5	Russian Federation	Oil and natural gas ^{abc}	11.281

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

^a Prospecting, exploration, production and decommissioning activities (upstream).

^b Crude oil and natural gas transportation and storage activities (midstream).

^c Crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream).

In terms of the total number of mergers and acquisitions, North America continues to dominate the top 10 transactions. Firms from this region acquired the most assets in the oil, coal and natural gas sector (30% in total), with Canadian firms accounting for 21% of all transactions in the sector. Among the latter, US\$ 91.853 billion (80% of the total) occurred in the midstream stage of the sector's value chain. In second place, European Union firms have made significant cross-border acquisitions (27% of the total amount), including purchases by Dutch firms, mainly due to the mega-operations of Shell (now Anglo-Dutch), as shown in table II.4.

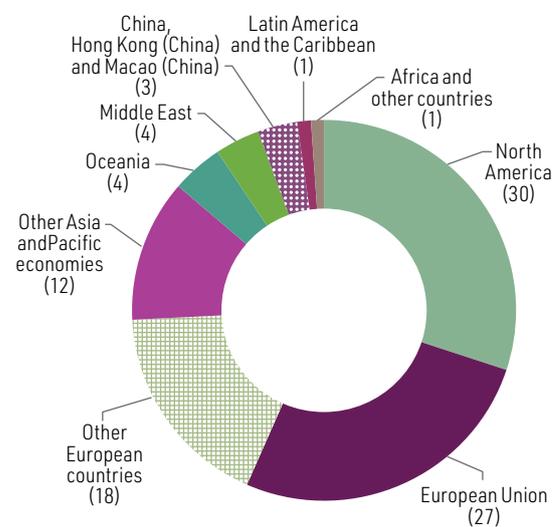
North America is the destination of the main transactions (40% of the total amount), with the United States accounting for 35% of the total. Assets in non-EU European countries accounted for 19% of total transactions in value terms in the period analysed, mainly in the United Kingdom (14%) and the Russian Federation (5%) (see figure II.14).

Figure II.14

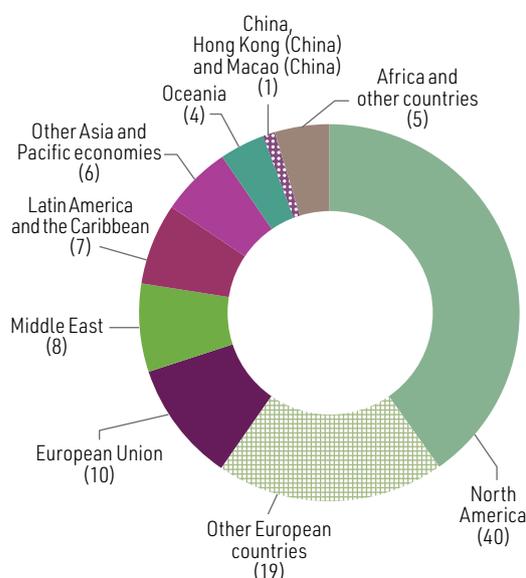
Mergers and acquisitions in the oil, coal and natural gas sector by region of origin and destination, 2015–2022

(Percentages of amount)

A. Region of origin



B. Region of destination



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

The momentum of cross-border capital movements in the oil and natural gas sector has thus been concentrated in the United States and Europe, which are the origin and destination of over half (by amount) of transactions closed between 2015 and 2022. The regions ranked next are the Middle East and Latin America and the Caribbean as destinations for the investments, and the other Asia-Pacific economies and Oceania as the origin of the capital invested.

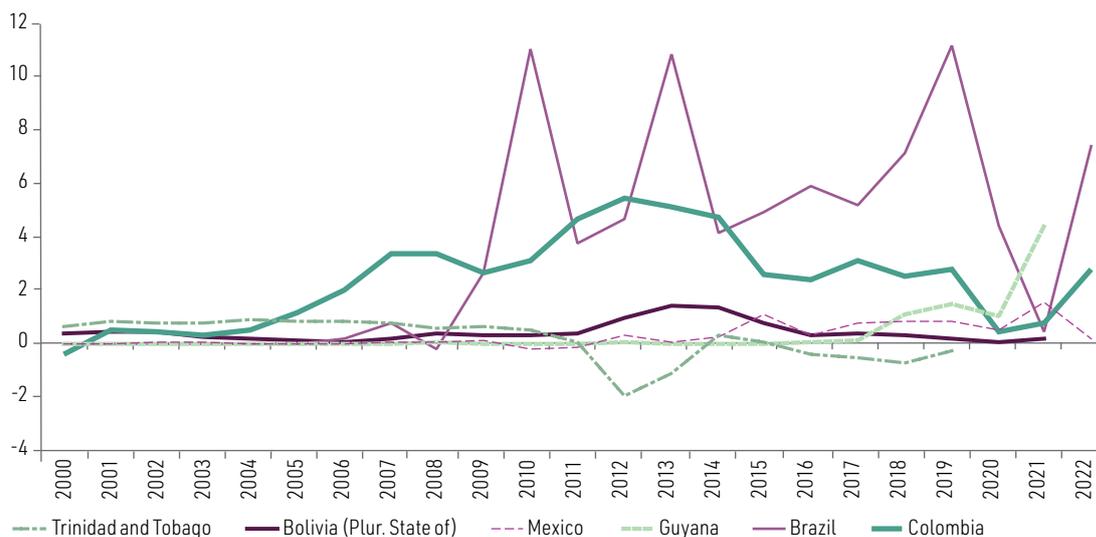
2. Transnationals from other regions lead investments in Latin America and the Caribbean

Inward FDI in the non-renewable energies sector in Latin America and the Caribbean reflects not only the high volatility inherent to the sector, which stems mainly from fluctuations in the prices of such energy sources on international markets, but also the discovery of new hydrocarbon sources in the region and changes in the structure of local markets. The regulation of foreign capital inflows into the industry is a key factor in understanding the dynamics of FDI in the sector.

It is possible to identify FDI entering the hydrocarbons sector in six of the region's countries (Brazil, Colombia, Guyana, Mexico, the Plurinational State of Bolivia, and Trinidad and Tobago).⁹ Between 2000 and 2022, these six countries absorbed an annual average of US\$ 7.214 billion channelled to the sector; and, despite high volatility, Brazil and Colombia generally receive much larger volumes of FDI in the sector than the other countries (figure II.15).

Figure II.15

Latin America and the Caribbean (selected countries): FDI inflows in the hydrocarbons sector (2000–2022)
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of official data.

Larger inflows in certain years may be associated with the discovery of oil reserves. An example is Guyana since 2018, where average FDI inflows in the sector rose from US\$ 6 million per year in the decade between 2002 and 2011 to US\$ 814 million per year in 2012–2021. Since then, FDI in the sector has accounted on average for more than 90% of the country's total inflows. In the case of Brazil, large inflows occurred following the discovery of the pre-salt reserves in 2006 and after changes were made to the sector regulatory framework, starting in 2016.

⁹ Countries that publish FDI statistics with a level of disaggregation that is sufficient for sectoral analysis.

In Brazil and Mexico, the hydrocarbons sector absorbed smaller share of total FDI inflows than the other sectors in the last decade (just 10% and 2%, respectively). In contrast, in the Plurinational State of Bolivia, FDI inflows in the hydrocarbons sector averaged 44% of the total between 2012 and 2022, peaking at 69% in 2013. Although declining since then, the sector still receives a large share of total inflows (17% in 2021).

In Colombia, FDI in the oil sector increased after the sector was restructured in June 2003.¹⁰ At that time, the state-owned Empresa Colombiana de Petróleo became Ecopetrol S.A. and ceased to perform regulatory functions. The latter were taken over by the National Hydrocarbons Agency (ANH), which was created at the same time. This change also signalled the country's incursion into the concessions regime, with the adoption of exploration and production contracts that became more attractive for international investment than the previously existing association arrangement (Espinasa, Medina and Tarre, 2016).

In Mexico, FDI in the oil sector has historically been heavily regulated, except between 2013 and 2018, when mechanisms aimed at loosening the PEMEX monopoly were in operation and attracted large amounts of FDI. From an average of US\$ 17 million per year of inward FDI in oil and gas extraction between 2005 and 2013, average inflows grew to US\$ 696 million per year in 2014–2022. It is worth noting that only US\$ 190 million was reported in the latter year, the smallest inflow since 2013, which may be a result of recent amendments to the Mexican law liberalizing the oil market (Jaramillo, 2021) (see box II.2).

Box II.2

Latin America and the Caribbean: new discoveries and unconventional hydrocarbon sources

Since the middle of the 2000 decade, several of the region's countries have discovered unconventional reserves with potential for near-term oil and natural gas production, which has already attracted international investors. Unconventional reserves contain oil or natural gas held in low permeability reservoirs, which are considered relatively immobile and therefore cannot be extracted by traditional methods. These hydrocarbons generally need to undergo dilution or upgrading processes before they can be put to commercial use (ISC/World Petroleum Council, 2013; Gordon, 2012). The production of unconventional oil or natural gas is therefore costly and requires a higher return on resources and know-how. This makes it a viable investment only in a context of favourable prices and a future scenario that involves continued expansion of fossil fuel demand (ECLAC, 2022; EIA, 2023). Reserves of this type include the pre-salt deposits in Brazil, deepwater blocks in Guyana and the Vaca Muerta shale reserves in Argentina.

Brazil - Pre-salt

The pre-salt is a sequence of sedimentary rocks formed more than 100 million years ago in the South Atlantic where oil and natural gas deposits have formed under a 2,000-metre-thick layer of salt (Petrobras, n.d.). In 2006, Brazil's state-owned Petrobras announced the discovery of the first large reserves of commercially valuable light oil in deep rock layers beneath this thick layer of salt. This discovery placed Brazil among the world's leading oil fields and led to the creation of a new regulatory framework to manage the assets in question, including the production sharing system, the sovereign Social Fund, and the creation of Pré-Sal Petróleo S.A (a state-owned firm to manage the assets), among other measures related to the discovery (Viana, 2012).

Since the first discoveries, six rounds of bidding have been held for pre-salt exploration under production sharing arrangements. A total of 15 blocks were awarded to consortiums formed by 29 foreign firms, culminating in the collection of some US\$ 12.882 billion in signing bonuses and about US\$ 1.067 billion for the minimum exploratory programme (which includes the commitment to carry out activities such as seismic surveys and the drilling of exploratory wells) (ANP, n.d. and 2021).

¹⁰ Decree 1760 of 26 June 2003.

However, management of the pre-salt blocks and their resources has proven complex. The 2019 bid under the sharing arrangement was considered disappointing by the Brazilian government. This gave rise to discussions on exploration regimes for the pre-salt blocks, considering whether other arrangements, such as the concession regime, could attract more international interest (Nogueira, Viga Gaier and Slattery, 2019). Given the unsatisfactory performance of the state-owned firm's asset sale program and the international conjuncture of the sector, the new management of the state-owned firm and the newly appointed Brazilian government are expected to bring the issue to the table for discussion.

Guyana - Stabroek

Following the first discoveries of offshore oil deposits in 2015, arising from the exploration and exploitation activities of ExxonMobil of the United States, Guyana has been expanding not only its oil reserves each year, but also the oil produced and the revenues derived from the resources (*El Observador*, 2022). The share of the oil, coal and natural gas sector in Guyana's FDI flows averaged 71% between 2016 and 2021, when the first investments linked to discoveries in the Stabroek block were made (ECLAC, 2022). Projections indicate that Guyana will consolidate its position as the world's fourth largest offshore oil producer by 2035, ahead of countries such as the United States, Mexico and Norway (*El Observador*, 2022).

The dynamic performance of the sector is supported by the volume of greenfield project announcements in the country. According to the fDi Markets database, whereas projects totalling US\$ 8 million were announced in Guyana in 2020 (the first investments in the sector since 2013), a total of US\$ 33 million was announced in 2021, and in 2022 the figure surged to US\$ 10.033 billion. All of these investments were made in the initial (upstream) phase of the value chain.

In a hydrocarbon market that is increasingly competitive, in terms of both price and carbon intensity, Guyana's oil is highly competitive. Most of the resources extracted in the country are of the light variety, with low exploration costs and an emissions intensity below the world average (Forbes 2020; *El Observador*, 2022).

Royalties and tax revenues from exploration of the resource are projected to total US\$ 13 billion by 2029 (Forbes, 2020). These figures highlight the economic importance of oil production for Guyana, and the potential for the country's future productive development represented by the use of these resources.

Argentina - Vaca Muerta

Located in the Argentine province of Neuquén, Vaca Muerta is a geological formation of about 30,000 square kilometres containing oil and natural gas at a depth of more than 2,500 metres (YPF, n.d.). Although the reserves located in the formation have been known about since 1931, it was only in 2010 that the first wells were drilled and the feasibility of exploiting the enormous oil and natural gas potential found there was discovered (IAPG, n.d.).

Located in a shale-type geological formation, with very little porosity and virtually impermeable, its extraction only gained momentum with the spread of exploration technologies such as fracking, developed and widely employed in the United States in a context of high oil prices, when this became economically viable (López Anadón, 2015).

According to the Argentine government, in 2018 Vaca Muerta contained the second largest unconventional natural gas reservoir in the world and the fourth largest unconventional oil reservoir. Thirty-one firms are expected to have a stake in the venture, with Argentina's state-owned YPF holding the concession for 40% of the Vaca Muerta area. Nonetheless, its development has been attracting great attention from international investors: since 2010, the province of Neuquén has received 49% of the total amount of project announcements in the oil and gas sector in Argentina. This includes two key projects launched by foreign firms. The first is an investment by Chevron, amounting to US\$ 16.2 billion over a 35-year period. Although the project covers only 1% of Vaca Muerta, the province of Neuquén is expected to receive US\$ 8.5 billion from YPF for this purpose (YPF, n.d.).

Another company with prominent operations in the region is Petronas of Malaysia, which in 2018 announced a total project of US\$ 2.3 billion. Although its investment in Vaca Muerta represents just 0.6% of the total area of the geological formation, the Malaysian firm's investments could amount to US\$ 7 billion over a 20-year period (Ministry of Economy, 2018; YPF, n.d.).

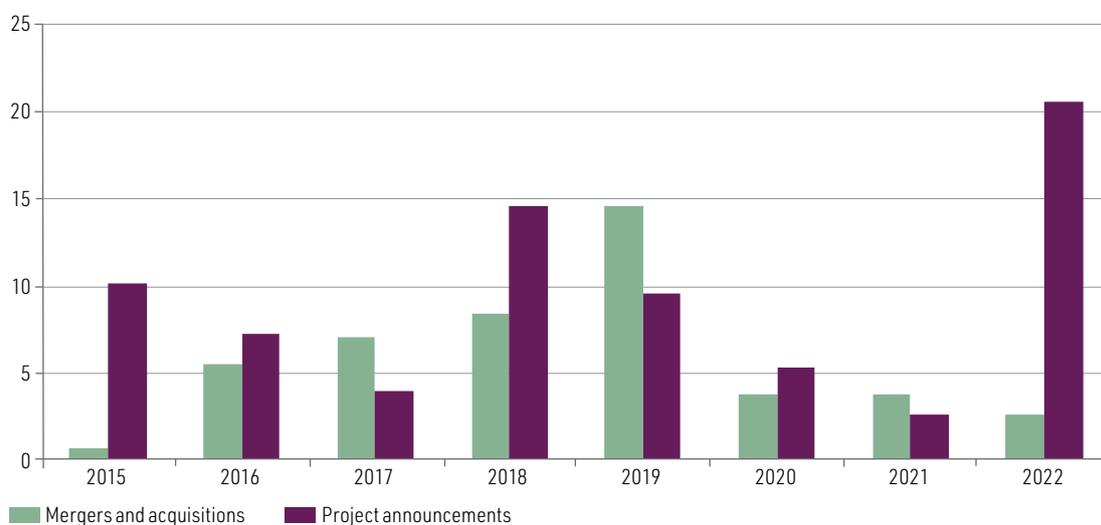
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Systems and Communications Limited (ISC)/World Petroleum Council, *World Petroleum Council Guide: Unconventional Oil*, London, 2013; D. Gordon, "Understanding unconventional oil", *The Carnegie Papers*, Washington, D.C., Carnegie Endowment for International Peace (CEIP), 2012; ECLAC, *Foreign Direct Investment in Latin America and the Caribbean, 2022* (LC/PUB.2022/12-P), Santiago, 2022; Energy Information Administration (EIA), "Oil and petroleum products explained: where our oil comes from", April 2023 [online] <https://www.eia.gov/energyexplained/oil-and-petroleum-products/where-our-oil-comes-from-in-depth.php>; Petrobras, "Pré-Sal", n.d. [online] <https://petrobras.com.br/pt/nossas-atividades/areas-de-atuacao/exploracao-e-producao-de-petroleo-e-gas/pre-sal/>; C. R. C. Viana, "A evolução do monopólio do petróleo e o novo marco regulatório do pré-sal", *Revista Brasileira de Direito do Petróleo, Gás e Energia*, vol. 3, 2012; National Agency of Petroleum, Natural Gas and Biofuels (ANP), "Resultados", n.d. [online] <https://www.gov.br/anp/pt-br/rodadas-anp/rodadas-concluidas/resultados/resultados> [accessed on 26 March 2023]; ANP, "Os regimes de concessão e de partilha", 2021 [online] <https://www.gov.br/anp/pt-br/rodadas-anp/entenda-as-rodadas/os-regimes-de-concessao-e-de-partilha>; M. Nogueira, R. Viga Gaier and G. Slattery, "Leilão do pré-sal decepciona; governo avalia mudança após atuação da Petrobras", 7 November 2019 [online] <https://www.reuters.com/article/energia-aram-idLTAKBN1XH1SB>; *El Observador*, "Guyana: la producción petrolera offshore podría superar la de Estados Unidos, México y Noruega", 4 August 2022 [online] <https://www.elobservador.com.uy/nota/guyana-la-produccion-petrolera-offshore-podria-superar-la-de-estados-unidos-mexico-y-noruega-202284211119>; Financial Times, fDi Markets [online database] <https://www.fdimarkets.com/>; Forbes, "Guyana: global oil's new king of the heap", 6 March 2020 [online] <https://www.forbes.com/sites/woodmackenzie/2020/03/06/guyana-global-oils-new-king-of-the-heap/>; YPF, "Vaca Muerta", n.d. [online] <https://www.ypf.com/desafiovacamuerta/Paginas/index1.html>; Instituto Argentino del Petróleo y del Gas (IAPG), "Vaca Muerta", n.d. [online] <http://www.shaleenargentina.com.ar/vaca-muerta> [accessed on 26 March 2023]; E. López Anadón, *El abecé de los hidrocarburos en reservorios no convencionales*, IAPG, Buenos Aires, 2015; Ministry of Economy, "YPF y Petronas invertirán USD 2300 millones en Vaca Muerta para el desarrollo de petróleo no convencional", 4 December 2018 [online] <https://www.argentina.gob.ar/noticias/ypf-y-petronas-invertiran-usd-2300-millones-en-vaca-muerta-para-el-desarrollo-de-petroleo>.

As is happening in the rest of the world, the internationalization of the region's oil, coal and natural gas sector entailed more new investment project announcements than mergers and acquisitions (see figure II.16). The amounts of project announcements and mergers and acquisitions cannot be directly compared, however, because the former are merely investment intentions whereas the latter are accomplished transactions. Nonetheless, during the period under review, the region announced investments in greenfield projects averaging approximately US\$ 9.15 billion per year, compared to an average of US\$ 5.723 billion per year in the case of M&A. However, the inherent volatility of the hydrocarbons sector makes it difficult to identify a clear pattern or trend, since large announcements or transactions generate significant year-on-year variations.

Comparing the amounts of project announcements and cross-border mergers and acquisitions in Latin America and the Caribbean in 2015–2022 reveals that transnational firms wishing to invest in the countries of the region tend to use different instruments, depending on the stage of the value chain in which the venture is located, and according to their pre-existing presence in the destination country. Moreover, the investments tend to complement each other, whether they are related to different modalities or to different stages of the value chain (see figure II.17).

Figure II.16

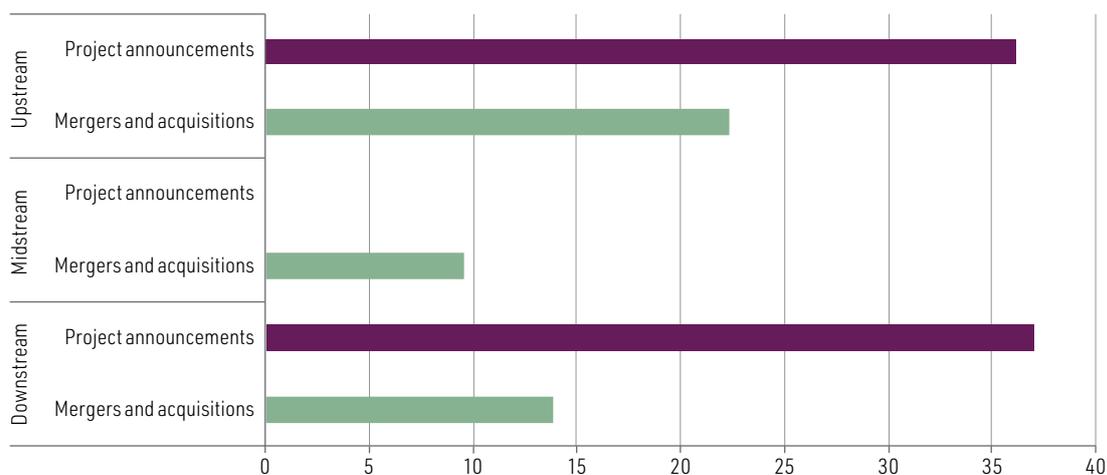
Latin America and the Caribbean: cross-border mergers and acquisitions and project announcements in the oil, coal and natural gas sector, 2015–2022
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg and Financial Times, fDi Markets.

Figure II.17

Latin America and the Caribbean: project announcements and mergers and acquisitions in the oil, coal and natural gas sector, 2015–2022
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg and Financial Times, fDi Markets.

Note: Prospecting, exploration, production and decommissioning activities (upstream); crude oil and natural gas transportation and storage activities (midstream); and crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream).

Unlike the rest of the world, investment announcements in Latin America and the Caribbean are evenly distributed between the upstream and downstream phases. In terms of mergers and acquisitions, interest in Latin American and Caribbean assets is greatest in the upstream segment (49%), followed by downstream (30%) and then midstream (21%). In the upstream segment the profile of assets transacted differs from that of announced projects. Transactions in the upstream segment display the lowest average value between 2015 and 2022 (US\$ 302 million per asset transacted). Conversely,

they represent the highest value associated with each investment project announcement in the upstream segment over the same period (US\$ 670 million). This is explained by the large projects described below.

During the period analysed, the upstream stage accounted for 49% of the amount of project announcements and M&A transactions. However, only 28% of the announcements, in terms of number, corresponded to this stage (compared to 78% in the case of M&A). This is because oil and natural gas exploration, extraction and production are the most capital-intensive activities in this industry, not only involving financial risk, but also requiring major contributions in terms of technologies, capital goods and infrastructure.

In the region, the entry of foreign firms in the upstream stage of the hydrocarbon industry in a country often begins with mergers and acquisitions, first and foremost through the purchase of exploration rights, through the various contractual regimes in force for hydrocarbon exploration in the country in question (bids, licenses, concessions, participations, among others), and the subsequent production of oil and/or natural gas in a previously prospected area. Examples of this are the purchase of oil exploration and production rights in the Santos basin and in the Bacalhau and Roncador fields, both located in Brazil, by consortiums led by the Norwegian firm Equinor ASA (see table II.6).

Table II.6

Latin America and the Caribbean: 10 largest cross-border mergers and acquisitions in the non-renewable energies sector, 2015–2022
(Percentages and billions of dollars)

Year	Firm	Country of origin	Assets acquired	Percentages	Country of assets	Value chain stage	Amount (Billions of dollars)
2019	Engie, Caisse de Dépôt et Placement du Québec (CDPQ)	France, Canada	Transportadora Associada de Gás S.A. (Petrobras SA)	90	Brazil	Crude oil and natural gas transportation and storage activities (midstream).	8.600
2017	Brookfield, others	Singapore, others	Nova Transportadora do Sudeste S/A (Petrobras S.A.)	90	Brazil	Crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream).	5.200
2016	Equinor ASA	Norway	Licence in the Santos basin (Petrobras S.A.)	66	Brazil	Prospecting, exploration, production and decommissioning activities (upstream).	2.500
2016	Anadarko Petroleum Corporation	United States	Freeport-assets in the Gulf of Mexico	100	Mexico	Prospecting, exploration, production and decommissioning activities (upstream).	2.000
2018	Equinor	Norway	Roncador offshore oilfield (Petrobras S.A.)	25	Brazil	Prospecting, exploration, production and decommissioning activities (upstream).	2.000
2021	Mubadala Investment Company	United Arab Emirates	Landulpho Alves Refinery (Petrobras S.A.)	100	Brazil	Crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream).	1.800
2021	Sempra Energy	United States	Infraestrutura Energetica Nova	26.23	Mexico	Crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream).	1.768
2018	TotalEnergies	France	Lapa and Iara oil fields and Termobahia co-generation plant (Petrobras S.A.)	22.5, 35 and 50	Brazil	Crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream).	1.675
2019	Parkland	Canada	SOL Investments Ltd.	75	Barbados	Crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream).	1.612
2019	Petroleum Nasional Berhad	Malaysia	Tartaruga Verde oil field and Module III of the Espadarte field (Petrobras S.A.)	50	Brazil	Prospecting, exploration, production and decommissioning activities (upstream).	1.294

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

After acquiring exploration and production rights, the firms usually expand their on-site developments depending on the viability of local exploration and their business strategy. This takes into account contractual agreements with countries in the region and the positioning of the product in the international market, since there is more incentive to increase production when prices are high. This can be seen by examining the Norwegian firm Equinor's own track record in the region as, in 2022, it announced plans to expand its production capacity in the assets it had acquired in the Santos basin in 2016. A second drilling platform is expected to be built, along with another floating platform and gas pipelines for an estimated value of US\$ 979 million (Offshore Technology, 2022).

Transnational firms can also initiate operations in the upstream stage through other instruments, including production sharing agreements (PSAs).¹¹ These agreements guarantee the firm carrying out the activities a percentage of the oil produced by way of remuneration. Another possibility is investment agreements, which usually cover hydrocarbon exploration and production rights in a defined area and for a specified period of time (Tienhaara, 2011). Whatever the instrument, it is expected that the participating transnational firms will invest more resources and develop other activities in the host country during the lifetime of the agreement. In the case of PSAs, an example is the agreement signed in 2016 between the United States firms ExxonMobil, leader of the consortium, and Hess Corporation, with China National Offshore Oil Corporation (CNOO) for exploration and production in the Stabroek block in Guyana. Following the development of several exploration activities in the last six years, in 2022 the consortium announced that it would invest an additional US\$ 10 billion in just one of the 10 projects that the company expects to implement in the country (Valley Kumar, 2022) (see table II.7).

Table II.7

Latin America and the Caribbean: 10 largest cross-border project announcements in the non-renewable energies sector (2015–2022)

Year	Firm	Country of origin	Country of assets	Value chain stage	Amount (Billions of dollars)
2022	Exxon Mobil	United States	Guyana	Prospecting, exploration, production and decommissioning activities (upstream)	10.000
2022	Woodside Energy (formerly Woodside Petroleum)	Australia	Mexico	Prospecting, exploration, production and decommissioning activities (upstream)	4.500
2015	TransGas Development Systems	United States	Brazil	Crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream)	2.800
2018	Petronas	Malaysia	Argentina	Prospecting, exploration, production and decommissioning activities (upstream)	2.300
2018	Sempra Energy (formerly Sempra Energy Resources)	United States	Mexico	Crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream)	2.000
2018	Golar LNG	Bermuda	Brazil	Crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream)	1.740
2015	Abengoa	Spain	Mexico	Crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream)	1.550
2016	Korea Gas Corporation (KOGAS)	Republic of Korea	Mexico	Crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream)	1.500
2020	BP (British Petroleum)	United Kingdom	Argentina	Crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream)	1.500
2022	BP (formerly British Petroleum)	United Kingdom	Mexico	Crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream)	1.400

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

¹¹ In PSAs, the State, or the national oil company representing it, retains ownership of the oil produced in a given area, but contracts a private company to extract it, in exchange for a pre-agreed percentage of the oil produced.

The “investment agreement” modality was used in the region by Petronas of Malaysia, which set up business in 2015 in Argentina as Petronas E&P to explore shale assets in the Vaca Muerta region, under an agreement with the state-owned YPF. The investment agreement and complementary agreements of 2015 defined various phases of the venture, culminating, among other developments, in 2018 with the announcement of a US\$ 2.3 billion investment project in extractive activities and, in 2022 with the announcement of a strategic partnership to develop an integrated (upstream, midstream, downstream) LNG project (YPF, 2015; Ministry of Economy, 2018; Offshore Energy, 2022).

Project announcements in the upstream stage thus often reflect the expansion plans of firms that, through some contractual instrument and/or asset purchases via mergers and acquisitions, had already started operations in the target country, which is why these announcements are so frequent. In addition to the increase in investments in the oil exploration, extraction and production ventures themselves, and in ancillary activities, experience in the region shows that this expansion can occur vertically. In this case they can involve investments in other stages of the value chain, especially in refineries and channels for distribution to end consumers, both of which are in the downstream stage of the value chain.

As the main functions in the midstream stage involve storage and transportation of the upstream inputs to the downstream stage, the classification of an asset or project as midstream may not be very clear, as the process is fluid and there are often overlaps, especially where operations are conducted in an integrated manner by the same firm. This is reflected in the fact that there are no announcements of projects classified in the midstream phase only; and it can also be seen when considering large-scale mergers and acquisitions, with assets that often share midstream and downstream functions. This is exemplified by the two largest M&A transactions in the region between 2015 and 2022. The larger of these operations is classified as midstream: the sale of 90% of the shares of Transportadora Asociada de Gas S.A. (TAG) to a consortium formed by the French group Engie and the Canadian fund Caisse de Dépôt et Placement du Québec (CDPQ), for US\$ 8.6 billion in 2019, followed the launch of the New Gas Market in the same year (Ministry of Mines and Energy, 2022; Petrobras, 2019).¹² In 2017, Petrobras had already sold 90% of Nova Transportadora do Sudeste’s assets to a consortium led by Brookfield for US\$ 5.2 billion, which turned out to be the first of many assets in the natural gas segment to be traded (see box II.3). Because it involves assets that also link to the final consumer, the transaction in question is classified as downstream, and is related to the electricity and gas distribution utilities industry.

Overall, mergers and acquisitions involving midstream assets represent just 21% of the total allocated to the oil, coal and gas sector in the region between 2015 and 2022. However, they represent just 6% of the number of transactions¹³ and therefore have the highest average transaction value, approximately US\$ 1.591 billion (upstream: US\$ 302 million per transaction; downstream: US\$ 924 million). This reveals the interest of large investors and/or groups of investors in acquiring large-scale mature assets, involving large natural gas storage and distribution infrastructures in the region’s main consuming markets, Brazil and Mexico, such as those described above (see box II.3).

¹² This new institutional framework was intended to foster greater investment in infrastructure in the intermediate and downstream stages of the natural gas chain, and also to make the sector more competitive (Ministry of Mines and Energy, 2022).

¹³ This chapter only analyses transactions and mergers included in the Bloomberg database for which the transaction value is reported.

Box II.3

Changes in the strategy of a large state-owned firm: the case of Petrobras

Regulation, sector policies and institutions shape the orientation and performance of the energy sector. Depending on the approach and configuration adopted, they can drive and promote public and private investments that are more or less aligned with the objectives considered as priorities by governments, whether local productive development, technological capacity building, productive diversification, energy self-sufficiency and diversification, or attraction of foreign investment and competitiveness, among other aims. Thus, the evolution of the regulatory framework and sectoral policies are fundamental elements for positioning the firms' investment and disinvestment policies as an expression of their strategies. The transformations that have taken place in the Brazilian context in recent decades thus elucidate the strategic change that forms the backdrop for the recent wave of asset sales by Petrobras and the tensions surrounding it.

In the 1990s, a policy of market opening and deregulation was launched in Brazil, accompanied by regulatory and management changes in the oil and gas sector that affected Petrobras' trajectory and performance. In 1997, the government adopted Law 9.478, which admitted domestic and foreign investment in oil exploration, production, refining and transportation. Following the opening up of the sector, Petrobras started importing more capital goods and acquiring complete packages of projects and operations from international firms, thus expanding its relationships with foreign suppliers of capital goods (Costa Pinto, 2020).

The discovery of the pre-salt layer in 2006 heralds a new stage in the oil and gas sector, with regulatory and sectoral policy changes and redefinition of the state-owned firm's strategy. Law 12.351 of 2010 amends Law 9.478 of 1997 to provide for the exploration and production of oil, natural gas and other fluid hydrocarbons in both pre-salt and strategic areas, in addition to creating the Social Fund. The government's main objective was to increase society's share in the earnings of the pre-salt layer. To that end it is supporting the national productive sector through the development of local suppliers and an increase in the national content requirement; and by dedicating part of the surplus generated by pre-salt activities to financing social spending (for which the Social Fund was created). In addition, the sharing system was established in the exploration and development of the pre-salt layer, with Petrobras acting as the sole operator.

Within this framework, Petrobras defined its 2007–2011 business plan, in which it proposed to increase production and expand light oil and natural gas reserves, augment refining capacity, increase biomass, petrochemical and fertilizer capacity and boost production. The business model was oriented towards vertical integration and gave continuity to a cycle of major investments for the development of the oil and gas chain, while promoting diversification. In order to explore and develop the pre-salt fields and expand its operations, Petrobras had to expand its investments significantly, especially in the exploration, production and refining stages. Between 2004 and 2013, the state-owned firm increased its investments by an estimated annual average of more than 11%, well above Brazil's rate of gross fixed capital formation, which averaged 7% for the same period (Costa Pinto, 2020).

In 2014, the pace of oil and gas activities slowed around the world. In Brazil, however, the interaction of a set of factors contributed to turning the slowdown into a deep crisis: the sharp drop in international oil prices was compounded by financial difficulties in Petrobras (exacerbated by the sharp devaluation of the real and the long maturity periods of the investments), and the reputation crisis caused by the association of the state-owned firm with the corruption scandals that gained notoriety with the Lava Jato operation. Nonetheless, in this context of crisis, in 2015 the company adopted a divestment strategy to meet its financial challenges.

Following the dismissal of President Dilma Rousseff's government, in 2016 the sector regulatory framework was again amended, with the aim of stimulating the attraction of foreign investment and accelerating the development and production of pre-salt oil. The new government adopted Law 13.365 of 2016, which established that Petrobras would no longer act as the sole operator of the pre-salt layer. It also reduced local content requirements, increased incentives and subsidies to foreign investment and established a fast-track schedule of pre- and post-salt oil auctions.

In this new context, another change was made to Petrobras' strategic orientation. The vision focused on vertical integration gave way to greater specialization, placing emphasis on exploration and production and on deepwater and ultra-deepwater assets, with substantial reserves and high productivity. This new approach

speeds up the implementation of an ambitious divestment plan targeting mature assets, with which it expects to increase its cash flow, reduce the net debt ratio and release funds for investments in more strategic areas (BNamericas, 2019). In late 2022, before the change of government, Petrobras approved its strategic plan for 2023–2027 in which it aims to restore pre-crisis investment levels (a total of US\$ 78 billion over the next five years) and includes asset divestments. With the change of government and the appointment of a new general manager and board of directors of the state-owned firm in 2023, it is possible that Petrobras' strategy could be reviewed, so its future remains an open question (Reuters 2023).

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of E. Costa Pinto, "Nacionalismo energético, Petrobras e desenvolvimento brasileiro: a retomada interdita", *OIKOS*, vol. 19, No. 1, 2020; BNamericas, "Bajo la lupa: los planes de desinversión de Petrobras", 2019 [online] <https://www.bnamericas.com/es/reportajes/bajo-la-lupa-los-planes-de-desinversion-de-petrobras>; and Reuters, "Brasileña Petrobras dice revisión de desinversiones e inversiones se basará en plan estratégico", 29 March 2023 [online] <https://es.investing.com/news/stock-market-news/brasilena-petrobras-dice-revision-de-desinversiones-e-inversiones-se-basara-en-plan-estrategico-2378538>.

In the downstream stage, not only is the profile of assets traded in M&A very different from that of projects, but the amounts of the investments also differ. Project announcements at this stage of the value chain have the lowest value per transaction, but are the largest in number; 79% of announcements occur in this stage, with an average value of US\$ 258 million per project. The values associated with M&A transactions at the same stage of the value chain are more than three times higher on average (US\$ 924 million per transaction).

In addition to the acquisition of Nova Transportadora Do Sudeste S/A mentioned above, there were two other key operations in the downstream stage, both of which involved the purchase of assets in the stage of retail distribution of hydrocarbons to the final consumer. In 2019 the Canadian firm Parkland Corporation acquired 75% of the operations of SOL, a Barbados-based fuel distributor serving Caribbean countries and territories, for US\$ 1.612 billion (Parkland 2018). In a similar case, the Chilean firm Copec purchased rights from ExxonMobil to produce and distribute Mobil lubricants in the markets of Colombia, Ecuador and Peru, and it renewed its contract in Chile. The transaction was finalized in 2018 for US\$ 747 million (San Juan, 2016).

Project announcements in the downstream stage in the region have a very different profile, dominated by projects of large European firms in the energy sector, related to the construction and operation of electricity generating plants from fossil fuel sources, especially natural gas. The largest announcement of the period corresponds to the construction of a coal gasification and fertilizer production complex in southern Brazil by TransGas Development Systems of the United States. The project was announced in 2015 and amounts to some US\$ 2.8 billion. Another key announcement in the period under review is the contract awarded by Mexico's Federal Electricity Commission (CFE) to the Spanish firm Abengoa to build a combined cycle power plant, which was announced in 2015 for US\$ 1.55 billion (Reuters, 2015).

Three projects related to the construction and operation of thermoelectric power plants linked to natural gas obtained from Brazilian pre-salt exploration, were announced in 2019. The two largest are linked to Gás Natural Açú (GNA), a joint venture between Germany's Siemens, Britain's BP and Brazil's Prumo Logística. This will be the largest natural gas-fired thermoelectric complex in Latin America, located in the logistics complex of the Port of Açú, in the state of Rio de Janeiro. Totalling US\$ 2.2 billion, the announced ventures involve LNG regasification and electric power generation and transmission (Ennes, 2019; Ministry of Energy and Mines, 2019).¹⁴

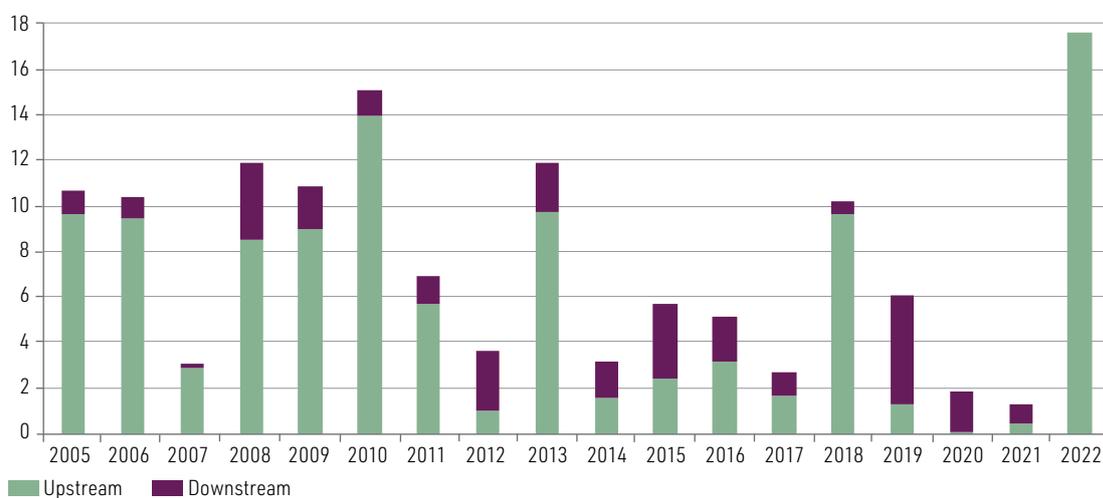
¹⁴ The project has been financed by the National Bank for Economic and Social Development (BNDES) and the International Finance Corporation (IFC) (Ennes, 2019).

In the same year, the joint venture between the Anglo-Dutch firm Shell, Japan's Mitsubishi Hitachi Power Systems (MHPS) and a Brazilian investment fund, Pátria Investimentos, announced that it intends to invest 700 million reais in the construction and operation of the Marlim Azul natural-gas fired thermoelectric power plant, also in the state of Rio de Janeiro. The project was the first to win auctions for natural gas obtained from pre-salt exploration, which will be supplied to the plant by Shell itself, thus guaranteeing the gas production demand of the firm's upstream business (Shell Brasil, 2019).

Considering the period 2005–2022, including years prior to those analysed above, 56% of project announcements have been in the upstream phase (see figure II.18). However, the largest project announcement between 2005 and 2010 was in the downstream stage in the Bolivarian Republic of Venezuela in 2005, when Chevron, in consortium with the Spanish firm Repsol, announced investments worth some US\$ 5 billion to expand its extra-heavy crude oil production and refining capacity in the country (*CincoDías*, 2005). The second largest project in this downstream stage was also revealed during this period: in 2006, Repsol announced that it would participate in building and operating a natural gas liquefaction plant in Peru—a project valued at US\$ 3.1 billion (EuropaPress, 2006). The participating firms were already operating in the upstream stage in the destination countries, thus expanding their integrated activities in the value chain.

Figure II.18

Latin America and the Caribbean: project announcements in the oil, coal and natural gas sector by stage of value chain and amount, 2005–2022
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on data from the Financial Times, fDi Markets.

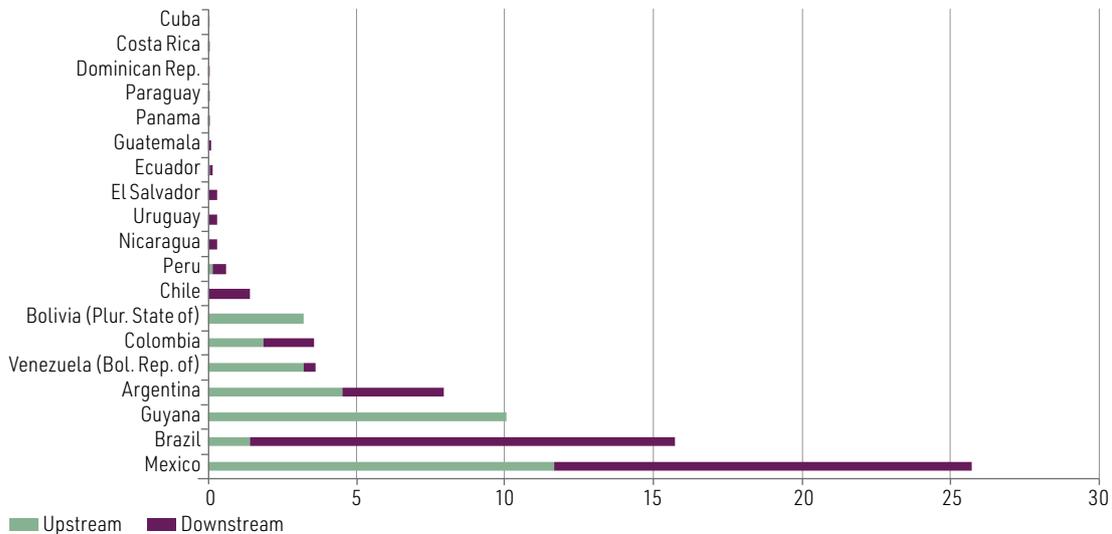
Naturally, the distribution of investments in the region depends on the availability of hydrocarbon reserves; but it also depends on other factors, such as the size of the consuming market and the existence of the infrastructure needed to make its production and sale viable. Furthermore, experience in Latin America and the Caribbean shows that the plurality of contractual arrangements related to the exploration and production of these resources are also relevant when analysing the distribution of investments. The main destinations for both M&A and project announcements are those with the largest reserves and consumer markets.

Mexico is the destination for 35% of all project announcements, by amount, between 2005 and 2022, followed by Brazil (21%) and Guyana (14%) (see figure II.19). Only eight of the 19 countries in the region that were destinations for project announcements in the oil, coal and natural gas sector between 2015 and 2022 saw announcements in both stages of the value chain evaluated. This not only reflects opportunities related to their reserves, but also their consumer market.

Figure II.19

Latin America and the Caribbean: project announcements in the oil, coal and natural gas sector by stage of value chain and country, 2015–2022

(Billions of dollars)



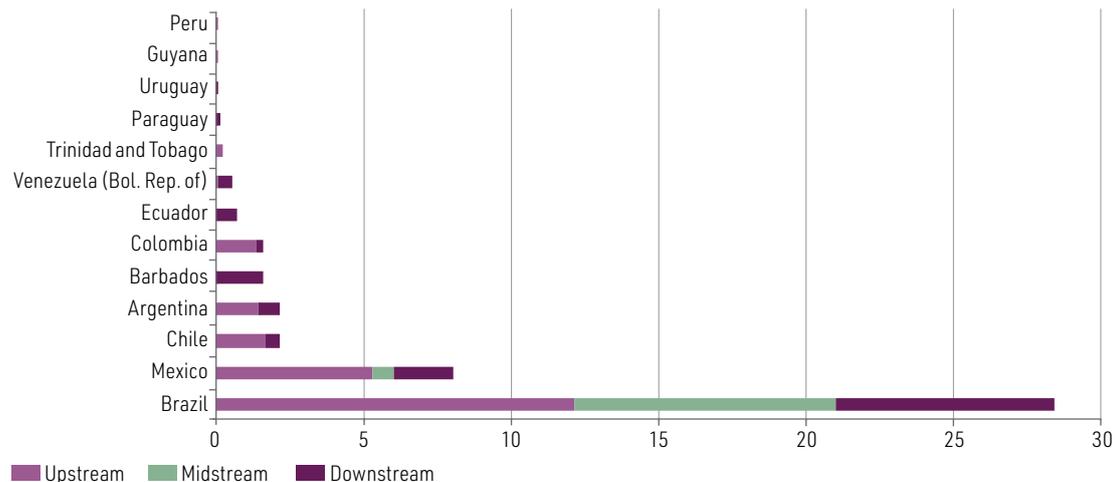
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.
Note: Prospecting, exploration, production and decommissioning activities (upstream); crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream).

In contrast, the M&A market is much more concentrated than that of project announcements, not only in terms of the set of participating countries (just 13 compared to 19 countries with project announcements), but also because Brazil is the destination for more than half of the transactions (62%), followed by Mexico (18%). Moreover, only Argentina, Brazil and Mexico reported operations in all three stages of the value chain (see figure II.20).

Figure II.20

Latin America and the Caribbean: mergers and acquisitions in the oil, coal and natural gas sector by stage of value chain and country, 2015–2022

(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.
Note: Prospecting, exploration, production and decommissioning activities (upstream); crude oil and natural gas transportation and storage activities (midstream); and crude oil and natural gas refining or processing, distribution, sale and end-use activities (downstream).

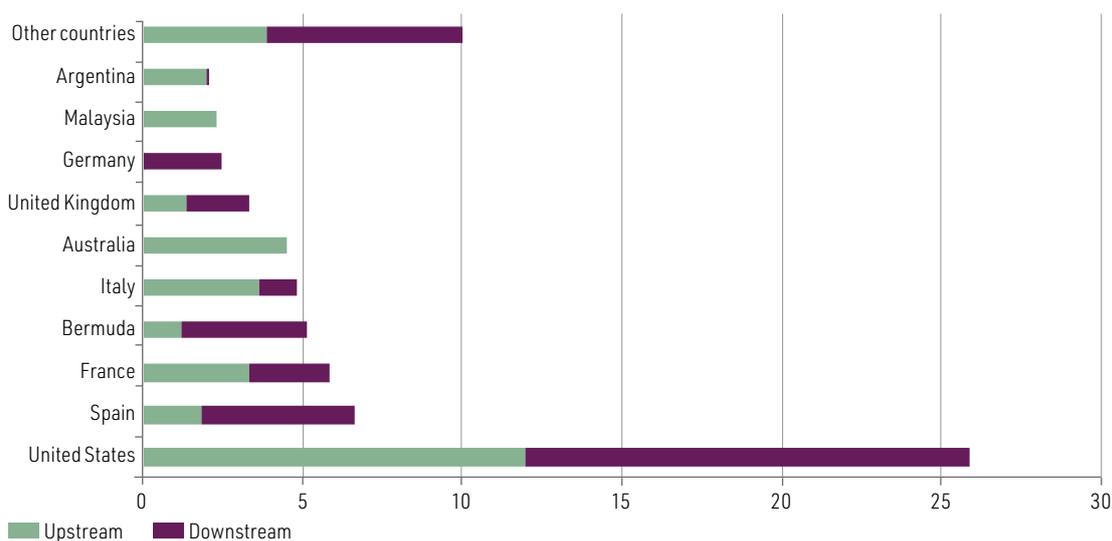
In terms of the origin of the resources invested or announced in the region, large international oil companies predominate, especially those from the United States and France. However, once again the large sums invested in certain projects, in an industry of high capital intensity, make it difficult to identify trends.

This can be seen clearly in the project announcements. Between 2015 and 2022, 35% of project announcements in Latin America and the Caribbean were made by United States firms (figure II.21). In this regard, the figures are biased by ExxonMobil's US\$ 10 billion project in Guyana in 2022, making the firm the largest single investor in the entire region between 2015 and 2022. Bermuda is also the fourth largest source of funds in the region. The country's tax framework encourages firms from other origins to register their headquarters in the country. Project announcements originating in the region's countries represent just 1% of the total, originating in Chile, Mexico and the Plurinational State of Bolivia.

Figure II.21

Latin America and the Caribbean: project announcements in the oil, coal and natural gas sector by stage of value chain and country of origin, 2015–2022

(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

Note: Prospecting, exploration, production and decommissioning activities (upstream); crude oil and natural gas refining or processing activities, distribution, sale and final use (downstream).

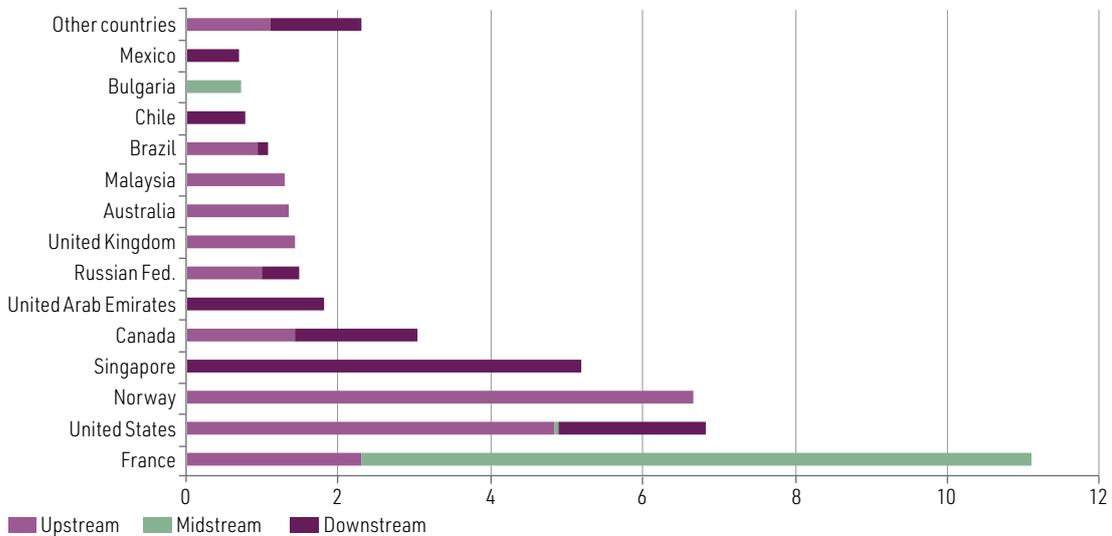
In the case of mergers and acquisitions, French firms are the main buyers of Latin American assets (24% of total value), followed by firms from the United States (15%). However, consortiums and investment funds are the main individual investors, operating mainly in the downstream and midstream stages of the industry's value chain. This explains the presence of firms from Singapore and the United Arab Emirates among the top 10 investors in the sector (see figure II.22).

In the past, large Latin American national oil companies harnessed the wave of privatizations in the region in the 1990s to acquire assets in neighbouring countries, in order to increase access to hydrocarbon reserves, guarantee demand for their own production and vertically integrate their businesses (ECLAC, 2006). However, given the need for large amounts of capital and the unfavourable domestic situation, as well as the change in strategy of some of the main firms in the region (see box II.3), this scenario has changed. Only 4% of all project announcements and 7% of M&A in the oil, coal and natural gas sector between 2015 and 2022 originated from trans-Latin firms, predominantly in the upstream stage of the value chain.

Figure II.22

Latin America and the Caribbean: mergers and acquisitions by stage of value chain and country origin, 2015–2022

(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

Note: Prospecting, exploration, production and decommissioning activities (upstream); crude oil and natural gas transportation and storage activities (midstream); and crude oil and natural gas refining or processing, distribution, sale and end-use activities (downstream).

In value terms, 77% of announced projects correspond to the plans of the Argentine firm Hokchi to extract oil and natural gas in shallow waters off Mexico, which is the largest recipient of project announcements in the region (76% of total value) (MexicoNow, 2018). In terms of M&A, the Brazilian firm Raizen accounts for 32% of the total value invested in the region. In 2018, it bought Shell's midstream and downstream assets in Argentina for US\$ 916 million. The Brazilian enterprise, which is a joint venture between Shell itself and Cosan, also of Brazil, then went on to gain control of the Buenos Aires refinery, 645 service stations and other assets, representing another example of vertical integration in the region (Hidalgo, 2018; Shell Argentina, 2018).

In conclusion, investments in the upstream stage of the oil, coal and natural gas value chain are usually the starting point from which transnational firms execute their strategy in Latin America and the Caribbean. This defines the growth of their investments in the expansion of existing projects, other similar ventures, or other stages of the value chain that promote the processing and distribution of the extracted hydrocarbons.

In terms of potential FDI attraction strategies, the downstream stage seems to be the most interesting. Investments in refining could add value to the crude oil and natural gas produced and make it possible to transport the hydrocarbons to ever more distant markets, which is important in the current situation of high energy demand and pressure on international prices. Investments in transportation and distribution are also needed, to enable energy obtained from hydrocarbon exploration to reach the region's consumer markets in its various forms. Thus, projects such as the Açú port complex in the Brazilian state of Rio de Janeiro could facilitate the flow of production from recent discoveries in the region to domestic and foreign markets, in addition to creating jobs in other related industries, as will be explained in the following sections.

D. Challenges and opportunities for Latin America and the Caribbean

The transition to a low-carbon economy involves inherent contradictions. While there are incentives to invest in low-carbon energy sources and warnings against reliance on finite and non-renewable sources, which have a considerable negative environmental impact, the region's countries also have the opportunity to generate income and attract investment based on these resources. The countries of Latin America and the Caribbean vary greatly in terms of their potential for entering the hydrocarbon chain and attracting investment in the sector. Nonetheless, this section aims to describe challenges, opportunities and instruments for income generation and productive development that might be common to the region and serve as inputs enabling governments and decision makers to define their role in managing the energy transition.

1. An unavoidable risk factor: stranded assets in the context of the energy transition

The analysis of FDI flows, project announcements and mergers and acquisitions in the oil, coal and natural gas sector in Latin America and the Caribbean demonstrates the interest that transnational corporations have in the region in the short term, especially in light of the new discoveries of hydrocarbon reserves and an international context of high energy prices and robust demand.

However, climate change cannot be combated without an energy transition; and the demand for energy from non-renewable sources is expected to decline dramatically in the medium and long terms. This is highly problematic in an industry where investments are capital intensive and have a payback period that lasts several decades. The risk of obsolescence would imply huge financial losses and socioenvironmental impacts, particularly since these projects are capital-intensive and therefore have high financial costs. This situation could deter potential investors who want to commit to a long-term strategy which, if complemented by suitable policies, would potentially benefit the development of the countries in the region. The materialization of this risk is the “stranded-assets” problem.

Stranded assets can be defined as assets that have suffered from unanticipated or premature write-downs, devaluations, or conversion to liabilities (Caldecott and others 2016) as a result of some exogenous factor. In the context of the energy transition, fossil fuel reserves, and other capital investments for the exploration, production and refining of these energy sources can be rendered inoperable, because of the need to fulfil climate commitments. As a result, they become liabilities before the end of the payback period, or the corresponding installations have to be decommissioned prematurely, turning them into stranded assets (Nunes and Costa, 2021).

Stranded assets are problematic because they are often illiquid investments and highly vulnerable to abrupt devaluations (Caldecott and others, 2016). Moreover, plans to reduce emissions to net-zero by 2050 mandate the inclusion of this type of risk in project feasibility calculations, to ensure that countries or firms recognize that they may not recover the fixed capital invested (IEA, 2022d). Depending on the country context, this may cause hesitation in short-term investments and even instability in the financial markets (Nunes and Costa, 2021).

Despite the dominance of renewables in electricity production in Latin America and the Caribbean, the amount of capital to be withdrawn prematurely from the energy sector over the next 30 years is estimated at between US\$ 37 billion and US\$ 90 billion, depending on the decarbonization pathway (Binsted and others, 2020). Under GHG emissions reduction scenarios that are consistent with limiting the global temperature rise to 2°C or 1.5°C by 2050, utilities in the region would have to prematurely shut down between 10% and 16%, respectively, of current fossil fuel-based electricity

generation capacity, or else reduce their production capacity (González-Mahecha and others, 2019). These high costs would fall on a relatively small group of agents, at a time when there is great need for new facilities and investments to expand production capacities (Caldecott and others, 2016; Binsted and others, 2020).

Stranded assets also have other consequences. Abandoned coal mines and oil wells not only pose physical risks to the surrounding communities by polluting water and air, but in the case of oil, they pose an additional risk through continuing methane emissions; and they also reduce the value of surrounding land (WRI, 2021). These are just some of the externalities caused by the oil and natural gas industry, on which the governments of the region have a duty not only to act, but also to inform their populations, as guaranteed by the Regional Agreement on Access to Information, Public Participation and Justice in Environmental Matters in Latin America and the Caribbean (Escazú Agreement) (ECLAC, 2023b).

The risk of stranded assets and the associated costs should therefore be taken into account in the decisions of large firms and investors in the hydrocarbon industry; but, above all, they should be incorporated into decision making by the region's governments. The latter must actively manage both the opportunities associated with hydrocarbon exploration and the risks imposed by the energy transition, including stranded assets. This will require implementation of an appropriate carbon price, the provision of tax incentives and the development of regulations on the energy efficiency of thermoelectric power plants, whether already installed or to be installed in the future. In addition, good corporate governance practices, such as the disclosure of non-financial information, should be made mandatory (Rozenberg, Vogt-Schilb and Hallegatte, 2017). While the design of appropriate policies will depend on each country and particular circumstance, it is an issue that needs to be taken into account in the agendas of the region's countries. Moreover, multilateral exchange mechanisms could be promoted, which could strengthen the countries' position vis-à-vis the sector's transnational firms.

2. Opportunities in an energy transition future: carbon dioxide capture and storage technologies

Key elements in the analysis of future investments in the non-renewable energies value chain, especially in the context of the energy transition, include carbon dioxide capture and storage and carbon capture, utilization and storage technologies.

As defined by the Intergovernmental Panel on Climate Change (IPCC, 2005), carbon dioxide capture and storage is a process that separates CO₂ from industrial emission sources, and stores and isolates it from the atmosphere over the long term. Carbon dioxide capture has been used for decades—in the production of ammonia from natural gas, and in the processing of natural gas itself as a by-product of oil exploration, among other uses; but its use as a viable way to mitigate GHG emissions, as well as its technological maturity and application on a commercial scale, remain a challenge (IEA 2021b; IPCC 2005). In contrast, carbon dioxide capture, utilization and storage technologies have been used to enable the captured carbon to be used in industrial processes, instead of just storing it. In addition to its use in other industries (for example, in the production of plastics, concrete and biofuels, among others), this modality has been used particularly in the oil and natural gas industry, especially with the development of enhanced oil recovery (EOR) projects.

Firms operating in the upstream hydrocarbon stage play an important role in this regard, since the large-scale use of carbon dioxide capture and storage technologies could be the only way to make their business model viable in the long term and also fulfil the climate commitments assumed.¹⁵

¹⁵ About 55% of the cumulative reductions in GHG emission obtained from technologies such as carbon dioxide capture, utilization and storage in the net zero scenario are based on technologies that are currently still being tested (IEA 2021b).

Moreover, these firms have vast technological and complex project management experience, as well as the resources needed to lead the development of the projects (BNamericas 2021). Nonetheless, the adoption of these technologies by large firms in the sector does not mean neglecting their core business; on the contrary, it would be a way to preserve it in the future (Lefebvre, 2023).

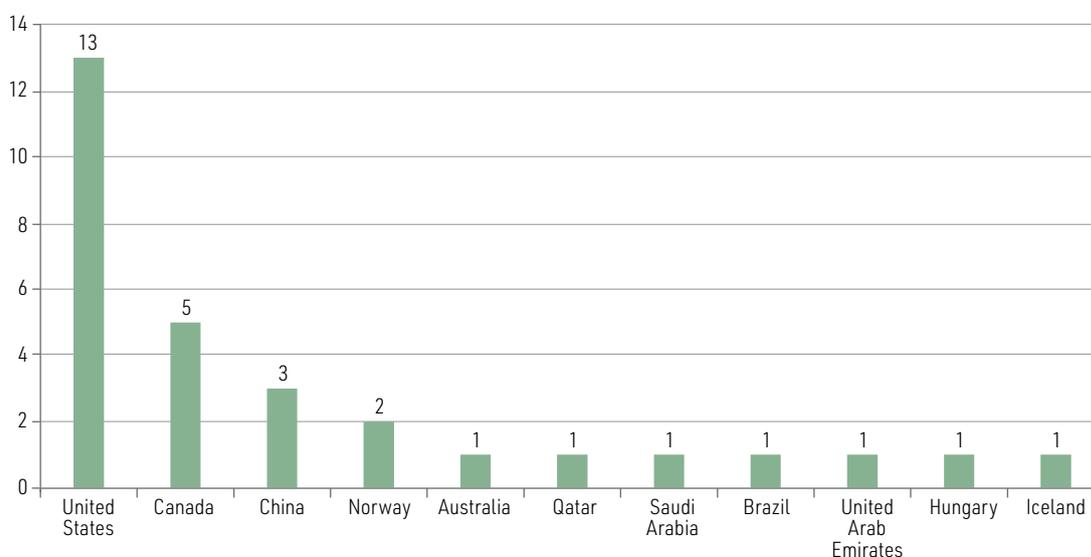
For Latin America and the Caribbean, carbon dioxide capture and storage technologies need to be considered in the context of the recent discoveries of oil and natural gas reserves. These have the potential for large volume extraction and production and, consequently, the inflow of investments and use of the revenues thus generated to reactivate the economy. However, despite their potential, Latin America and the Caribbean is one of the regions with the fewest installations for this purpose (Nunes and Costa, 2021).

According to Steyn and others (2022), in September 2022 there were 30 carbon dioxide capture and storage projects operating worldwide and 134 in the pipeline, mostly in the United States (43% of the total). This leadership will tend to increase in the coming years, owing to recent United States government tax incentives for the development of this type of technology. It is also worth noting that 58% of all carbon dioxide capture and storage projects involve geological storage (Steyn and others, 2022) (see figure II.23).

Figure II.23

Selected countries: operational carbon dioxide capture and storage projects, 2022

(Number of projects)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of M. Steyn and others (coords.), *Global Status of CCS 2022*, Global CCS Institute, 2022 [online] <https://www.globalccsinstitute.com/resources/global-status-of-ccs-2022>.

Although only six project announcements were directly related to these technologies in 2021 and 2022, the amount allocated to carbon dioxide capture and storage projects grew by 375% between the two years, totalling US\$ 3.454 billion in 2022. The United States accounted for 96% of the total, and Belgium 4%.

In the region, the only projected identified is the use of EOR by Brazil's Petrobras in 21 platforms producing oil extracted from the pre-salt layer of the Santos Basin, which is considered the largest carbon dioxide capture, utilization and storage project in the world (Agência Brasil, 2023; Steyn

and others, 2022; Petrobras, 2021).¹⁶ Since it was inaugurated in 2008, the Petrobras project has reinjected 40 million tons of CO₂; and the firm's goal is to reinject 40 million tons per year as from 2025 (Agência Brasil, 2023).

There are also projects in the planning and development phase in the region. Petrobras has recently disclosed plans to implement another carbon dioxide capture and storage technology, known as high-pressure membrane separation (HISEP), in its Libra projects by 2024, which will involve re-injection of CO₂ in subsea reservoirs (BNamericas, 2021).

A crucial issue for the development of projects related to this technology is the identification of geological zones with CO₂ storage capacity. It is also important that industrial-scale CO₂ emission sources exist relatively close to these areas, thus facilitating transportation and improving the feasibility of the projects. In Latin America and the Caribbean, several areas have been identified as suitable for large-scale use of this technology. In Trinidad and Tobago, for example, which is a country with growing hydrocarbon production, the main source of CO₂ emissions is in the Point Lisas region, which is relatively close to potential geological storage sites (Nunes and Costa, 2021).

Despite the potential for carbon dioxide capture and storage in the region, the technologies in question are still in the testing phase and have high implementation and operating costs. There are also regulatory and other uncertainties related to international carbon markets, which renders the return on investment even more unpredictable. Thus, in countries where the use of these technologies is more advanced, government support for the corresponding initiatives has proven fundamental; but this is still very incipient in the region. It would be essential to provide incentives to firms that invest in these technologies, especially in areas of new hydrocarbon discoveries, where transnational investor firms are more likely to adopt new technologies and modern extraction methods. However, the opportunity costs of these incentives must be weighed against other considerations and investment priorities of the region's limited resources in the face of the challenges posed by the energy transition.

The United States, Canada and many European countries have implemented tax incentives, regulations and other support measures to stimulate the development and implementation of carbon dioxide capture and storage technologies. Delay in adopting similar solutions in Latin America and the Caribbean would make the region less competitive in the race to develop “low-carbon oil”, in contrast to regions where these technologies are already mature and producing at scale.

In the context of the energy transition and new trends for firms to relocate according to the availability of green energy sources, countries and regions that can also offer environmental advantages in terms of oil supply could regain importance. Harmonized efforts are needed to seize this opportunity, first and foremost by forging appropriate national consensuses to promote green and inclusive growth (Arbache, 2022; Hausmann, 2021).

3. Generating value with hydrocarbons: opportunities to promote productive development

As mentioned in the previous sections, FDI inflows in the non-renewable energies sector are especially important for developing countries, since projects in the upstream stage of the oil, coal and natural gas value chain require large investments in resources and technology, which are seldom abundant in these countries. Moreover, owing to the high volatility of the prices of these commodities on international markets, the risk is high and the financing of these projects is often prohibitive for most

¹⁶ Enhanced oil recovery involves adding CO₂ to operating oil wells to increase reservoir pressure, thereby facilitating extraction and improving its mobility (McGlade, 2019).

developing countries without the presence of international capital. Moreover, the hydrocarbons sector has been historically important for Latin American and Caribbean countries, especially in terms of tax revenues and balance of payments (Titelman and others, 2023).

However, there is considerable debate as to whether the abundance of natural resources, such as hydrocarbons and energy minerals, is a “curse” or a “blessing” for developing countries. Several studies on the relationship between the presence of these resources in a country, and its economic development, find that the volatility of world prices for these raw materials also generates high volatility in per capita GDP growth in countries that rely on exporting them; and this undermines their long-term growth (Van der Ploeg and Poelhekke, 2009).

For example, when studying natural resource discoveries and their consequences, Corden and Neary (1982) note that large inflows of resources in the extractive sectors in natural-resource abundant countries can generate real exchange rate appreciation. This causes manufacturing, and the tradable sectors in general, to contract, while also fuelling inflation in the non-tradable sectors—a phenomenon known as “Dutch disease” (Benjamin, Devarajan, and Weiner, 2008; Corden and Neary, 1982).

Other studies, in contrast, show that the presence of abundant natural resources can be positive for a country, since the revenue obtained from their exploitation could make it possible to finance activities that are necessary for the country’s economic development. Based on data for Latin America and the Caribbean, Sánchez, di Domenico, and Tovar de la Fe (2019) found that an increase in the natural-resource share of total exports could be associated with a reduction in inequality in the countries in question. Other studies show how industrial growth, employment and income generation can benefit from commodity sector linkages (Morris, Kaplinsky, and Kaplan, 2012).

A common feature in several of these studies is the importance of the role of governments and institutions in promoting economic growth from natural resource-related sectors, especially by stimulating industrial growth in associated sectors. Sanchez, di Dominico and Tovar de la Fe (2019) note that the crux of the debate is not the natural resource endowment and its impact on a country’s economic development, but the way in which the resources are explored and exploited; in other words the institutional framework and governance. These authors also stress that institutional quality is crucial for exploiting the resource rent obtained from mineral exploitation.

In addition to institutional quality, some authors emphasize the soundness of the country’s financial system in exploiting the potential of the natural resource sector (Poelhekke and van der Ploeg, 2013; van der Ploeg and Poelhekke 2009). For example, a study by Satti and others (2014) on the hydrocarbons sector in the Bolivarian Republic of Venezuela, argues that the mere abundance of oil does not contribute to the country’s economic growth, but only when it is associated with financial development and openness to international trade. This underscores the importance of public policies to encourage sustainable exploitation of the country’s abundant natural resources, in conjunction with economic development policies (Satti and others, 2014). These policies should include regulatory and appropriate resource management measures, among others (Adedeji and others, 2016).

Governments can also design an industrial development strategy that uses the revenues obtained from the exploitation of natural resources to stimulate industrial activities at different levels of sophistication and at different points in the value chain, targeting the short, medium and long terms (Morris, Kaplinsky, and Kaplan, 2012). These authors identify a de-verticalization trend in the mineral resources exploration sector, which opens up opportunities for local firms to supply ancillary and intermediate goods and services, such as capital goods, chemical inputs, and knowledge-based services. Industries related to hydrocarbon exploration have location-specific attributes, which means that they must operate locally. This opens up possibilities for harnessing and making use of local knowledge, including local capacity to provide basic services, such as food, transportation and housing, and is a platform for generating technological spillover effects.

One way to encourage the creation of linkages with the local economy would be through local-content policies. Whatever the legal framework for granting oil, coal or natural gas exploration rights to foreign firms, the inclusion of clauses requiring a local counterpart can contribute to industrial development in the country, whether or not it is related to the value chain of the resource being exploited. Such requirements include technology transfer to local firms, the hiring and training of nationals from the destination country of the investment, or the purchase of local goods and services, among other obligations (Tordo and others, 2013). A study for Nigeria suggests that the national content requirement system enhances local value creation through the development of backward linkages and the participation of local firms in the value chain. The commitments required by this system include the development of Nigerian expertise relating to the planned operations, as well as local training and employment obligations included in oil contracts, for example).¹⁷ This has had a positive effect on local value creation through the development of backward linkages and participation by local firms in the value chain. Thus, the policy has been found to have a positive effect on job creation (Adedeji and others, 2016; Tordo and others, 2013).

Nonetheless, despite the relative abundance of formats and designs of these instruments, and their application, their success depends on the context of the country in which they are adopted, and also on the other productive development policies implemented by the government. Brazil, for example, reduced the domestic content requirement from 40% to 20% in different licensing rounds for oil and gas exploration in the country, owing to concerns about the impact on investment costs and exploration and field development schedules (Tordo and others, 2013).

Other authors also highlight the need to add value to the country's mineral resources, instead of just exporting them without any processing. According to Nagaeva (2021), this would avoid having to import technology and more sophisticated goods and services, with local firms being relegated to supplying low value-added products and services, which would reduce the potential for technology transfer. It would therefore be worthwhile fostering collaboration between international capital and local firms, especially small and medium-sized enterprises (SMEs). An example would be to promote investments not only in the oil extraction and production phases, but also in refining and processing activities, which would increase jobs, boost wages and stimulate other related industries (Nagaeva, 2021).

This hypothesis is supported by empirical evidence: although investments are larger per project in the 'downstream segments of the petroleum value chain, when analysing data on job creation by the oil and gas production and transportation cluster in the United States in 2020, the largest number of jobs were created in activities supporting oil and gas operations. These accounted for 43% of the total, with oil and gas exploration being only the second sector (18%) (U.S. Cluster Mapping, 2020).

Cluster initiatives thus represent an important tool that governments can use to diversify and enhance the sophistication of their productive apparatus in different activities, such as in value chains unrelated to non-renewable energies, thereby promoting economic diversification and reducing reliance on extractive activities. Such initiatives can be financed through resources obtained from hydrocarbon exploration and production activities. In Argentina, for example, firms have been reorganized to take advantage of the opportunities arising from hydrocarbon exploration in Vaca Muerta. Small and medium-sized enterprises (SMEs) producing auto parts in the province of Córdoba have adapted and diversified to serve the sector; and the Mar del Plata energy cluster has mobilized resources to connect to Vaca Muerta through pipelines (attracting investments worth US\$ 40 billion from the Malaysian oil company Petronas), with a view to increasing its liquefied gas export capacity (Lanzafame, 2022, MásEnergía, 2022).

¹⁷ The Nigerian Oil and Gas Industry Content Development Act, approved in 2010, sought to enhance the capacities of local firms and create more business opportunities for them. The law set targets to boost the development of local content, starting at 45% in 2007, rising to 70% in 2010 and eventually exceeding 80% by 2020. This policy was intended to foster the growth and development of the domestic oil and gas industry in Nigeria (Adedeji and others 2016).

Another way to address the challenges and opportunities arising from the bonanza of mineral resources such as oil, coal and natural gas would be to develop a taxation framework that includes solutions such as the creation of sovereign wealth funds. The advantage of this instrument would be to use revenues from resource exploitation activities to promote not just distributive, but also intergenerational justice (Machado e Silva and Medeiros Costa, 2019). Sovereign wealth funds could thus be used to transform non-renewable natural capital into other forms of durable capital, in order to promote sustainable development (Hazin and Sotelsek Salem, 2019). In addition to establishing long-term savings and promoting economic and social development, sovereign wealth funds would also help stabilize revenues in the short term. However, the effectiveness and transparency of these funds depend on how they are structured, and on their objectives and corporate governance. The industry benchmark in this regard would be the world's largest sovereign wealth fund, the government's Pension Fund-Global (GPF), created by Norway in 1990,¹⁸ This fund receives all net revenues from oil exploration in Norway, plus the return on the investment of these resources, minus the total amount transferred to the country's fiscal budget (Machado e Silva and Medeiros Costa, 2019).

Norway and its sovereign wealth fund are examples of the revenues obtained from hydrocarbon exploration being used to diversify the economy, by nurturing the development of sectors unrelated to non-renewable natural resources. Before GPF was created, Norway set up a fund that invested exclusively in its domestic market, providing large sums for the development of other industries and job creation (de Rosa and Bartsch, 2016). This has contributed to the fact that the country currently ranks thirty-eighth (out of 131 countries) in the economic complexity ranking of the Observatory of Economic Complexity (OEC), despite the fact that its exports are still dominated by hydrocarbons (OEC, 2022a). Another example is Malaysia which, thanks to an industrial policy based on developing products with higher technological content and the promotion of skill upgrading policies, succeeded in concentrating 35.6% of its exports in the electrical equipment sector (Gelb, 2010; OEC, 2022a).

Despite the multiplicity of existing instruments and their applicability to different realities, governments need to adopt strategies to ensure that non-renewable energy exploration and production activities are converted into lasting benefits for society at large. This is especially crucial in the context of the energy transition, where the objective is to make these sources obsolete and no longer exploit them. Governments should therefore play an active role in maximizing the benefits that can be extracted from the hydrocarbon industry in the short term, while the resources in question remain necessary for energy security during the transition to a predominantly clean and renewable energy matrix.¹⁹

E. Conclusions

The global energy panorama is in one of its most challenging phases. Following a period of economic slowdown and the consequent sharp decline in energy demand and prices during the COVID-19 pandemic, global energy demand has increased substantially in recent years. However, the conflict in Ukraine, compounded by climatic and geopolitical factors, has fuelled uncertainty in global energy supply, which is increasingly considered a strategic resource. Moreover, concerted actions recently

¹⁸ In 1990, the Norwegian Parliament adopted the law that created the "Government Petroleum Fund" (NBIM, n.d.). In 2005, the name was changed to "Government Pension Fund Global" (Machado e Silva and Medeiros Costa 2019).

¹⁹ In this context, it is important to note the existence, in Latin America and the Caribbean, of the Regional Technical Forum of Energy Planners (FOREPLEN). This forum serves as a permanent cooperation mechanism, seeking to bring together teams and entities involved in energy planning in Latin America. Its purpose is to generate, jointly and with a long-term vision, the knowledge needed to plan sustainable, safe and affordable energy systems, in order to promote complementarity in the energy transition in the region. The main objective of the forum is thus to create a platform for technical exchange to strengthen cooperation between countries on regional energy planning issues (ECLAC n.d.).

taken by the world's major oil and natural gas producers have driven up the prices of these energy inputs. Given the high degree of global dependence on non-renewable energy sources, investment in hydrocarbons remains very attractive in the short term.

For Latin America and the Caribbean, this increased demand for energy is likely to be positive news for hydrocarbon-exporting countries, especially in the context of the recent discoveries of new reserves and the interest they have aroused among international investors. Although M&A flows in the sector have been trending down since 2019, project announcements increased by 707% in the last year alone. This increase has been driven mainly by projects related to oil and natural gas prospecting, exploration and production. It is notable that investments in the upstream stage of the hydrocarbon value chain are often the starting point from which transnational firms roll out their strategies in Latin America and the Caribbean. These investments define their interest in the expansion of existing projects, other similar ventures or other stages of the value chain that promote the processing and distribution of the extracted hydrocarbons.

The rents associated with the exploitation of these resources represent a promise and also a hope for several governments in the region, especially after years of economic growth at rates below those needed to achieve the Sustainable Development Goals, compounded by scant fiscal space and a significant external constraint. However, they also provide opportunities for creating jobs and adding value, whether in the hydrocarbon industry itself (refineries, petrochemicals, etc.), or in the industries supplying the inputs and services needed to develop large projects in the countries of the region, or even in economic activities that are unrelated to the exploitation of non-renewable resources.

However, this growing demand for hydrocarbons, and promises of future investments in the exploration, extraction and production of oil and natural gas do not seem to be compatible with the urgent need to mitigate the effects of climate change. The energy transition requires the exploitation of new hydrocarbon reserves to be halted and the use of fossil fuels to be phased out in the coming years, while increasing investments in clean and renewable energies. This situation makes hydrocarbon investments riskier, more costly and less viable. For Latin America and the Caribbean, this could lead not only to the underutilization of existing resources, which are a major source of income and employment in the region, but also to a large amount of capital being lost prematurely by becoming stranded assets.

Increased investment notwithstanding, clean and renewable energy sources have yet to attain the scale necessary for a successful and secure energy transition. Moreover, despite having made commitments to the energy transition, large international and national companies in the oil, coal and natural gas sector have acted timidly in changing their business model. In fact, they have increased their investments in the carbon-intensive sector, especially after reporting record earnings in 2022.

This scenario gives the region's governments an even more important role. Firstly, they are responsible for defining the regime under which non-renewable resources will be exploited, especially those related to new discoveries; along with their depletion policy and how the revenues from the activity will be used to the benefit of society. They must also play an active role in defining how these resources will be maximized, either by promoting economic activities in other stages of the hydrocarbon value chain, or beyond, by fostering the productive development of other sectors. In addition, they have a role in evaluating the feasibility of providing incentives for the large-scale adoption of technologies such as carbon capture and storage and carbon capture, utilization and storage, which are essential for the future of the hydrocarbons industry.

Secondly, governments must be the lead actors in coordinating strategies to achieve a successful energy transition in the region. They are responsible for making sure that non-renewable energy activities are reduced radically, as required by the climate commitments, while managing to mitigate their negative effects and their economic and social costs, especially in terms of investments, employment and income. One of their central functions is to develop long-term policies that promote investments

in renewable energy sources, so that the transition is rapid and secure, and does not leave the region lagging behind in a context in which energy from clean sources is a factor of competition. However, another of their functions is to ensure that this transition enables their productive apparatus to become more sophisticated and diversified in sectors unrelated to extractive activities, while at the same time not jeopardizing the energy security of their populations. International cooperation also has a key role, as a source of both guidelines and know-how, and resources and technologies that make a just energy transition possible.

This chapter has explained the importance of non-renewable energy sources in the context of the energy transition, providing an overview of investments in the sector, with a focus on Latin America and the Caribbean. It also identified the challenges and opportunities facing the region in this context, highlighting the role of governments in managing the exploitation of non-renewable energy sources during the energy transition. To complete the regional overview of the energy transition, the challenges and opportunities of renewable energy sources will be discussed in chapter III.

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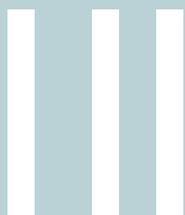
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CHAPTER



Foreign direct investment in renewable energies: strategies to advance the energy transition in Latin America and the Caribbean

Introduction

- A. The importance of renewable energy investment for the energy transition and attainment of the Sustainable Development Goals
- B. Global trends in renewable energy foreign direct investment
- C. Opportunities for the development of renewable energies in Latin America and the Caribbean
- D. Renewable energy foreign direct investment in the region: dominated by two technologies in three countries
- E. Policy approaches for promoting renewable energy and attracting foreign direct investment
- F. Conclusions

Bibliography

Introduction

Renewable energies have been one of the main drivers of international investment. In 2005, foreign investment announcements in this area accounted for only 6% of total energy-related foreign investment announcements worldwide by value; in 2022, they accounted for 80%.

Several factors have driven the growth in renewable energy investment, from climate change and the need to comply with international climate agreements to rising energy demand and falling prices for renewable generation technologies.

Since the COVID-19 pandemic and the conflict in Ukraine, the energy transition has become a strategic priority for the world's largest economies and has been increasingly linked to production development and energy security policies.¹ The European Union and the United States have adopted and committed substantial resources to plans to accelerate the energy transition and strengthen production capabilities in related sectors, while China's latest five-year plan includes a target for decarbonizing the country.

International climate commitments, the growing need for energy security and the role of energy in enabling sustainable growth all mean that the global use of renewable energies can be expected to increase. While investment in the sector has consistently risen, the International Renewable Energy Agency (IRENA) estimates that some US\$ 131 trillion needs to be invested by 2050 if the goal of limiting the average rise in global temperature to 1.5 °C is to be met (IRENA, 2021). For this investment to occur, ambitious national and regional strategies will have to be implemented so that resources for the energy transition are mobilized.

The countries of Latin America and the Caribbean are very well positioned to take advantage of this transition, since they have well-developed energy markets and great potential in terms of their endowment of renewable energy resources. The region's countries have progressively greened their electricity generation mix in recent decades, so that it is now among the world's cleanest. However, renewable generation has been dominated by the large installed hydroelectric capacity in those countries. The effects of climate change and alterations in rainfall intensity are increasing the vulnerability of water sources, requiring renewable energy generation sources to be diversified beyond hydropower (IEA, 2021a). Expansion of the capacity of other technologies, in particular solar and wind power, represents a major opportunity to accelerate the region's energy transition and diversify its energy mix.

The region's markets have attracted the interest of international investors and become globally strategic. Between 2005 and 2022, they were the destination for more than 500 renewable energy foreign direct investment (FDI) project announcements worth a total of almost US\$ 170 billion. The most attractive markets were Brazil, Chile and Mexico, which accounted for more than 80% of all announcements in the region. Solar and wind energy were the main technologies, representing almost 70% of all investment projects.

While most countries have set medium-term goals and the region has made substantial progress in developing the sector, energy demand is projected to increase significantly in the coming years, requiring the mobilization of public and private resources. In the current context, characterized by inadequate growth and limited fiscal policy space, there is a need to implement medium- and long-term strategies to facilitate the energy transition and enable its capacity-building potential to be harnessed. ECLAC (2023) has identified the energy transition as a priority area of action for the region's recovery strategies. A clean energy supply will be essential for it to move towards more sustainable models of development. Clean energy can become a competitive factor as the region seeks to develop new production sectors and attract investment in other sectors apart from renewable

¹ In the literature, production development policies are also referred to as industrial policies.

energies. It is therefore necessary to set energy transition strategies within the framework of energy and production development policies by designing toolkits calibrated to the needs and capabilities of the countries that serve to strengthen the renewable energy sector and develop capabilities right along the chain and in related sectors. In this context, FDI can play a key role in technology transfer and capacity-building.

This chapter presents a brief analysis of the renewable energy sector and its FDI trends globally and in Latin America and the Caribbean. It also provides a detailed analysis of the dynamics of investment in solar and wind technologies, given that, unlike hydropower or biofuel, these sources were the main drivers of FDI in the region and the world during the period under review. At the end of the chapter, some of the main policy mechanisms that can be used to attract FDI and their potential impact on strategies to promote this type of investment in the countries of Latin America and the Caribbean are analysed.

A. The importance of renewable energy investment for the energy transition and attainment of the Sustainable Development Goals

The energy sector is currently the largest contributor to global greenhouse gas emissions. Oil, gas and other fossil fuels generate more than 75% of these and almost 90% of carbon dioxide emissions (UNEP, 2020a). To avoid climate change worsening and to meet the Paris Agreement goals, a 50% reduction in the overall emissions of the energy sector is required by 2030, on the way to net zero by 2050 (UNEP, 2020a). Achieving these targets requires an urgent energy transition to renewable energy sources and the implementation of strategies to decarbonize the energy sector.

The objectives for the energy sector by 2030 have been established in the targets of SDG 7, which concerns access to affordable, secure, sustainable and modern energy for all. These targets are as follows:

- 7.1 Ensure access to affordable, reliable, sustainable and modern energy for all.
- 7.2 Increase substantially the share of renewable energy in the global energy mix.
- 7.3 Double the global rate of improvement in energy efficiency.

Achieving SDG 7 is critical to delivering the 2030 Agenda for Sustainable Development and the other SDGs. Sustainable and inclusive economic growth will depend heavily on the transition to renewable energies, which are essential for enhancing energy productivity and security in developing countries and transitioning the global economy towards less polluting sectors. Moreover, the energy transition will not only bring climate benefits. In its report on the pathway to net zero, the International Energy Agency (IEA) estimates that renewable energies will be essential to achieve climate goals, generate quality jobs and sustain economic growth (IEA, 2021b). Similarly, IRENA (2021) estimates that attaining 8,000 GW of installed renewable energy capacity could contribute significantly to achieving the 2030 Agenda goals. In particular, the transition would boost global GDP by an average of 1.3 percentage points per year by 2030. In addition, at least 25 new jobs are created for every million dollars of investment in renewable energies (IRENA, 2020).

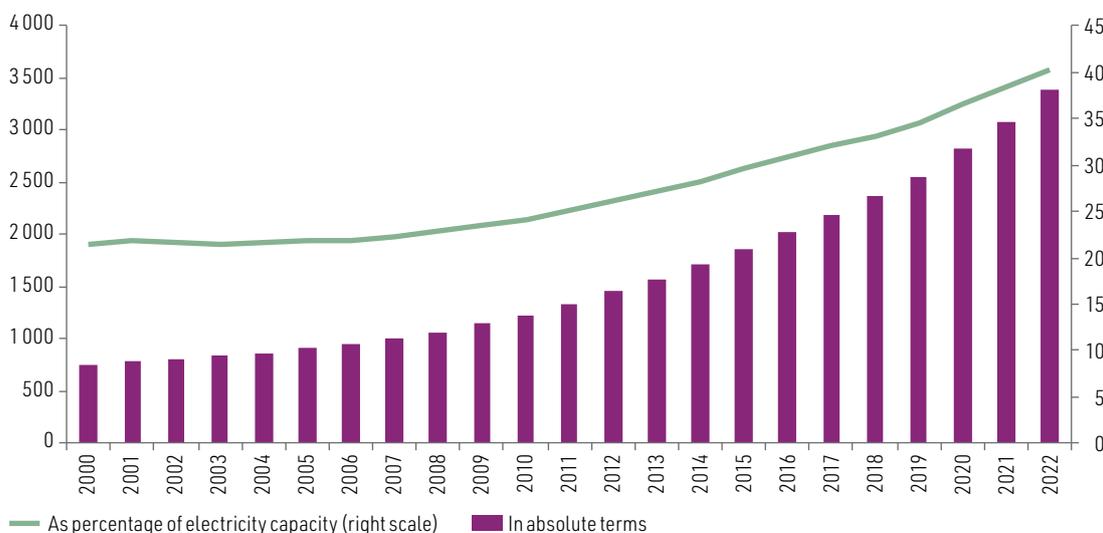
The electricity sector will be the main driver of the energy transition. In 2021, the sector was responsible for 36% of total energy-related emissions, and IEA estimates that global electricity output will need to increase by 3.2% per year to 60,000 TWh by 2050 for climate targets to be met. Some 75% of the increase in global electricity demand will be in developing countries, whose electricity

needs will grow 50% by 2030; from the sectoral point of view, the main drivers of this demand will be industry, transport systems and green hydrogen generation. The roll-out of renewables in all regions of the world will be essential to decarbonize the electricity sector and contribute to climate goals; in particular, almost 90% of electricity will have to be generated from renewable sources by 2050, with wind and solar power accounting for 70% of all the electricity produced in the world (IEA, 2021b).

In this scenario, investments to decarbonize the electricity and energy sector will be crucial to the transition. Over the last 20 years, policy initiatives to drive forward the energy transition have played an important role in redirecting investment towards renewable technologies. New capacity employing renewable technology has outstripped new non-renewable capacity since 2012: in 2022, the former accounted for 83% of all new installed capacity (IRENA, 2023). Globally, however, the energy mix is still dominated by non-renewables, which account for 60% of installed generating capacity (see figure III.1). Also, while installed renewable energy capacity is now 40% of total installed capacity globally, there are large disparities between regions. Asia accounts for 48% of total installed renewable energy capacity, followed by Europe with 21% and North America with 15%. The Latin American and Caribbean countries are home to just over 8% of this capacity and Africa and the Middle East to 2% (IRENA, 2023).

Figure III.1

Installed renewable energy capacity worldwide, in absolute terms and as a proportion of electricity capacity, 2000–2022
(Gigawatts and percentages)

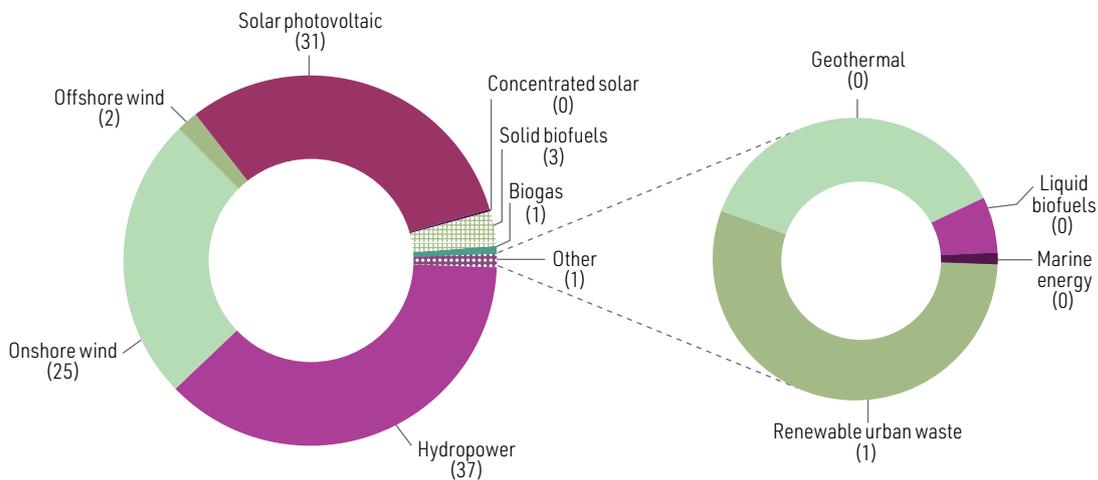


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Renewable Energy Agency (IRENA), *Renewable Capacity Statistics 2023*, Abu Dhabi, 2023.

At the end of 2022, global installed renewable energy capacity was 3,372 GW. Hydropower was the largest contributor, with 37% of the total, followed by solar and wind energy, with 31% and 27%, respectively. Other renewables together accounted for 5% of total installed capacity (see figure III.2).

Solar and wind technologies have been the fastest-growing, contributing 12% of all electricity generated in 2022. The spread of these technologies has been due to technological advances and the fact that electricity costs less when generated from them. The current cost per kilowatt hour of electricity obtained from wind and photovoltaic solar sources is lower than that of electricity from coal-fired and, to a lesser extent, gas-fired plants (Lazard, 2021).

Figure III.2
Installed renewable energy capacity worldwide, by technology, 2022
(Percentages of the total)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Renewable Energy Agency (IRENA), *Renewable Capacity Statistics 2023*, Abu Dhabi, 2023.

The COVID-19 crisis and the conflict in Ukraine have resulted in a period of turbulence in energy markets and put energy agendas at the core of developed countries' recovery strategies (see box III.1). The European Union has launched a package of policies to increase the energy security of European countries by promoting the roll-out of renewable energies. In particular, the REPowerEU plan aims to hasten the green transition by accelerating the energy transition and capacity-building in related sectors. The European Commission has designed a 210 billion euro investment package for the development of renewable energies, among them solar and wind energy; it has also designed strategies to strengthen renewable technology manufacturing capabilities and plans to invest 27 billion euros in the development of green hydrogen infrastructure. The strategy of the United States for responding to the crisis caused by rising inflation, meanwhile, has focused on facilitating the energy transition and the development of related technologies. To this end, a set of measures, including a package of tax incentives, has been adopted with the aim of boosting the development of the renewable energy industry. For its part, in June 2022, China unveiled its fourteenth five-year plan for renewable energy development, aimed at mobilizing the public and private sectors to double renewables-based energy generation by 2025 and fostering the development of related sectors and technologies.

Box III.1

European Union and United States: investments and production development strategies to accelerate the energy transition

In August 2022, the United States passed the Inflation Reduction Act with the aim of accelerating the energy transition and achieving a 40% reduction in greenhouse gas emissions by 2030. The Act is the most ambitious energy law in the country's history and provides for federal investments worth nearly US\$ 400 billion over the next 10 years. The planned investments range from incentives for the development of renewable technologies to tax breaks for energy efficiency in buildings and the purchase of electric vehicles.

Energy sector measures account for some 63% of the total funding envisaged by the Act, followed by measures to promote the development of manufacturing industry in the country, accounting for 12%. Renewables, and in particular wind and solar energy, are the drivers of the strategy. The Act includes

a package of more than US\$ 60 billion for the onshoring of manufacturing activities in the renewable energy and transport value chains in the United States. In particular, the following extra funding is provided for:

- US\$ 30 billion in tax credits for solar panel, wind turbine and battery production and critical mineral processing
- US\$ 10 billion for the construction of manufacturing plants
- US\$ 500 million in the Defense Production Act for critical minerals processing and heat pumps
- US\$ 2 billion in subsidies to refurbish automotive manufacturing plants for electric vehicle production, ensuring continuity for workers
- US\$ 2 billion for the country's research and development laboratories to accelerate research into energy technologies

The Inflation Reduction Act also provides for investments to decarbonize the economy and incentives to reduce emissions in all sectors. The package consists of: tax credits for renewable electricity generation and storage; US\$ 30 billion in subsidies for energy sector companies; tax credits and subsidies for clean fuels; subsidies and tax credits to reduce emissions from industry, including US\$ 6 billion to reduce emissions in energy-intensive industries and US\$ 9 billion for public procurement of clean technologies; and US\$ 27 billion to accelerate the take-up of clean technologies in disadvantaged communities. In parallel, the Act includes measures to reduce the cost of energy for consumers and stimulate demand for clean technologies. These measures include 10 years of tax credits to boost the energy efficiency of buildings and encourage the installation of photovoltaic panels on roofs and the purchase of electric vehicles. Lastly, the Inflation Reduction Act includes measures for the energy transition in agriculture and US\$ 60 billion for environmental justice.

The European Union, for its part, responded to the COVID-19 crisis by presenting a plan to become the first decarbonized continent. This plan, the European Green Deal, aims to achieve zero net greenhouse gas emissions by 2050 and decouple economic growth from pollution and natural resource use. The Green Deal includes a set of European laws and initiatives to accelerate the energy transition and promote the development of clean technologies. It will be funded from the European Union budget and one third of the resources earmarked for NextGenerationEU, the recovery instrument designed to address the emergency phase of the COVID-19 crisis. The European Commission aims to mobilize a trillion euros in sustainable investments over the next 10 years in order to achieve a 55% reduction (from 1990 levels) in greenhouse gas emissions, increase the share of renewables by 32% and improve energy efficiency by 32.5%, all by 2030. The European Green Deal aims to strengthen the position of the European Union in the value chains of sectors connected with the energy transition and seeks to develop manufacturing industry, accelerate innovation with a view to green hydrogen production, promote the electrification of transport and improve the energy efficiency of buildings, among other initiatives.

On 18 May 2022, in response to the crisis caused by the conflict in Ukraine, the European Commission presented a plan to accelerate the energy transition of European countries and reduce dependence on energy imports from the Russian Federation. The objective of this plan, labelled REPowerEU, is to diversify the European Union's energy mix and achieve 40% renewables penetration by 2030. The plan envisages additional investment of 210 billion euros by 2027 and 225 billion euros in lending. Among other measures, the strategy provides for an increase in installed solar panel capacity from 189 GW to 320 GW by 2025 and to 600 GW by 2030, an initiative to incentivize the installation of photovoltaic panels on the roofs of buildings, an initiative to produce 10 million tons of green hydrogen by 2030 and a plan for the development of the biomethane industry. To accelerate the transition, the European Union increased its research and development spending by 5%, earmarking an extra 200 million euros of funding for research and development in green hydrogen-related areas.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Government of the United States, *Building a Clean Energy Economy: A Guidebook to the Inflation Reduction Act's Investments in Clean Energy and Climate Action*, Washington, D.C., 2023 [online] <https://www.whitehouse.gov/wp-content/uploads/2022/12/Inflation-Reduction-Act-Guidebook.pdf>; European Commission, "Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: the European Green Deal", 2019 [online] <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM%3A2019%3A640%3AFIN>; European Commission, "Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: REPowerEU Plan", 2022 [online] <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A230%3AFIN&qid=1653033742483>.

For developing countries, the transformation of the energy sector presents major challenges. In developed countries, with their mature production structures, the energy transition involves changing the energy mix that underpins growth in the economy and harnessing new technologies to generate new sources of growth. The challenge for developing countries is twofold, since they have to make production structures more sophisticated while promoting the adoption of low-carbon energy. However, the energy transition can represent an opportunity for these countries' development strategies, since clean and cheaper energy sources can enhance energy security, increase the energy productivity of existing sectors, facilitate the development of energy-intensive activities and generate quality jobs (Batini and others, 2021).

While the transition will occur at different speeds in different regions, it is imperative to ensure that technological capabilities in renewable energy-related sectors are not concentrated in a few countries. It is therefore essential to implement strategies and policies that promote the deployment of renewable energy in developing countries and ensure that these can appropriate the socioeconomic benefits associated with the transition. Energy policies for renewable energy deployment must operate in tandem with production development policies, which are essential to foster capacity-building right along the renewable energy value chain and a shift in production structures towards sectors that sustain green energy industries. Countries with fewer capabilities will need more technological and financial support. Accordingly, directing investment efforts towards developing countries will be crucial for a just energy transition that leaves no one behind (United Nations, 2021).

1. The organization of renewable energy value chains: a sector in which technology production is highly concentrated

The renewable energy sector can be defined as the set of activities, processes, operations and organizations involved in the generation and distribution of energy from renewable sources. Like most sectors, the renewable energy sector is organized around global value chains with different stages, from the development of energy generation technologies to the distribution of energy in the market.

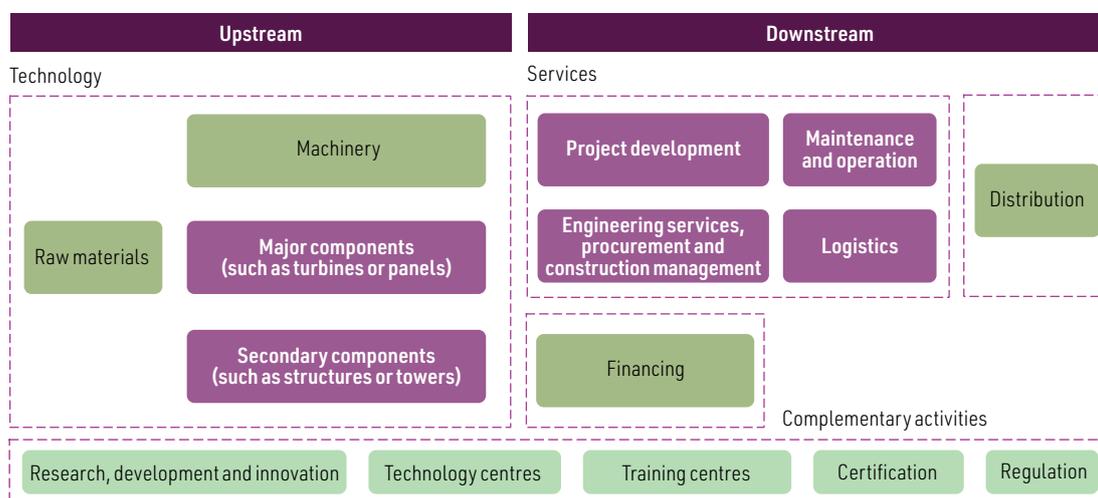
Because different technological processes are used to transform the various natural sources into energy, the sector's organization is specific to each of the generating technologies. However, it is possible to stylize some of the main stages in renewable energy value chains (see diagram III.1). The chain can be simplified into two stages. The first, upstream stage consists of all the processes involved in producing the technologies used to transform natural resources into energy, including obtaining raw materials for the development of the technologies for producing and distributing energy. The second, downstream stage consists in the activities of project planning and design, financing, deployment of technology, operation and maintenance and, lastly, production and distribution of energy in the grid. Alongside the value chain, there is a set of complementary activities that include research and development (R&D) and the regulation of energy markets.

Broadly speaking, the time it takes to implement a renewable energy project depends on the technology, the scale of the project and the country concerned. The whole chain can be divided into three phases: predevelopment, which comprises project assessment, feasibility studies and cost estimation; development, which consists in project construction, installation of the technology and commissioning; and operation and maintenance.² Depending on the technology, the scale of the project and the regulatory environment, a project can take between 2 and 12 years to become operational (Ebenhoch and others, 2015; Lee and Jin, 2015).

² The wind energy value chain, for example, involves turbine manufacturing companies and suppliers of ancillary components such as nacelles, blades, generators, converters, gearboxes, bearing systems and control equipment. The chain also involves suppliers of engineering and construction services, raw materials (iron, aluminium, copper, steel and fibreglass) and machinery and a variety of services at the project design and planning stage, such as site selection, site studies to assess wind characteristics and strength, power grid studies and assembly, operation and maintenance services. Lastly, power distribution companies are also part of the chain.

Diagram III.1

Renewable energies: stylized value chain of the sector



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of J. Huenteler, C. Niebuhr and T. S. Schmidt, "The effect of local and global learning on the cost of renewable energy in developing countries", *Journal of Cleaner Production*, vol. 128, August 2016; and T. Matsuo and T. S. Schmidt, "Managing tradeoffs in green industrial policies: the role of renewable energy policy design", *World Development*, vol. 122, October 2019.

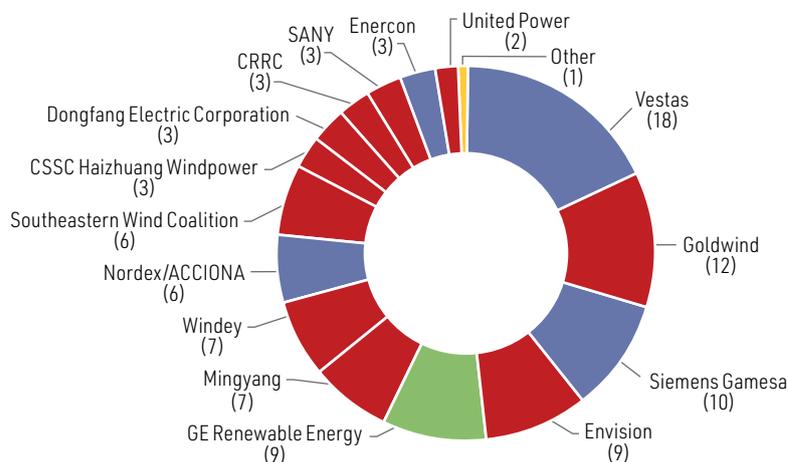
Renewable sources are generally less geographically concentrated than fossil fuels, which has resulted in highly globalized value chains involving transnational companies that operate worldwide. Companies participate in the various segments of the chain and specialize in one or more renewable technologies. Over the last 20 years, market expansion has led to a pattern of competition based on cost and technological excellence. As these dynamics have intensified, companies' levels of consolidation and vertical integration have increased (Lacal-Aránzategui, 2019; Meckling and Hughes, 2017). This has led to varying levels of concentration in critical stages of chains and, particularly, in the development of individual renewable technologies, giving rise to a growing market for service and component suppliers.

For example, in recent years, the development of wind and photovoltaic solar power generation technologies has become concentrated among a few companies capable of providing efficient technologies at competitive costs. In the case of wind energy, 15 manufacturers have the capacity to meet about 40% of the global demand for turbines and 45% of the demand for blades (GWEC, 2022). The increasing pressures of competition in the market and the requirements of scale and technological development led to the number of turbine producers declining by more than 50% between 2013 and 2021. In 2021, 30 producers installed more than 29,000 wind turbines worldwide. Asia and the Pacific and Europe dominate the market, with shares of 60% and 30%, respectively. Figure III.3 shows the main wind turbine producers and their market share in 2021.

In the case of photovoltaic panels, more than 24,000 modules were produced in 2021, with global production heavily concentrated in China, which is responsible for 75%, followed by Viet Nam (6.8%) and, with smaller shares, Malaysia, the Republic of Korea, the United States and India (see figure III.4). China dominates almost all segments of the photovoltaic panel and module value chain. In all countries except China, demand for photovoltaic solar power exceeds production capacity. While the countries of North America and Europe have substantial module manufacturing capabilities, 90% of the solar cells used are manufactured in Asia, particularly South-East Asia (IEA, 2022b). China's solar module and component production remains the most competitive in the world, with manufacturing costs 10% lower than in India, 20% lower than in the United States and 35% lower than in Europe (IEA, 2022b).

Figure III.3

Leading producers of wind turbines worldwide, 2021
(Percentages)

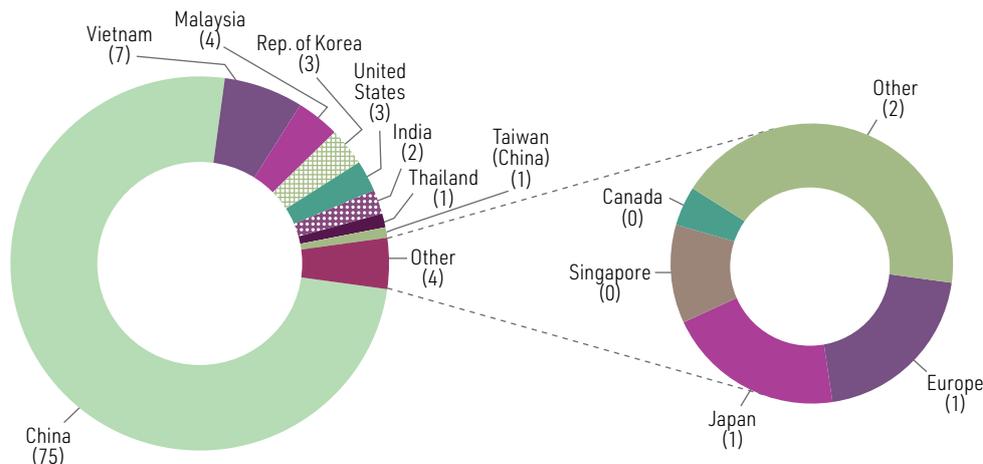


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Global Wind Energy Council (GWEC), *Global Wind Report 2022*, Brussels, 2022.

Note: The colours indicate the country of origin of the company: red for China, blue for Europe, green for the United States and yellow for the rest of the world.

Figure III.4

Leading solar panel-producing countries, 2021
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Photovoltaic Power Systems Programme (PVPS), *Trends in Photovoltaic Applications 2022*, Paris, 2022.

Meeting climate and energy targets in the coming years will require a more than fourfold increase in renewable technology development and production capacity (IEA, 2023a). One of the main barriers for developing countries remains the technology intensity of projects. The initial capital cost is a major part of the life cycle costs of renewable energy projects and, in general, renewables are much more sensitive to increases in initial financing costs (Schmidt, 2014). In Germany, for example, the capital cost involved in photovoltaic power generation has been accounting for between 12% and

37% of the levelized cost of electricity (Egli, Steffen and Schmidt, 2018). In developing countries such as Brazil and India, the capital cost can represent as much as 50% of the total cost of photovoltaic solar generation (Schmidt, 2014). In recent decades, public policies have been essential to mitigate project development costs and increase the viability of renewable energy technologies. Governments have funded renewable energy support schemes through national strategies, subsidies, grants, feed-in tariffs and regulated payment systems or power purchase agreements (PPAs). These last, in particular, have been the main method of compensating for the risks involved in developing renewable technology projects.

Developing the capabilities to diversify production chains and reduce the capital costs of renewables will be essential to meet future technology demand and make the energy transition possible. Some markets with substantial domestic demand, such as India, the United States, Europe and Brazil, are forming a critical mass at the technology development stage. Production costs, human capital availability and logistics infrastructure remain critical for achieving economies of scale to compete in the global market. India, for example, has managed to position itself as an important player in secondary component production and technology assembly. Brazil, similarly, has become the world's fifth-largest manufacturing hub in the wind sector after China, Europe, India and the United States. In most countries where renewable energy technology production and export capacity have been developed, value has been generated locally by developing a highly skilled workforce, not only in technology design and engineering but in all activities along the value chain, from R&D to installation and operation and maintenance services.

While global renewable technology chains have consolidated in terms of cost efficiency, they remain exposed to major challenges. Growing demand for renewable technologies, competition for critical minerals and the new policy packages implemented in developed countries to strengthen local capabilities have the potential to reshape the geography of renewable technologies over the coming years. Long-term policy frameworks to mobilize local capacity-building investments will become increasingly necessary as a way of mitigating supply chain risks and making the green transition possible.

2. The mobilization of different funding sources in developing countries for the energy transition

The policy strategies implemented in response to the various recent crises have been aimed primarily at accelerating the green transition and have underpinned investment. In 2022, investment for the green transition totalled US\$ 1.1 trillion, an increase of 31% over 2021. China was the main driver of the increase, with investments of US\$ 546 billion, followed by the European Union with US\$ 180 billion and the United States with US\$ 141 billion. In total, the three powers were responsible for almost 80% of global investment. Renewables accounted for 45% of this investment (US\$ 495 billion), followed by electric transport with 42% (BloombergNEF, 2023).

Between 2013 and 2022, renewable energy investment grew by an average of 8.5% annually, led by solar and wind power, which accounted for 97% of the total in the latter year (see figure III.5).

Over 40% of renewable energy investment went to South-East Asia and the Pacific, followed by Europe and North America (19% and 17%, respectively), while Latin America and the Caribbean and sub-Saharan Africa received 6% and 2% of all investment, respectively (IRENA/CPI, 2023). At the country level, China led global investment growth, accounting for around 20%. Investment in the country has been driven by ambitious national energy transition strategies (see box III.2).

Figure III.5

Annual investment in renewable energies worldwide, by technology, 2013–2022
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Renewable Energy Agency (IRENA)/Climate Policy Initiative (CPI), *Global Landscape of Renewable Energy Finance, 2023*, Abu Dhabi, 2023.

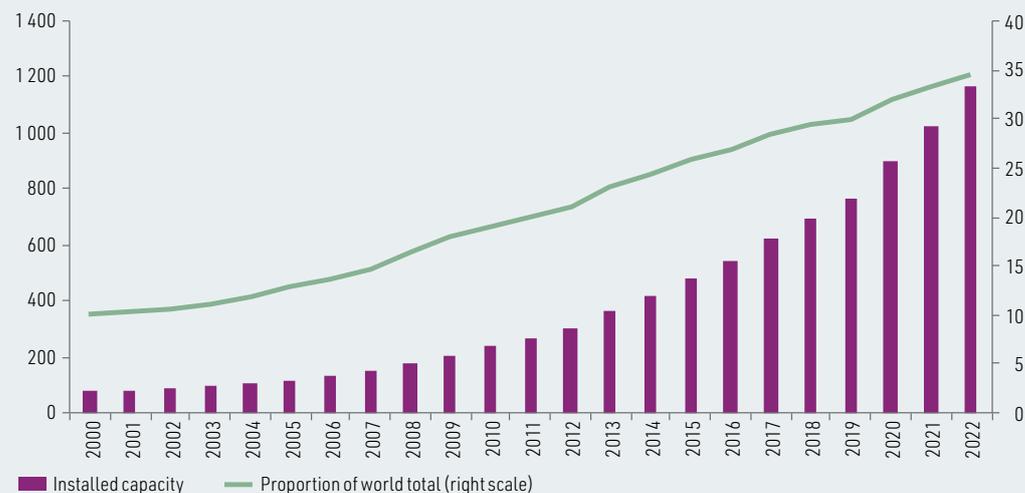
Box III.2

China: production development policies for renewables

China has the largest installed renewable energy capacity of any country in the world, accounting for 34% of the total. This capacity has grown enormously in the last 20 years, from just over 75 GW as of 2002 to almost 1,200 GW in 2022. The growth of the renewable energy sector in China has been the result of long-term strategies that have combined energy policies and objectives with production development policies, positioning the country as a world leader in the sector.

China: installed renewable energy capacity, in absolute terms and as a proportion of the world total, 2000–2022

(Gigawatts and percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Renewable Energy Agency (IRENA), "Statistics Data", 2022 [online] <https://www.irena.org/Data>.

In the 1990s, China implemented its first wind energy development policies. These policies did not have much impact on the sector because of the energy price and the lack of subsidy and incentive mechanisms. It was only in the early 2000s, within the framework of the tenth five-year plan, that China began to implement a series of energy and production development policies that allowed it to position itself as the leading player in the renewable energy sector. In 2005, in particular, it enacted the Renewable Energy Law, which laid the foundations for the development of the market and required companies operating on the grid to purchase and distribute all the renewable energy available (National People's Congress of China, 2005). In 2003, the government started to tender out the generation of renewable energy, and particularly wind energy, using auctions and feed-in tariffs. These two measures were crucial to the sector's development.

In addition, the government implemented a system of financial subsidies to promote domestic investment in renewable energy. Large-scale projects had to be approved by the central government while those smaller than 50 MW were approved at the provincial level, and the grid had to pay preferential prices for renewable energy. While the initial focus of energy policies was the wind industry, the government updated its energy policies in the late 2000s as part of the eleventh five-year plan in order to promote the development of photovoltaic solar energy. From 2010, auctions and feed-in tariffs included national mechanisms for photovoltaic solar energy projects, and the government designed subsidy schemes to encourage the installation of solar panels on building roofs and promote research, development and demonstration programmes in the area of photovoltaic panel production.

In parallel with its energy policies, the Chinese government pursued a number of production development policies to foster the development of renewable technologies (Zhang and others, 2013). The main measures included:

- Financial support for research and development: funds for the development of strategic technologies, national networks of research laboratories, research and development funding for State-owned enterprises in the sector.
- Incentives and subsidies for renewable technology-related equipment manufacturing: tax incentives for the import of components essential to local technology development, financing from national development banks for wind and solar technology-related manufacturing, and export credits.
- Local content requirement: in 2003, a minimum of 50% local content began to be required in tenders for renewable energy development, rising to 70% from 2004. This requirement was discontinued in 2009 as contrary to World Trade Organization (WTO) provisions.

The combination of energy policies and production development policies strengthened the local market and its capacity to supply domestic demand. In the case of solar panels, the combination of competitive pricing and efforts to develop industrial capabilities resulted in oversupply at the national level, which was crucial in lowering the price of the technology globally (IEA, 2021).

Competitive production costs and public sector investment attracted international investors from Europe and the United States to set up production plants in China. Domestic enterprises have acquired sophisticated technological capabilities and have all the characteristics needed to compete in the global market. The tenth five-year plan (2001–2005) included incentives for Chinese companies to invest in global markets. With a few exceptions, however, global integration in the renewable energy sector has been through trade and value chains. Chinese companies now dominate the solar energy value chain and are among the most competitive players in the wind energy chain. China's outward investments have been mainly concentrated in other Asian countries and have usually aimed at building up manufacturing capacity in nearby countries, such as Viet Nam and Malaysia (Tan and others, 2013).

The fourteenth five-year plan (2021–2025) identifies renewable energy and electricity transport as new strategic sectors and sets goals for strengthening the energy market, developing renewable technologies, improving electricity infrastructure and diversifying the energy mix (IEA, 2021).

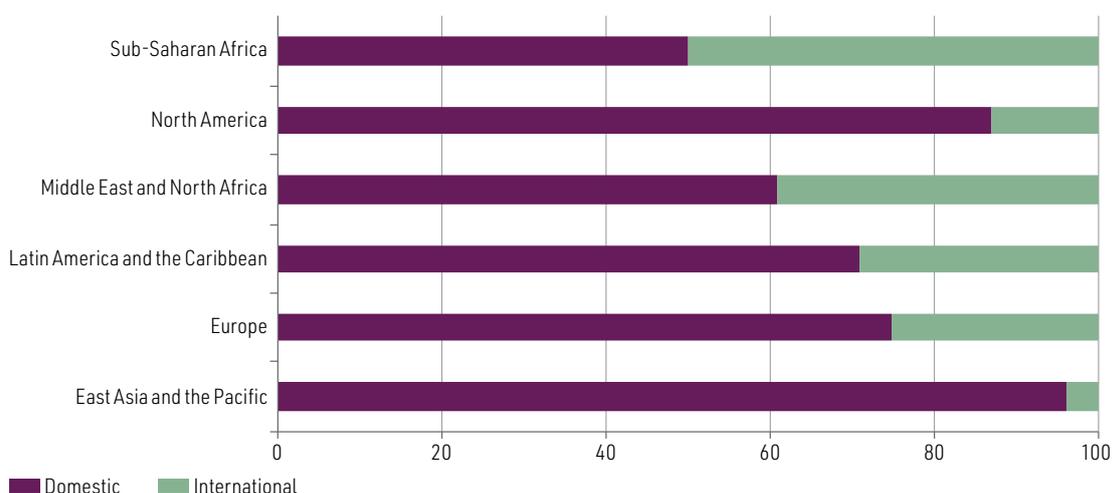
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Energy Agency (IEA), *An energy sector roadmap to carbon neutrality in China*, Paris, 2021; International Renewable Energy Agency (IRENA), "Statistics Data", 2022 [online] <https://www.irena.org/Data>; National People's Congress of China, "Renewable Energy Law of the People's Republic of China", 2005 [online] http://www.npc.gov.cn/zgrdw/englishnpc/Law/2007-12/13/content_1384096.htm; X. Tan and others, "China's overseas investments in the wind and solar industries: trends and drivers", *Working Paper*, World Resources Institute, 2013; S. Zhang and others, "Interactions between renewable energy policy and renewable energy industrial policy: a critical analysis of China's policy approach to renewable energies", *Energy Policy*, vol. 62, November 2013.

The importance of the private sector in renewable energy investment should also be stressed. Between 2013 and 2020, it mobilized an average of 74% of all renewable energy investment (IRENA/CPI, 2023), while the share of public investment has varied depending on the competitiveness of the technology. Also, policy mechanisms and instruments designed to promote the take-up of a given technology remain crucial in mobilizing private investment. In 2020, for example, thanks to the incentive schemes in place, 83% of investment in photovoltaic solar technologies came from the private sector. Commercial financial institutions and corporations have been the main private investors, accounting for almost 85% of total private investment in renewable energies (IRENA/CPI, 2023).

In regions with well-developed energy markets, such as North America, Europe and East Asia and the Pacific, around 80% of investment has been mobilized by the domestic private sector. In developing regions, international investment has played a more substantial role, contributing 30% of the total in Latin America and the Caribbean, 40% in the Middle East and North Africa and 50% in sub-Saharan Africa in the period 2013–2020 (figure III.6).

Figure III.6

Domestic and international investment in renewable energies in the different regions of the world as shares of the total, 2013–2020
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Renewable Energy Agency (IRENA)/Climate Policy Initiative (CPI), *Global Landscape of Renewable Energy Finance, 2023*, Abu Dhabi, 2023.

Public investment has been channelled mainly through State-owned financial institutions, public enterprises and local development banks, which together accounted for 70% of public sector investment between 2013 and 2020. In the latter year, in particular, public financing was one of the main catalysts for investment in China, and the China Development Bank was responsible for 90% of total public investment by national development banks worldwide. Similarly, China accounted for more than 80% of the investment efforts of State-owned financial institutions globally (IRENA/CPI, 2023).

While renewable energy investment and installed capacity have soared globally over the past 20 years, IEA has noted that achieving net zero by 2050 will require a tripling of annual renewable energy investment by 2030, from the average of US\$ 390 billion per year invested in the period 2016–2022 to US\$ 1.3 trillion per year in 2023–2030 (AIE, 2022d).

Financing the transition will therefore require increased public investment, the mobilization of both domestic and international private capital and the design of new financing mechanisms for developing countries. Multilateral development banks, multilateral climate funds and bilateral investments by development banks accounted for 22% of total investment between 2013 and 2020. However, international financial commitments to supporting renewable energy production, R&D in developing

countries have trended downward in recent years: in the case of Latin America and the Caribbean, the value of these commitments fell from an annual average of US\$ 4 billion between 2010 and 2018 to US\$ 1.5 billion in 2019 (IEA and others, 2022).

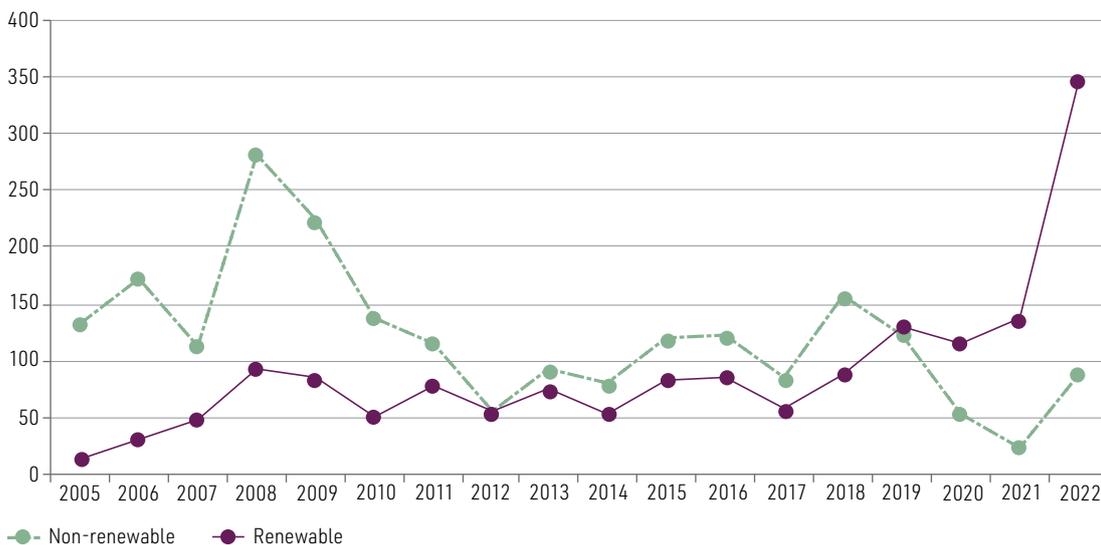
The energy transition in developing countries entails huge challenges. In a global landscape affected by multiple crises, their economic situation has deteriorated and fiscal space for resource mobilization is limited. The policies implemented in response to these challenges will play a crucial role in making the energy transition possible, most particularly because developed countries have brought in strategies that foreground the strategic use of public investment to guide the transition, leverage domestic and international private investment and build up capabilities.

B. Global trends in renewable energy foreign direct investment

The renewable energy sector has become increasingly important in the global investment landscape over recent years, with the value of renewable technology FDI project announcements outstripping that of non-renewable projects since 2019 (see figure III.7). In 2005, non-renewables mobilized 15 times as much investment as renewables. In 2022, by contrast, the latter attracted more than four times as much investment as the former, accounting for more than 80% of the total value of announcements in the energy sector. As the analysis in this study shows, the growth of FDI in renewables is a prime example of how sectoral production development policies and public incentives and regulations can stimulate investment in new economic sectors.

Figure III.7

Renewable and non-renewable energy investment project announcements worldwide, 2005–2022
(Billions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

The cascade of recent crises, including the energy crisis caused by the conflict in Ukraine, has had a twofold impact on renewable energy investment. First, Europe's need to diversify energy suppliers and decrease its energy dependence on imports has sent positive signals to the non-renewable energy market, particularly the gas sector. In 2022, non-renewable energy investment announcements returned to the levels prevailing before the COVID-19 pandemic in all quarters, peaking in the second (see figure III.8). Second, inflation and value chain disruptions have increased the capital

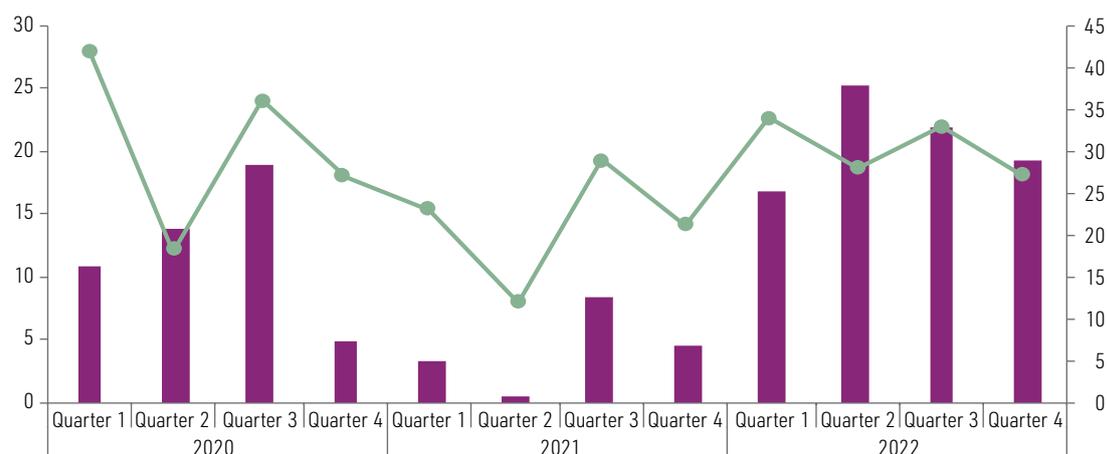
cost of investments. However, new renewable energy projects are still less costly than traditional ones (BloombergNEF, 2022). At the same time, a number of plans to advance the energy transition have been implemented, sending positive signals to the renewables market and increasing investor interest in the development of new projects. They include the plans presented by the European Union, namely the European Green Deal, the “Fit for 55” package of measures and the REPowerEU plan for saving energy, producing clean energy and diversifying energy supplies.³ There is also the Inflation Reduction Act passed in the United States in 2022, which provides financing and incentives for clean energy investment.⁴ The net impact seems to be positive: during the four quarters of 2022, the value of renewables announcements was more than three times as great as that of conventional energy announcements, peaking in the third quarter, when there were 119 announcements worth US\$ 108 billion.

Figure III.8

Foreign direct investment announcements in the energy sector worldwide, 2020–2022

(Billions of dollars and numbers)

A. Non-renewables



B. Renewables



■ Value ● Number (right scale)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

³ For further information on these plans, see [online] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en, <https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55-the-eu-plan-for-a-green-transition/> and https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/repower-eu-affordable-secure-and-sustainable-energy-europe_en.

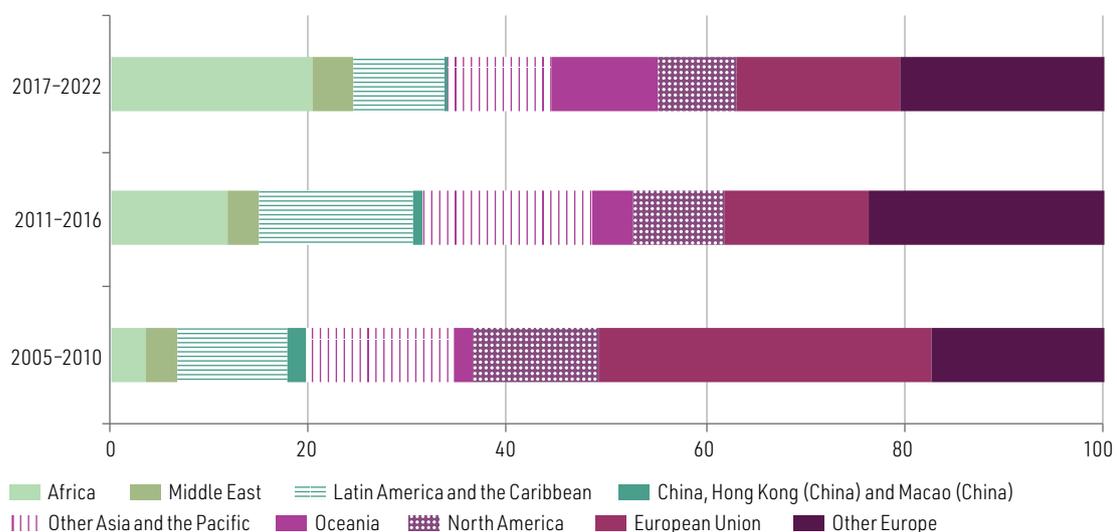
⁴ See [online] <https://www.epa.gov/green-power-markets/summary-inflation-reduction-act-provisions-related-renewable-energy#:~:text=Most%20provisions%20of%20the%20Inflation,%2C%20local%2C%20and%20tribal%20organizations.>

Over the last decade, the interest of international companies in renewables was mainly driven by the increasing competitiveness of the sector. The cost of generating renewable energy, and in particular photovoltaic solar and wind power, has decreased worldwide because of technological advances. Between 2010 and 2020, global average levelized costs fell by 85% for photovoltaic solar energy projects, 56% for onshore wind projects and 48% for offshore wind projects (IEA, 2022d).

The incentive and subsidy schemes established in developed countries have been crucial in bringing down the cost of renewable technologies and consolidating the position of those countries' energy companies on the international investment scene. Developed countries, and in particular those of the European Union, have managed to combine policies to develop their domestic markets with the search for new international markets, with the result that these countries are the leading international renewable energy investors. Between 2005 and 2010, investment was concentrated in Europe. European Union companies were responsible for 59% of the world's non-conventional energy investment project announcements and over 50% of the investments were in Europe: 35% in European Union countries and 17% in other European countries (see figure III.9). This changed in subsequent years.

Figure III.9

Announcements of foreign direct investment projects in renewable and non-conventional energies worldwide, by destination region, 2005–2022
(Percentages of total value)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

The global financial crisis of 2008 represented a turning point for renewable energy FDI. Companies developing renewable technologies sought alternatives in emerging markets. Developing countries with strong energy potential and policies to promote renewable energy became strategic investment destinations. Thus, between 2011 and 2016, Latin America and the Caribbean and Africa were the destinations for 15% and 12%, respectively, of total announced renewable energy FDI. During the same period, Asia and the Pacific attracted more than 22% of announced FDI. A special case is China, which, as explained in box III.2, while remaining a marginal player on the renewable energy FDI scene, has used domestic policies to pursue the development of renewable technologies and now has the world's largest installed capacity and a position of leadership in the sector's manufacturing chain.

As technologies and markets consolidated, the cost of financing the debt associated with renewable technology projects declined relative to fossil energy projects, increasing the competitiveness of the sector (Kempa, Moslener and Schenker, 2021). IEA estimates that the average return on investment is

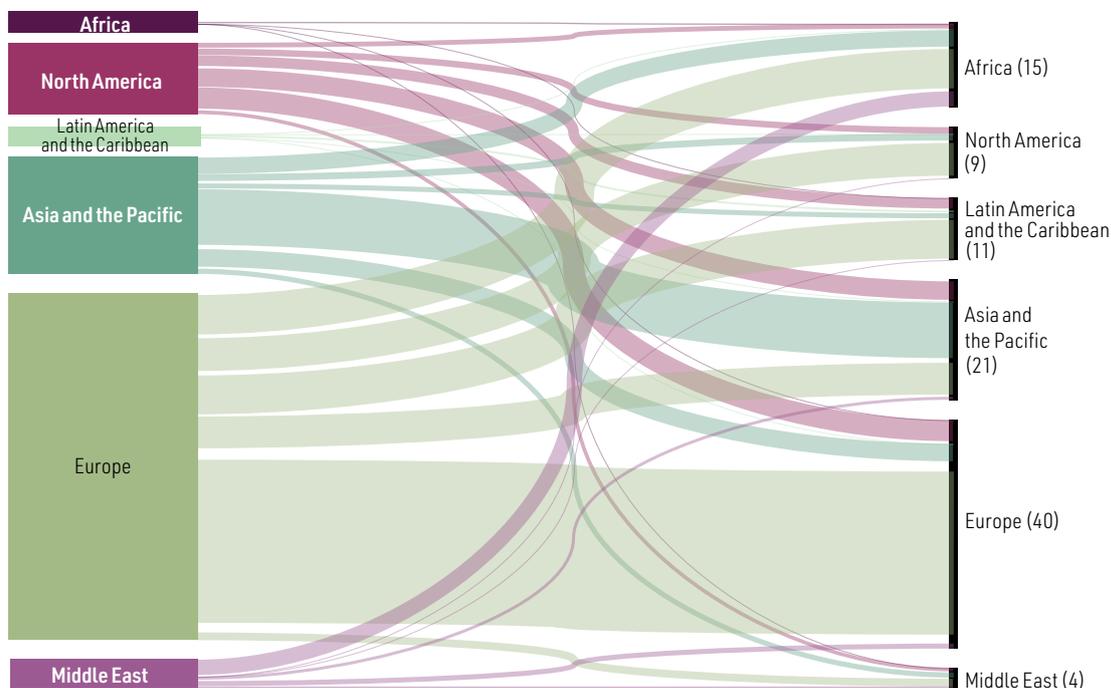
seven times as high for the renewable energy portfolio as for the fossil fuel portfolio (AIE/CCFI, 2021). The centrality of the energy transition for meeting global emissions reduction targets and the greater profitability of renewable energy projects have resulted in an increased geographical diversification of FDI. As figure III.9 shows, 20% of the renewable energy FDI announced between 2017 and 2022 was for African countries, 11% for those of Asia and the Pacific, 9% for those of Latin America and the Caribbean and 4% for those of the Middle East (figure III.9). It should be noted that while more than 80% of energy FDI projects in Europe and Oceania were in the renewable energy sector during the period under review, investor interest in developing countries was still mixed. In Africa, for instance, renewables attracted only 56% of FDI projects.

While European countries have lost share as a destination for renewable energy FDI, they still have a leading position in the investment landscape and a strong concentration of capital and technology. Between 2005 and 2022, FDI announced by European companies accounted for 61% of the total in the sector. Companies from Europe, in particular Italy, Spain and France, have been the leading investors in all regions of the world except Asia and the Pacific, where intraregional investments dominate (see diagram III.2).

Diagram III.2

Renewable energy foreign direct investment announcements worldwide, by origin and destination regions, 2005–2022

(Percentages of total value)

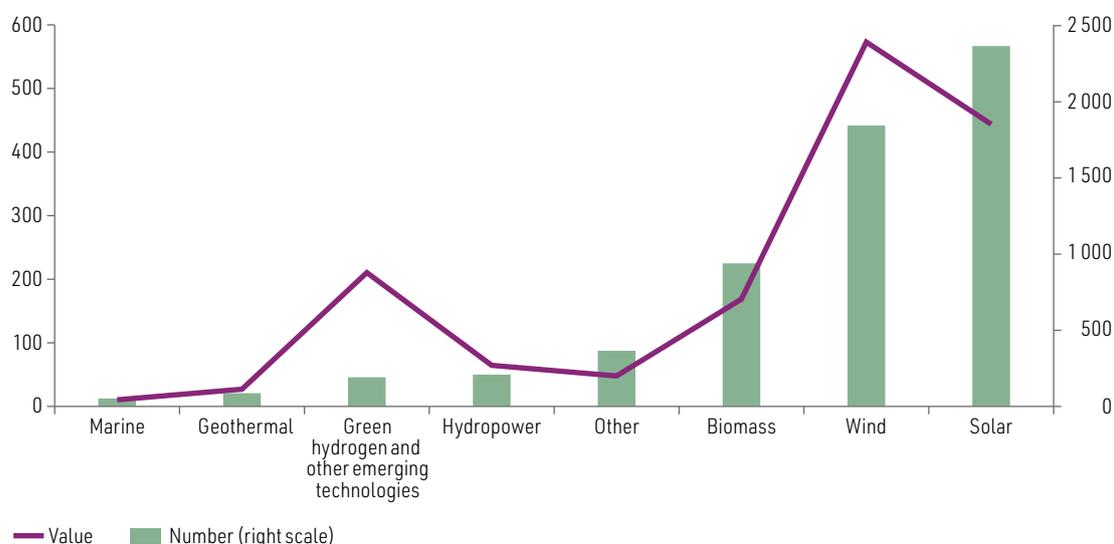


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

Solar and wind technologies have cemented their dominance, accounting for the bulk of FDI project announcements. Between 2005 and 2022, wind energy attracted FDI projects worth US\$ 570 billion, solar energy projects worth US\$ 444 billion and biomass and biofuels projects worth US\$ 170 billion. The three technologies accounted for 70% of all announced FDI in the sector (see figure III.10). Developed countries' policy agendas for advancing the energy transition have had a significant impact on emerging green technologies, especially storage technologies and green hydrogen. Since 2016, these technologies have mobilized US\$ 210 billion in announcements, or 14% of the total, and in 2022 they accounted for about 40% of announced global FDI.

Figure III.10

Renewable energy project announcements worldwide, by technology, 2005–2022
(Billions of dollars and numbers)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

1. Wind energy: the sector attracting the world's largest foreign direct investment announcements

The first international renewables investments were in large-scale wind power generation projects in developed countries, particularly the United Kingdom and the United States, where ambitious strategies to diversify energy sources, including incentives for the development of offshore wind projects, began to be pursued from 2008 onward (see box III.3). The early projects in the United Kingdom and the United States consolidated the leadership of European companies in the renewables landscape and set off a boom in investment announcements in the sector, which totalled US\$ 49 billion in 2009 (see figure III.11).

Box III.3

Incentives for the development of emerging technologies: wind power in the United Kingdom and the United States

The wind sector in the United Kingdom began to develop in the late 1990s with the creation of the British Wind Energy Association, which sought to develop technology for the offshore industry. The first research and development funds for wind turbines were set up during this period; in the late 1990s, furthermore, the Department of Energy announced a target for 10% of electricity to be generated from renewables and inaugurated eight offshore wind demonstration projects. The first of these projects came onstream in 2001 (Bilgili, Yasar and Simsek, 2011), and in the same year the Crown Estate announced the first tender of sites for offshore wind energy production. In parallel, the government announced subsidies for project development (Kern and others, 2014).

However, the real boost to the wind sector came after 2007, when the Government of the United Kingdom signed up to the European goal of deriving 15% of energy from renewable sources by 2020 (Toke, 2011). The Department of Energy and Climate Change (DECC) announced that stimulating large-scale industrial development of wind technology was essential to reduce project development costs and meet climate goals. In 2008, the Crown Estate tendered out 25 GW of offshore wind energy development. In 2009, to allow the

market to keep growing, the government introduced a mandatory quota system for energy produced with emerging technologies and introduced incentives and feed-in tariffs for the renewable energy sector. Energy policies and incentives for wind energy production attracted international capital from Europe and the United States. In this context, offshore energy production rose to 2.7 GW, so that in 2012 the United Kingdom became the world leader by installed capacity (Kern and others, 2014).

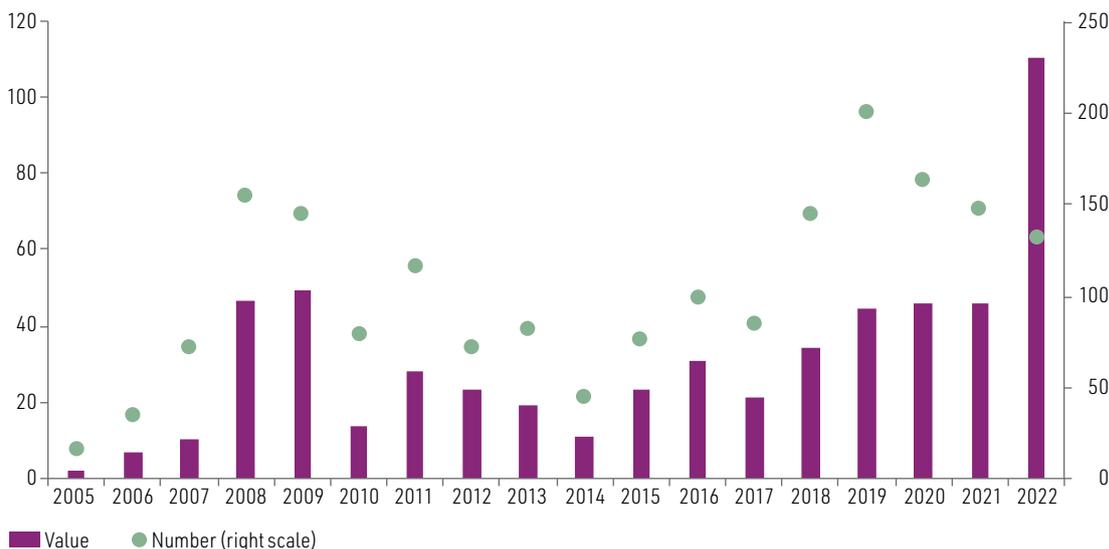
In the United States, the development of the wind sector was also the result of a combination of public policy and market factors. The federal government began to fund research and development programmes for wind turbines in the 1970s. In 1992, the Energy Policy Act was passed, introducing a number of incentives for the development of the sector, most particularly the federal Production Tax Credit (PTC), a subsidy for wind power generation paid for the first 10 years of a project's operation (Wiser, Bolinger and Barbose, 2007). In the same year, a technology-neutral incentive for the development of renewable energies was created. Thanks to the PTC, which reduced project costs and guaranteed a minimum 10-year payback, the sector developed rapidly until the United States had the world's third-largest installed wind power capacity (Bird and others, 2005).

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of M. Bilgili, A. Yasar and E. Simsek, "Offshore wind power development in Europe and its comparison with onshore counterpart", *Renewable and Sustainable Energy Reviews*, vol. 15, No. 2, February 2011; F. Kern and others, "From laggard to leader: explaining offshore wind developments in the UK", *Energy Policy*, vol. 69, June 2014; D. Toke, "The UK offshore wind power programme: a sea-change in UK energy policy?", *Energy Policy*, vol. 39, No. 2, February 2011; R. Wiser, M. Bolinger and G. Barbose, "Using the federal production tax credit to build a durable market for wind power in the United States", *The Electricity Journal*, vol. 20, No. 9, November 2007; L. Bird and others, "Policies and market factors driving wind power development in the United States", *Energy Policy*, vol. 33, No. 11, 2005.

Figure III.11

Wind energy project announcements worldwide, 2005–2022

(Billions of dollars and numbers)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

Before the COVID-19 pandemic, investment in the wind sector had picked up again, with projects worth more than US\$ 245 billion announced between 2019 and 2022. In particular, 2022 was a record year for the sector, with 131 announcements worth a total of more than US\$ 110 billion. The rising cost of capital because of inflationary pressures may explain some of the increase in the value of investments over the last three years. However, the growth of wind energy FDI has been mainly due to the increasing role of offshore wind projects and renewed international commitments relating to the energy transition.

In 2021, 113 GW of new wind capacity was installed, compared with only 59 GW in 2019, and wind energy generation increased by 17%, the highest growth rate of any renewable energy technology. China was the main contributor to the sector's growth, followed by the United States and Brazil (IEA, 2022c). Many countries have put in place policy initiatives to assist the development of wind energy, including specific tools to facilitate the installation of new capacity, such as auctions, feed-in tariffs, incentives and subsidies, and renewable energy portfolio standards.

Geographically, investment has been mainly concentrated in Europe, where FDI projects worth a total of US\$ 342 billion were announced between 2005 and 2022. The United Kingdom, the United States and Italy were the top three destinations, attracting 48% of total investment between 2005 and 2022. Since the global financial crisis of 2008, some developing countries such as Viet Nam, Egypt, Brazil, Chile and Mexico have become destinations of interest for international investment.

Investments in wind energy have been dominated by a few companies, most of them European. Of the top 10 investors, seven are from Europe, one from the United States and one from Japan. Together, these companies accounted for 40% of total investment. The European companies Energias de Portugal (EDP), Iberdrola and Enel are the largest investors with almost 300 announced projects worth more than US\$ 97 billion, representing 17% of total investment announcements (see table III.1).

Table III.1

Top 10 investors in wind energy worldwide, 2005–2022

Company	Announcements (Number)	Capital invested (Millions of dollars)	Average investment (Millions of dollars)	Country
Energias de Portugal (EDP)	63	38 925	618	Portugal
Iberdrola	108	33 907	314	Spain
Enel	127	24 299	191	Italy
RWE	62	23 517	379	Germany
Ørsted (Dong Energy)	53	20 472	386	Denmark
Électricité de France (EDF)	63	18 432	293	France
Equinor (formerly Statoil)	18	17 681	982	Norway
Marubeni	2	16 020	8 010	Japan
AES	12	15 305	1 275	United States
BlueFloat Energy	7	14 633	2 091	Spain

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

The biggest announcements in recent years have been for offshore wind energy projects. In 2022, Viet Nam was the location for the world's largest project.⁵ In 2020, the government of the United Kingdom announced its Ten Point Plan for a Green Industrial Revolution, whose first goal was to have 40 GW of offshore wind capacity in place by 2030, generating opportunities for investment to install more than 25 GW. Between 2020 and 2022, the United Kingdom received investment of almost US\$ 100 billion, equivalent to 49% of total investment in the period.⁶ Another country that has launched major policy initiatives to promote the wind energy sector is France, which in 2022 announced investments of more than 1 billion euros in renewable energy as part of the France 2030 national investment plan,

⁵ AES of the United States announced a 4 GW offshore wind project in Binh Thuận province worth US\$ 13 billion. The project should double the installed wind capacity of Viet Nam, which has set itself the target of having 11.7 GW of installed capacity in place by 2030 and 66 GW by 2045. Development of the country's wind sector has been promoted since 2011, when the 2011–2020 national strategy for the development of wind energy was published, establishing feed-in tariffs for wind power, subsidies and reductions in land use fees and profit taxes for wind power projects. For more information, see the Prime Minister's Decision No. 37/2011/QĐ-TTg of 2011 on the mechanisms supporting the development of wind power projects in Viet Nam.

⁶ In 2020, Equinor and Vårgrønn of Norway and SSE Renewables of the United Kingdom announced a US\$ 10 billion project to build the Dogger Bank Wind Farm, which will generate 3.6 GW and supply around 5% of the United Kingdom's energy needs. In 2021, Germany's Energie Baden-Württemberg, in a cooperation agreement with BP, announced a US\$ 9 billion project to generate 2.9 GW of offshore wind power. Lastly, in August 2022, Japan's Marubeni, in cooperation with the United Kingdom's SSE Renewables and Denmark's Copenhagen Infrastructure Partners, announced a US\$ 12 billion project to generate 3.6 GW.

with the goal of doubling installed capacity to 100 GW. Offshore wind generation will represent 40% of total installed capacity.⁷ Similarly, in 2021 the United States announced a strategy to encourage the development of offshore wind energy with a view to bringing capacity up to 30 GW by 2030.⁸

While offshore projects have represented an attractive opportunity for large investors, energy companies have continued to invest in onshore wind energy projects. In 2020, for example, Enel of Italy announced a US\$ 810 million project to generate 1.01 GW of wind power in Brazil. Spain's ACCIONA, meanwhile, has announced a US\$ 1 billion project to generate 1.03 GW in Australia.

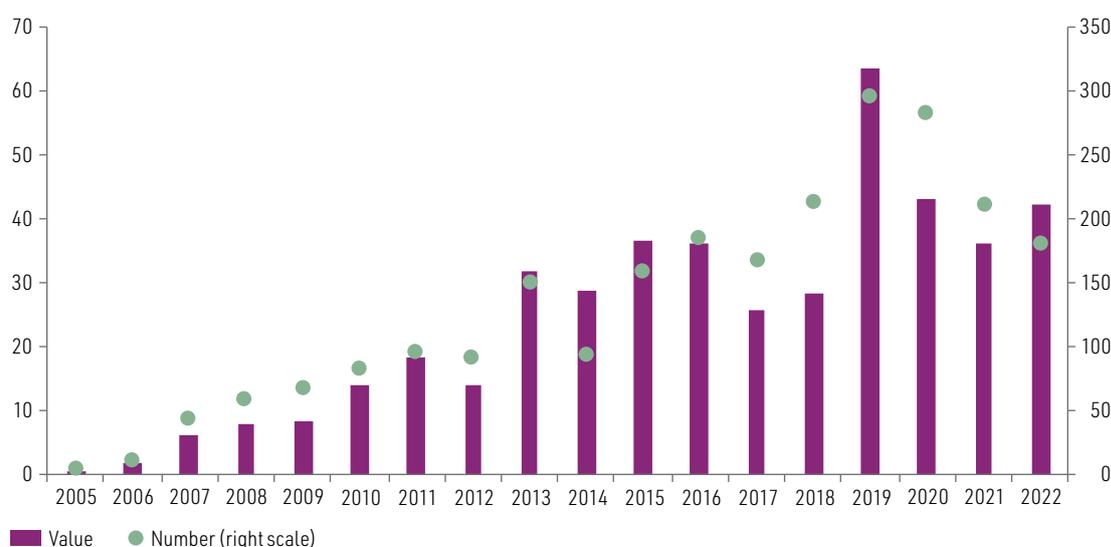
Investments in wind energy, both offshore and onshore, are expected to continue growing in the coming years. IRENA (2022a) estimates that meeting the 2030 goals of the Paris Agreement will necessitate 3,380 GW of wind power, requiring installed onshore wind capacity to increase fourfold and offshore wind capacity elevenfold relative to 2020. Thus, in the coming years, FDI will play a key role in the deployment of wind energy, particularly in developing countries. Public sector support continues to be the main driver of wind energy investment in most of the world. Countries that have succeeded in attracting FDI projects have policy initiatives for wind energy, concrete targets for increasing installed capacity, favourable regulatory frameworks for investment in the sector, technology-specific incentives and subsidies, and instruments to support the use of local content in project development.

2. Solar energy: public policies and falling costs have driven the sector's internationalization

Solar technology has had the most dynamic investment performance of any renewable energy: whereas there were just two projects worth US\$ 300 million in 2005, FDI announcements peaked in 2019 at more than 290 projects worth a total of US\$ 63 billion (see figure III.12). However, the impact of the COVID-19 pandemic and the conflict in Ukraine on supply chains slowed investment in the sector, and between 2020 and 2022, projects worth an average of US\$ 40.5 billion per year were announced.

Figure III.12

Solar energy project announcements worldwide, 2005–2022
(Billions of dollars and numbers)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

⁷ For further information, see [online] <https://www.vie-publique.fr/discours/283773-emmanuel-macron-10022022-politique-de-lenergie>.

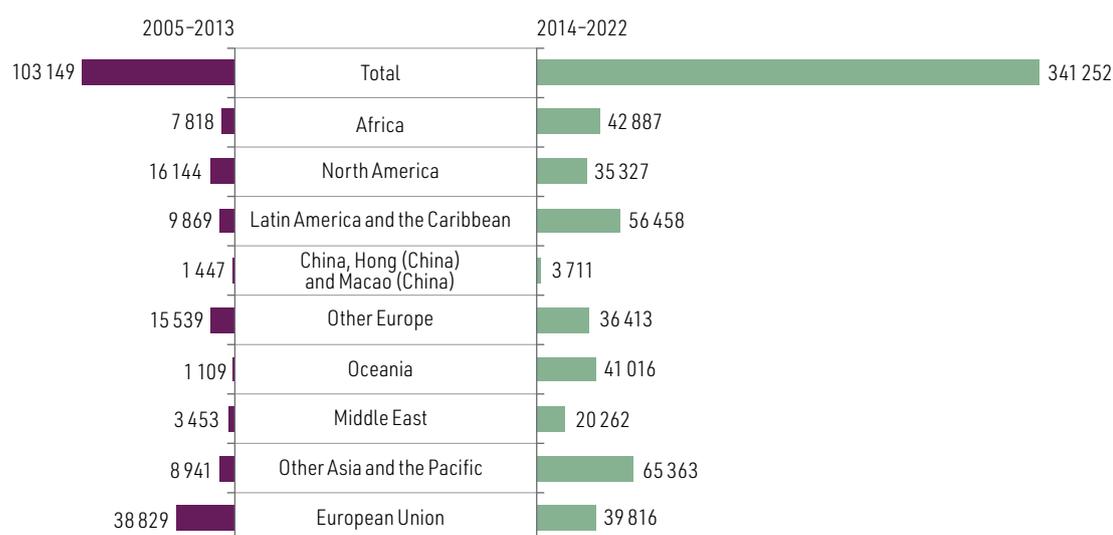
⁸ For further information, see [online] <https://www.whitehouse.gov/briefing-room/statements-releases/2022/09/15/fact-sheet-biden-harris-administration-announces-new-actions-to-expand-u-s-offshore-wind-energy/>.

Since the late 1990s, many countries have stepped up their efforts to accelerate the transition to alternative energy sources.⁹ A key element in the internationalization of the solar energy sector was the introduction of feed-in tariffs in the early 2000s. With these tariffs, governments guaranteed that clean energy would be purchased at above-market prices. Feed-in tariffs spread rapidly across Europe, leading to the development of the solar energy sector (Georgallis, Dowell and Durand, 2019).

Energy companies took advantage of the benefits of feed-in tariffs to enter new countries, driving the sector's first wave of internationalization. Between 2005 and 2013, 53% of solar FDI projects were in European countries (figure III.13). The internationalization of the sector and a growing international commitment to the energy transition drove down the price of solar technology. Between 2010 and 2021, the global weighted average cost of photovoltaic solar projects decreased by 88%, making solar the most efficient technology for power generation (IRENA, 2022c).

Figure III.13

Solar power project announcements worldwide, by destination region, 2005–2013 and 2014–2022
(Millions of dollars)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

During the 2010s, falling generation prices and the popularity of policies to support the solar sector in developing countries led to solar FDI becoming truly global in reach. Between 2014 and 2022, FDI in the sector totalled US\$ 340 billion and its geographical distribution changed significantly: only 23% of projects were in Europe, while 20% were in Asia and the Pacific, 16% in Latin America and the Caribbean, 13% in Africa, 12% in Oceania, 10% in North America and 6% in the Middle East. The main destinations were Australia (US\$ 40 billion), the United States and the United Kingdom. Chile ranked fourth by the total value of project announcements and was one of the countries displaying the highest growth in announced investments, which rose from US\$ 5 billion between 2005 and 2013 to US\$ 18 billion between 2014 and 2022.

⁹ Japan was one of the first countries to implement a strategy for the development of the solar sector with its 1974 “Sunshine” project, a long-term national strategy to develop renewable technologies and invest in R&D with a view to guiding the efforts of industry and academia towards the development of more efficient technologies (Shimamoto, 2020). Similarly, in 1991, Germany implemented its 100,000 Roofs initiative, offering loans at below-market interest rates for the installation or expansion of photovoltaic systems and the development of demand for solar technologies (Chowdhury and others, 2014). Both initiatives aimed to develop the market and position the country as a leader in the solar energy sector.

Between 2014 and 2022, the European Union cemented its position as the main investor, originating 43% of the total value of project announcements. Europe and Asia and the Pacific continued to be markets where intraregional investment was very important: 63% of all projects announced in Europe and 50% of those announced in Asia and the Pacific were intraregional. Spain, France and Canada were the main investors, accounting for 28% of the total value of project announcements. Special mention should be made of China, the sixth-ranking country by the value of its project announcements during the period: the total value of its announcements rose from US\$ 6 billion between 2005 and 2013 to more than US\$ 23 billion between 2014 and 2022. Chinese outward investment began increasing in 2010 and peaked at US\$ 7 billion in 2014.

Between 2005 and 2022, the top 10 companies by the value of their FDI announcements originated 22% of investments and 16% of projects. Canadian Solar Inc. of Canada was the largest investor, announcing projects worth US\$ 16.6 billion, followed by Singapore-based Sun Cable, which invested US\$ 15 billion in a single 10 GW project in Australia (see table III.2).¹⁰ Italy's Enel ranked third by the amount invested and first by the number of projects. In the period under review, the firm announced more than 100 projects worth a total of US\$ 14 billion, with 40% of the total announced amount being for Latin America and the Caribbean and 38% for the European Union.

Table III.2

Top 10 solar energy investors worldwide, 2005–2022

Company	Announcements (Number)	Capital invested (Millions of dollars)	Average investment (Millions of dollars)	Country
Canadian Solar Inc.	65	16 638	256	Canada
Sun Cable	1	15 556	15 556	Singapore
Enel	107	14 456	135	Italy
SkyPower	24	8 990	375	Canada
Électricité de France (EDF)	40	8 749	219	France
Abengoa	14	8 418	601	Spain
Opdenenergy	35	7 785	222	Spain
TotalEnergies	34	6 888	203	France
SunEdison Inc.	35	6 069	173	United States
Impala SAS	23	5 610	244	France

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

The COVID-19 pandemic and its impacts on value chains were a turning point for the sector. The increase in the cost of capital cut short the downward trend in costs seen over the previous decade and led to a rise in contract prices. In the last two years, prices awarded for solar power generation at auctions have been higher in most countries around the world, leading to delays in the signing of new contracts.

While rising prices have had an impact in all regions and present a challenge for project developers that have won auctions at competitive prices and face higher costs when it comes to implementation, the cost of solar generation remains competitive with that of other energy sources. IRENA (2019) estimates that photovoltaic solar investment needs to increase by 68% relative to 2019 to meet the 1.5 °C scenario, which would indicate a potentially greater role for FDI in meeting the demand for investment in the sector.

¹⁰ For further information on Sun Cable, see [online] <https://suncable.energy/>.

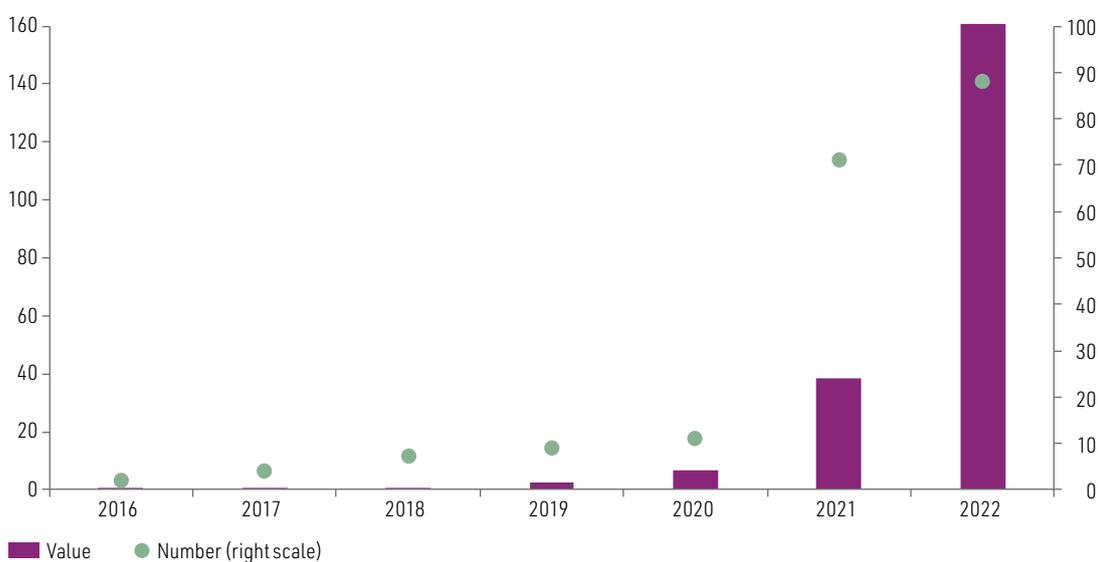
3. Green hydrogen and other clean technologies: the boom in 2022

In the last three years, the development of projects in the category known as green hydrogen and other clean technologies has attracted the interest of international investors, who allocated a total of US\$ 201 billion to these technologies between 2020 and 2022 (see figure III.14). Of the total announced amount, 55% was for Africa, 16% for Europe and 15% for Oceania. The Middle East and Latin America and the Caribbean were the destinations for 5% and 4% of the total, respectively. While Asia and the Pacific was the region with the smallest volume of announced projects (a total of US\$ 6.6 billion), hydrogen and other clean technology projects worth a total of US\$ 63 billion were announced, more than for any other region; only the European Union was close, with projects worth US\$ 61 billion. At the country level, Egypt, Australia and Spain received projects worth US\$ 94 billion, US\$ 32 billion and US\$ 22 billion, respectively, representing 72% of total announced investments.

Figure III.14

Announcements of foreign direct investment in green hydrogen and other clean technologies worldwide, 2016–2022

(Billions of dollars and numbers)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

In contrast to the situation with solar and wind energy, the companies that have invested most in hydrogen and other clean technologies have committed to a few high-value projects, most of which were announced in 2022. For example, POSCO of the Republic of Korea announced a US\$ 28 billion project to produce hydrogen from wind and solar power in Australia, positioning itself as the leading investor in the sector (Argus, 2022). For its part, Globeleq of the United Kingdom announced an US\$ 11 billion project in the Suez Canal special economic zone in Egypt to produce 3.6 GW of electrolyzers and 9 GW of solar and wind power.

Of particular note is the involvement of the oil majors, such as Shell, Eni, TotalEnergies and BP, which are repositioning their business models by investing in green hydrogen and other clean technologies, transforming existing assets and launching new industrial development projects.

In 2022, for example, Shell announced the construction of a hydrogen plant in the port of Rotterdam (Netherlands) that is expected to produce 200 MW of electrolyzers and 60,000 kg of hydrogen per day from 2025 (Shell, 2022).

While FDI announcements in the sector reveal a growing interest from companies in clean technologies and particularly in green hydrogen, most of the announced projects are at very early stages—which is to say the demonstration stages—with little electrolyser capacity (MarketsandMarkets, 2023). More than 90% of demand is still being met mainly by traditional energies, particularly natural gas and coal (IEA, 2022a). While falling prices in the renewables sector and technological improvements in electrolyser production have increased the commercial viability of projects, green hydrogen remains very expensive to produce compared to fossil sources (BloombergNEF, 2020).

Global hydrogen demand was in excess of 94 Mt in 2021, however, and is expected to reach 180 Mt by 2030 to meet the requirements of the 1.5 °C scenario (IEA, 2022a). As happened in Japan in 2017, strategies to promote green hydrogen production have been launched in more than 28 countries (IEA, 2022a). In particular, spending on green hydrogen technology R&D in European countries has doubled since 2021, with these technologies receiving 5% of all resources allocated to renewable technologies. Most national plans and strategies have set targets for green hydrogen production as part of their energy transition road maps. It should be noted that demand for this product is still incipient and largely confined to the transport and mobility sector. Orienting green hydrogen production development strategies towards strengthened generation and production capabilities and the development of new technologies will be crucial to sustain demand and accelerate the use of green hydrogen in industrial sectors.

4. Other energy sources

Between 2005 and 2022, other renewable energy sources such as biomass and hydroelectric, geothermal and marine energies accounted for less than 20% of investment in the renewable energy sector, with announcements totalling US\$ 315 billion. Investments in biomass projects were the most dynamic component (11% of total investment), followed by hydropower (4%), geothermal energy (2%) and marine projects (1%).

In the period mentioned, there were 935 biomass project announcements, worth a total of US\$ 169 billion. Announcements peaked between 2007 and 2008, when announced investments averaged US\$ 18 billion per year. Amounts began to progressively decline thereafter, so that in 2017 the total was US\$ 2 billion. There was a slight increase over 2021 and 2022, however, with biomass project announcements averaging US\$ 9 billion between 2019 and 2022. In 2022, biomass attracted 3% of all renewable energy investment. The main destination regions were Europe and Asia and the Pacific, which received 39% and 23% of all investment between 2005 and 2022, respectively, followed by Latin America and the Caribbean, which received 12%. At the country level, the United Kingdom, the United States and Brazil were the top destinations, receiving 16%, 8% and 7% of investment, respectively. European companies dominated investment, accounting for 50% of all announcements, followed by United States companies with 22%.

In the case of hydropower, 217 projects totalling US\$ 62 billion were announced between 2005 and 2022. Overall, international investment has not been a driver of development in this sector, which accounted for an average of 4% of all renewable energy FDI announcements during the reporting period. The countries of Asia and the Pacific received 36% of investments, followed by those of Europe (27%) and Latin America and the Caribbean (25%). At the country level, Chile was the leader, receiving 13 projects totalling almost US\$ 5 billion, followed by the Lao People's Democratic Republic, Pakistan and Brazil. In total, these four countries accounted for 30% of all hydropower investments. Europe was responsible for 50% of investments, followed by countries of Asia and the Pacific (37%).

However, owing to the environmental and social issues associated with the development of large-scale hydropower projects and the effects that climate change and shifting rainfall patterns can have on power generation, investment has declined over the past 20 years, from an annual average of almost US\$ 6 billion between 2007 and 2011 to less than US\$ 1 billion per year between 2019 and 2022. Since 2020, in particular, hydropower projects have accounted for less than 0.3% of all renewable energy investment.

Between 2005 and 2022, geothermal and marine energy attracted 96 and 61 projects, respectively, totalling US\$ 36 billion. Geothermal investments were more evenly distributed across regions: Europe accounted for 32%, Asia and the Pacific for 23%, Africa for 21%, the Middle East for 13%, Latin America and the Caribbean for 8% and North America for 3%. Geothermal investment averaged less than US\$ 2 billion per year during the period, peaking at US\$ 6 billion in 2006. In 2022, geothermal energy investment accounted for 0.05% of all renewable energy investment. International investment in marine energy was mainly concentrated in Europe, the destination for more than 60%, followed by Asia and the Pacific, which received 25%. Overall, investment remained below US\$ 1 billion per year, peaking in 2022 at US\$ 2.33 billion. In particular, France's Sabella has announced two turbine installation projects in the United Kingdom totalling US\$ 1.6 billion.

5. Mergers and acquisitions: a strategic tool for market access

Although FDI projects are the best proxy indicator for analysing international investment in the renewable energy sector, the analysis of mergers and acquisitions reveals important milestones in the evolution of the sector and allows the internationalization strategies of companies to be characterized.

The mergers and acquisitions market in the energy sector has some specific characteristics. First, this is a highly regulated sector driven by national interests and participated in by State-owned companies in many countries. Moreover, it is characterized by high upfront capital costs, economies of scale and the need for vertical technological integration (Galperina and Klen, 2017). Thus, merger and acquisition dynamics are driven by developments both in the sector globally and in specific regional and technology markets.

The number of deals in the global renewable energy sector held steady between 2015 and 2019, with an average of 700 mergers and acquisitions per year.¹¹ Although there are still fewer mergers and acquisitions in renewables than in the conventional energy sector, international environmental commitments and the energy crisis driven by the conflict in Ukraine have increased corporate interest in the sector (Busscher and others, 2022). The last two years have seen an increase of more than 50% in the number of transactions compared to pre-pandemic levels.

Most transactions were between companies in the same country, and only 40% involved the purchase of assets in a foreign country. However, 71% of transnational transactions qualified as FDI, suggesting that the strategic objective of seeking assets abroad has been to take control of them and access new markets (see figure III.15).¹²

¹¹ Merger and acquisition data were obtained from Bloomberg and contained information on all transactions by listed companies in the renewable energy sector with information available for the period 2015–2022. During that period, 6,197 transactions involving the purchase of assets in the renewable energy sector were identified. Information on the value of the transactions was available for only 594 of these observations.

¹² According to the International Monetary Fund (IMF) *Balance of Payments and International Investment Position Manual: Sixth Edition (BPM6)*, a transaction is deemed to be FDI when 10% or more of equity is purchased.

Figure III.15

Characteristics of mergers and acquisitions in the renewable energy sector worldwide, 2015–2022
(Numbers of transactions)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

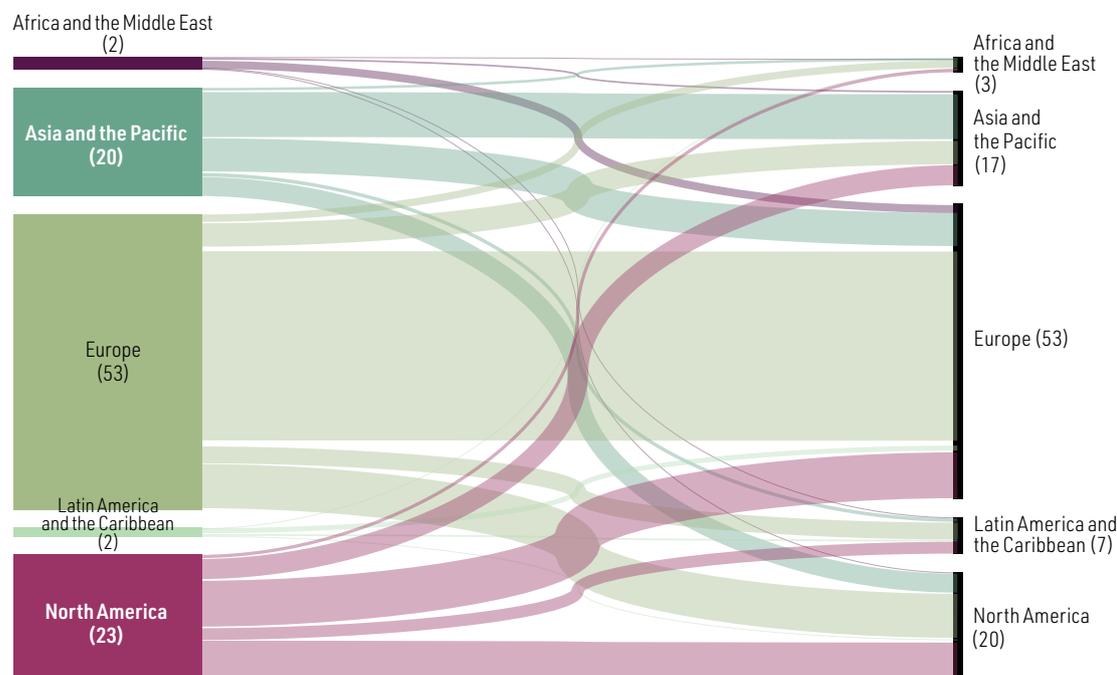
Cross-border mergers and acquisitions in the renewable energy sector have held steady over the last eight years and still represent less than 1% of all cross-border deals. The dynamics of the market are mainly regional and dominated by developed countries. To the fore are cross-border investments by European companies, which have been more dynamic than domestic transactions, outnumbering them since 2017 and accounting for 58% of all transactions concluded in 2022. The main reasons for this are related to the characteristics of the European market. Since the adoption of the European Union's Renewable Energy Directive in 2009, Europe has been one of the world's leading regions for the development of renewable energy technologies. This has both created the conditions for the consolidation of the renewables market among European countries and enabled companies to position themselves as major players in the global renewables market. Transnational transactions have been carried out by European utilities mainly with the aim of developing the regional market. Between 2015 and 2022, Europe was the origin and destination of 53% of FDI deals in the sector, followed by North America and Asia and the Pacific (see diagram III.3). At the country level, the United States, the United Kingdom, Spain and Germany were the main destinations for cross-border mergers and acquisitions, accounting for almost 38% of the total number of transactions. Similarly, investors from the United States, the United Kingdom, Canada and Germany were responsible for 41% of deals.

In recent years, the energy transition and growing interest in the renewable energy sector have led to an increase in the acquisition of strategic assets in the sector; non-energy players have become interested in buying green assets as part of their strategy. Most of the deals registered have been driven by investment companies in the financial sector and by traditional energy companies. The growing need to strengthen environmental, social and governance assets to raise finance has driven corporate strategies aimed at adding green assets to reduce carbon emissions in line with the goal of net zero. Companies in the traditional energy sector, for example, are acquiring solar and wind generation assets to offset emissions from their well drilling and completion operations. Similarly, many companies are acquiring renewable energy and green technology assets to restructure the composition of their portfolios and reposition themselves in energy sector value chains.¹³

¹³ The Anglo-Dutch firm Shell, for example, has initiated activities in the renewable energy sector by acquiring green assets in renewable energy companies and by signing long-term bilateral agreements for the purchase of renewable assets. In 2022, Shell acquired Spain's Green Tie Capital, a company specializing in investments, divestments and the management and development of sustainable assets, with the aim of undertaking more than 2 GW of photovoltaic projects. Similarly, Italy's Eni has launched a strategy to acquire renewable energy assets in order to meet the goal of net zero. Of particular note is Eni's positioning in the United Kingdom wind industry, which it consolidated with two deals to purchase assets in the world's largest offshore wind farm project, Dogger Bank.

Diagram III.3

Mergers and acquisitions in the renewable energy sector, by regions of origin and destination, 2015–2022
(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

C. Opportunities for the development of renewable energies in Latin America and the Caribbean

Latin America and the Caribbean has one of the cleanest electricity generation mixes of any world region. On average, the region produces 8.1% of global greenhouse gas emissions, a figure that is proportional to its population (World Bank, 2022). At the subregional level, the Caribbean contributes 0.4% of all global emissions, Central America 1.7% and South America 6.1%. The region's emissions have increased in all sectors since the 1990s, driven by economic growth. Emissions from the energy sector, which accounts for more than 43% of the regional total, have increased the most, from 1,052 MtCO₂e in 1990 to 1,789 MtCO₂e in 2019 (ClimateWatch, 2023).

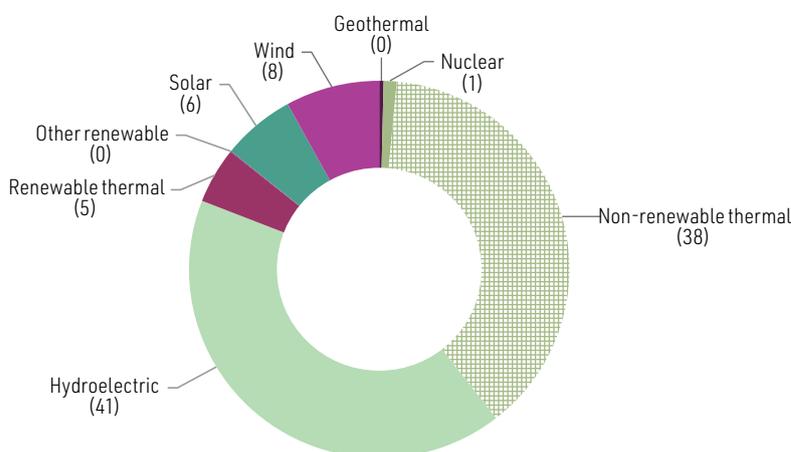
The region's primary energy supply is still dominated by fossil fuels (66%). Over recent decades, however, its countries have implemented ambitious policies to diversify the energy mix and made considerable progress in developing the renewable energy sector. On average, the supply of energy generated from renewable sources constitutes almost 33% of the region's total, compared to an average of 13% globally (ECLAC, 2023).

While the share of installed renewable capacity in the region is still higher than the global average, this is mainly due to installed hydropower capacity, which accounted for more than 41% of total installed capacity in 2021. Wind accounted for 8%, solar for 6.2%, biomass for 4.8% and geothermal for 0.4% (see figure III.16). Moreover, installed capacity has been relatively slow-growing: between 2020 and 2021, it increased by only 7% to 292 GW, with 54.2% of the new capacity coming from solar energy, 31.5% from wind energy, 10.5% from biomass and the remaining 3.3% from hydropower (OLADE, 2022). For the region's growth rate to approach the global rate projected for the next five years, more than 150 GW of renewable generating capacity would need to be added between 2023 and 2027, and installed wind and solar capacity would need to more than double. This would

mean building new renewable capacity, mainly wind and solar, which account for only 18% of the region's installed renewable energy capacity, compared to 50% globally. Solar and wind penetration in the region is still largely confined to a few countries: 71% of total regional installed capacity is in Argentina, Brazil, Colombia and Mexico. The countries of the region have been accelerating the installation of solar and wind power generating facilities, with capacity increasing by 36% and 18%, respectively, between 2019 and 2020. Following behind these are bioenergy with an increase of 2% and hydropower with an increase of 1% (OLADE, 2022).

Figure III.16

Latin America and the Caribbean: distribution of installed electricity generation capacity, by technology, 2021
(Percentages)



Source: Latin American Energy Organization (OLADE), *Panorama energético de América Latina y el Caribe 2022*, Quito, 2022.

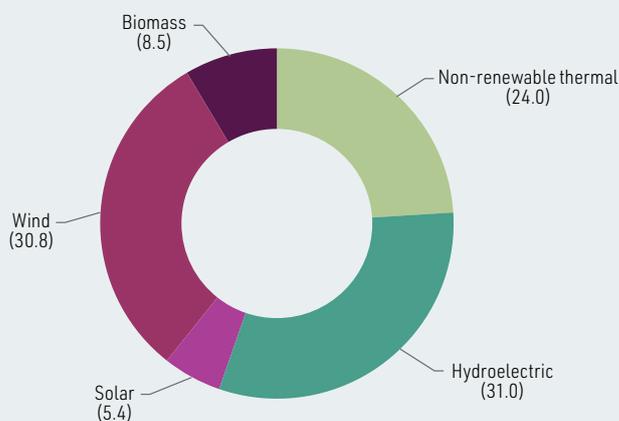
Box III.4

Renewable electricity generation: the case of Uruguay

Uruguay has successfully diversified its renewable generating sources on the path to the energy transition. In particular, more than 85% of the electricity the country generates now comes from renewable sources. Of these, wind and solar account for more than 40%, and there are hourly spikes in which they account for close to 90% of the total.

Uruguay: distribution of installed electricity generation capacity, by technology, 2021

(Percentages)



Source: Latin American Energy Organization (OLADE), *Panorama energético de América Latina y el Caribe 2022*, Quito, 2022.

Greenhouse gas emissions from Uruguay's electricity sector are one thirtieth the global average. Furthermore, the incorporation of solar and wind energy has produced more than just environmental benefits. In particular, the cost of supplying the country's demand has fallen by more than 40% and nearly 50,000 jobs have been created.

The first long-term national energy policy was approved by the Council of Ministers in 2008 and endorsed by a cross-party commission in 2010. The policy, which was formulated by consensus between all public actors in the sector, provides strategic guidelines, goals and lines of action for achieving the 2030 goals. It also establishes a diagnostic and evaluation mechanism to analyse the energy situation in the country and the world. The objective of the policy is to diversify the country's energy mix and increase the percentage of electricity generated from renewable sources. The main actor involved in implementing the policy has been the State-owned enterprise Administración Nacional de Usinas y Transmisiones Eléctricas (UTE), which began to contract power from renewable sources by means of renewable energy procurement contracts with the private sector in accordance with Decree No. 77/006. Today, Uruguay invests about 3% of GDP in energy infrastructure and exports energy to Argentina and Brazil.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Latin American Energy Organization (OLADE), *Panorama energético de América Latina y el Caribe 2022*, Quito, 2022, and Ministry of Industry, Energy and Mining, "Política energética", 2008 [online] <https://www.eficienciaenergetica.gub.uy/politica-energetica>.

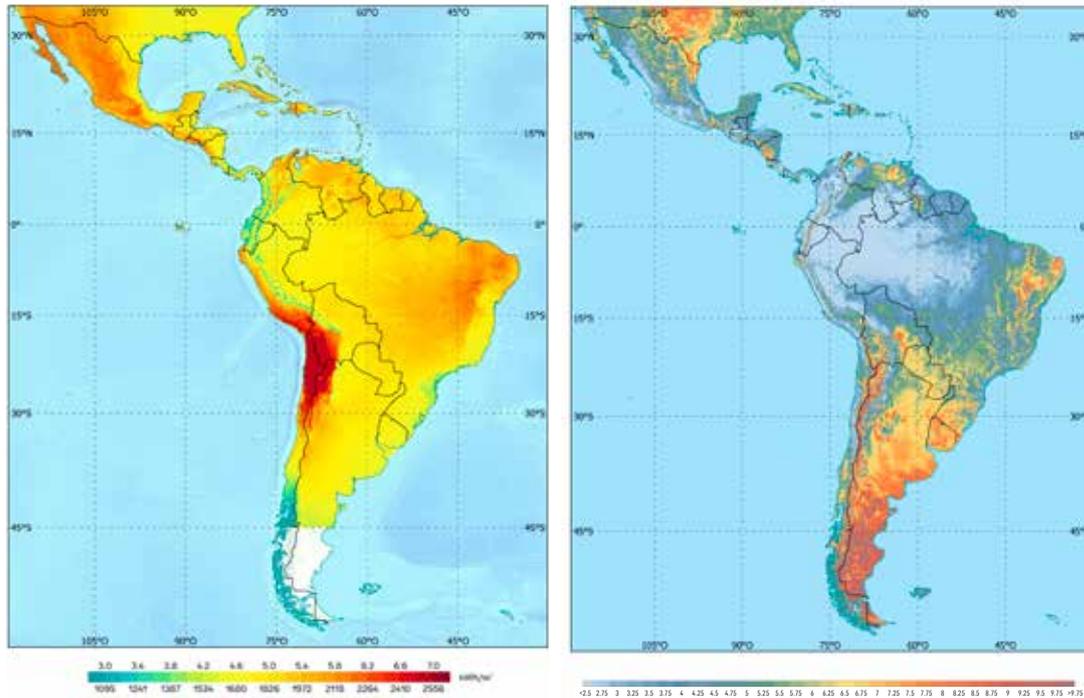
The electricity subsector can be the driver of the region's energy transition: in 2021, 59% of electricity on average was generated from renewable sources, although there were large subregional differences. Diversifying electricity generation sources would have a multiplier effect in the region's green energy transition and make it possible to electrify the transport sector, which is responsible for 13.4% of South America's emissions, 11.1% of the Caribbean's and 21.4% of Central America's (OECD and others, 2022).

Latin America and the Caribbean is in a particularly strong position to carry through the energy transition, as it has exceptional renewable resources (see map III.1). Throughout the region, extraordinary resources are available for hydropower and bioenergy production. In Chile, Argentina, Brazil and Mexico, for example, there is great potential for producing solar and wind energy. Chile, in particular, has the world's largest wind generation potential and one of the highest levels of horizontal irradiation. The mountains of Central America have characteristics that are essential for the production of geothermal energy (UNEP, 2020b). In addition, the region has large reserves of some minerals that are essential for the energy transition, enabling it to position itself strategically in the value chain. In 2017, 61% of world lithium reserves, 39% of copper reserves and 32% of nickel and silver reserves were in Latin America and the Caribbean.

Investing in the energy transition in the countries of Latin America and the Caribbean can represent an opportunity to move towards more sustainable development models. Renewables can cut the cost of supplying energy, increase energy efficiency and reduce countries' vulnerability to fluctuations in the prices of imported fossil fuels. Countries currently dependent on fossil fuels need to put in place investment strategies to make the transition to renewable energy sources. Similarly, countries that rely heavily on hydropower generation must reduce their dependence on water sources and diversify the mix out to other renewable energy sources to minimize the impact that droughts can have on power generation (IEA, 2021a; OLADE, 2017; World Bank, 2017; Ubierna, Alberti and Alarcón, 2020). Changes in rainfall intensity reduce the potential for hydropower to supply the region's energy demand. Dependence on hydropower sources could increase energy vulnerability and economic costs. In addition, more than 50% of the region's installed hydropower capacity is more than 30 years old and highly exposed to the consequences of climate change (IEA, 2021a). It is therefore essential to mobilize investments with a view to modernizing hydropower infrastructure, planning for climate change impacts on the various energy sources and diversifying energy mixes by expanding solar and wind generation capacity.

Map III.1

Latin America and the Caribbean: current photovoltaic and wind power potential, 2023



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of World Bank/Solargis, “Global Solar Atlas”, 2023 [online] <https://globalsolaratlas.info/map>, and J. Badger and others, “Global Wind Atlas”, 2023 [online] <https://globalwindatlas.info>.

The availability of clean, cheap energy could represent an opportunity to diversify the region’s production mix. In particular, the region’s great potential for clean power generation could be harnessed to develop capacity in energy-intensive activities, such as green hydrogen. If there were a growing supply of clean energy accompanied by energy planning and capacity-building strategies, the region could become an attractive location for international investment and, in particular, for the relocation of energy-intensive industries (Hausmann, 2021).

In an energy transition scenario, electricity demand in the region is projected to increase by between 210% and 560% by 2050 (IDB/DDPLAC, 2019). Coping with such a large increase will require growth in renewable energy generation capacity and the implementation of energy planning strategies to mobilize the necessary resources.

Progress with the energy transition will require investment of 1.3% of the region’s annual GDP over the next 10 years to introduce renewable energies, universalize energy access and enhance regional electricity integration (ECLAC, 2020). A regionwide electricity market is essential for increasing the region’s energy security and leveraging scale to coordinate investments in distribution and storage technologies.

The countries of the region are making progress in implementing policies and incentive programmes to accelerate the green transition. Member States of the Caribbean Community (CARICOM), for example, have developed a plan to achieve 47% renewables penetration in electricity generation by 2027. Similarly, the member countries of the Renewables in Latin America and the Caribbean (RELAC) initiative have voluntarily agreed to pursue a strategy to promote renewables in the region with the

objective of bringing their share of the energy mix up to 70% by 2030. The strategy aims to accelerate the move towards carbon neutrality in electricity systems, increase the resilience and competitiveness of the sector, create green jobs and improve air quality (RELAC, 2023). Lastly, the Central American countries have been working to create a market for electricity produced from renewable sources called the Clean Energy Corridor of Central America (CECCA).

While the countries are making progress in meeting nationally determined commitments, they face the challenge of mobilizing resources for the energy transition. The United Nations Environment Programme (UNEP, 2020b) estimates that to meet mitigation needs and achieve the 1.5 °C target, an eightfold increase in investment for the green transition is required in the region. Financing this transition requires coordinated strategies to direct public and private investment efforts towards it. In this context, it is important for FDI to contribute to the goals of the energy transition. It is also important to create policy frameworks and instruments for attracting high-quality investments in order to develop capabilities in sectors related to the energy transition.

D. Renewable energy foreign direct investment in the region: dominated by two technologies in three countries

The renewable energy sector has been among those attracting the most investment in the region, ranking third by the amounts announced. In the period 2005–2022, there were more than 800 FDI project announcements involving this sector in the region, worth a total of almost US\$ 170 billion (see figure III.17). Between 2010 and 2021, announced investments in clean energy surpassed investment in fossil energy, and it has become one of the sectors attracting most FDI announcements in the region.

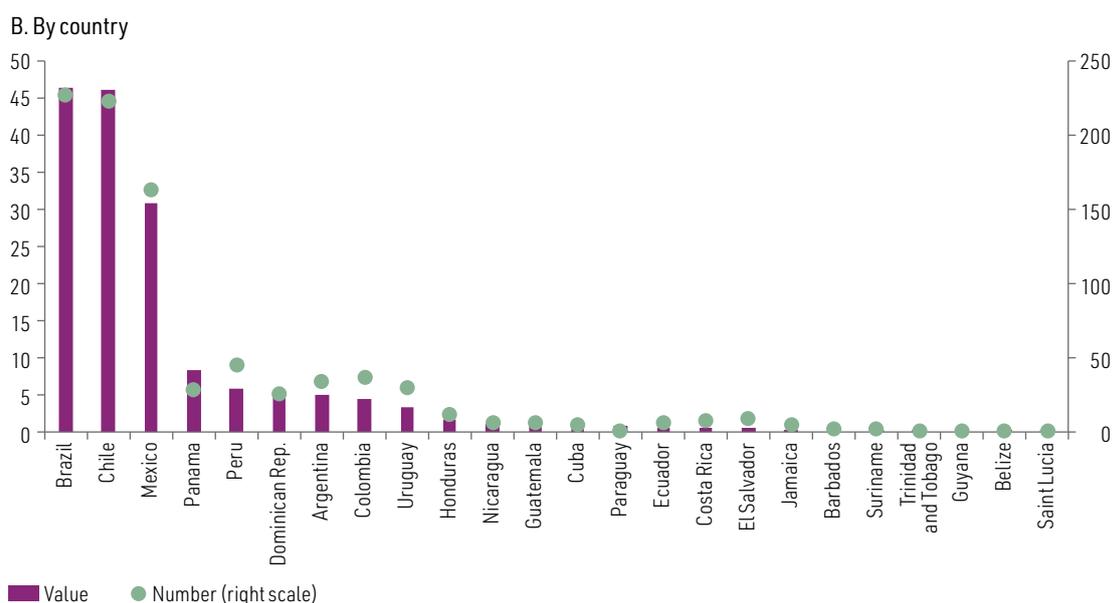
Figure III.17

Latin America and the Caribbean (24 countries): renewable energy investment project announcements, 2005–2022

(Billions of dollars and numbers)

A. Whole region





Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

While Brazil, Chile, Mexico, Peru and Colombia have been the main destination countries, attracting between them more than 80% of all FDI announced in the region, FDI has undergone a reconfiguration in most countries and been directed towards renewable energy.¹⁴

Since 2009, in the wake of the global financial crisis and the decline in the profitability of new renewable energy projects in European markets, Latin America and the Caribbean has become a key destination for European Union investments in this type of energy, particularly those from France, Spain and Italy. Companies from European Union countries were responsible for 63% of all renewable energy FDI projects announced in the region between 2005 and 2022. European capital inflows contributed to the dynamism of renewable energy markets and supported the energy transition in the Latin American and Caribbean countries. The main investors were Enel of Italy, which announced 99 projects worth US\$ 16.8 billion, Iberdrola of Spain and Engie of France (see table III.3). The three companies were responsible for about 18% of all FDI projects announced for the region.

Table III.3

Latin America and the Caribbean: top three renewable energy investors, 2005–2022

	Total value of announced investments (Millions of dollars)	Project announcements (Number)	Average project value (Millions of dollars)	Country of origin
Enel	16 789	99	170	Italy
Iberdrola	7 243	23	315	Spain
Engie	6 794	37	184	France

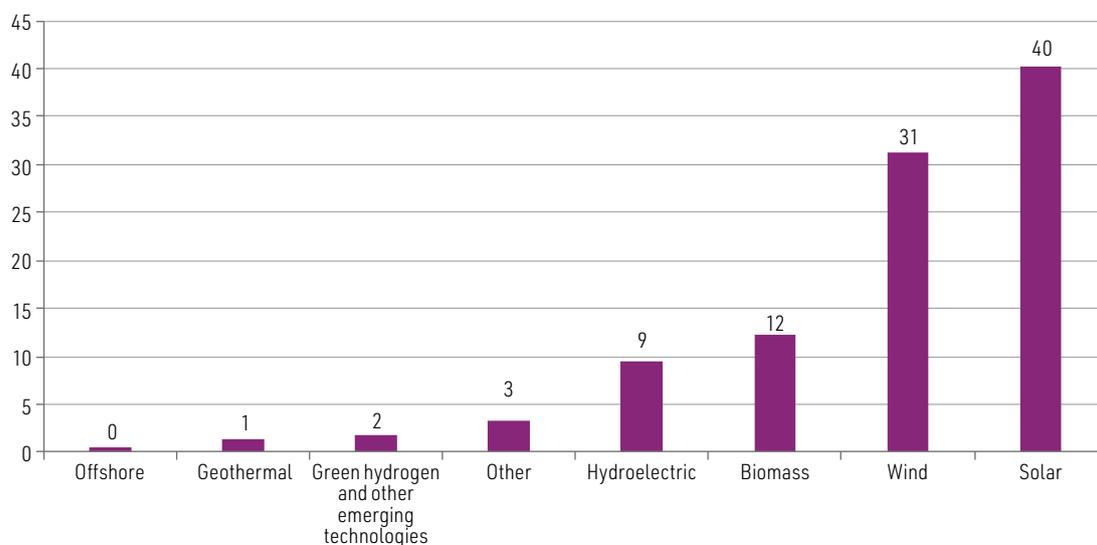
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

In line with the global trend, solar and wind technologies attracted the largest number of FDI projects and accounted for more than 70% of all investment in renewable energies (see figure III.18).

¹⁴ Information on energy-related FDI announcements is available for 24 countries of the region, in 15 of which over 50% of this investment has been in renewable energy.

Figure III.18

Latin America and the Caribbean (24 countries):^a value of renewable energy investment project announcements as a proportion of the total, by technology, 2005–2022
(Percentages)



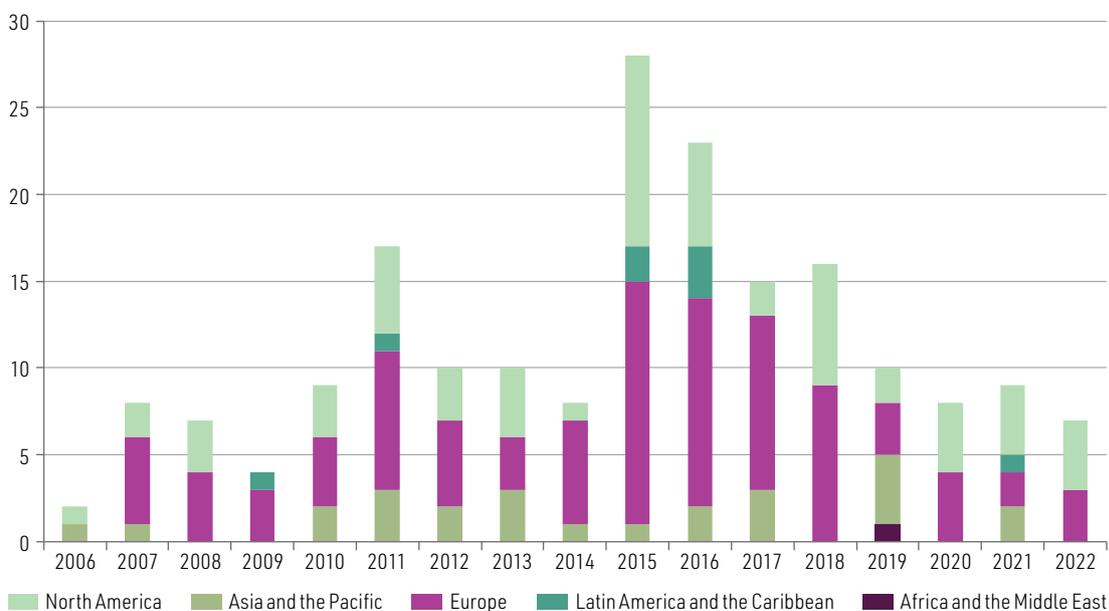
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times fDi Markets.
^a The countries covered are: Argentina, Barbados, Belize, Brazil, Chile, Colombia, Costa Rica, Cuba, the Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Lucia, Suriname, Trinidad and Tobago and Uruguay.

Renewable energy investment announcements peaked in 2019 at more than 120 projects totalling US\$ 20.5 billion. Since the COVID-19 pandemic, there has been a marked slowdown caused by two main factors: the rising cost of capital to implement solar and wind projects, and the reshaping of the energy agenda in Europe and the United States. In 2022, renewable energy project announcements rebounded, growing by 30% over 2021, with 37 projects worth a total of US\$ 10.4 billion announced. Importantly, more than 50% of investment was in emerging technologies that year; in particular, 27% was for the development of advanced biofuels and 25% for the implementation of hydrogen projects and green technologies.¹⁵ The vigour of the Latin American market has been reflected in the dynamics of cross-border mergers and acquisitions. Although those involving renewables still lag behind those involving fossil energy, since 2010 there has been a rise in interest from transnational companies in renewable assets in the countries of the region. Of the transactions completed, 50% have involved an acquirer from Europe, 33% one from North America and 13% one from Asia and the Pacific, while just 4% have been intraregional (see figure III.19).

¹⁵ SGP BioEnergy of the United States has announced the construction of the world's largest advanced biofuels plant in Panama. The project, which will be carried out in cooperation with the Government of Panama and Panama Oil Terminals, is to include a biofuel refinery, a distribution facility and a plant for the production of green hydrogen from residual carbon and by-products of the refining process. Of particular interest too is the announcement of renewable energy and sustainable mobility projects by InterEnergy Holdings and the Punta Cana-Macao Energy Consortium in the Dominican Republic. InterEnergy is one of the main developers of renewable energies in the region, and at the twenty-seventh session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP27) it announced the signing of an agreement with Bank of America to finance renewable energy projects. The agreement provides for the creation of a warehouse financing facility involving multiple assets in various jurisdictions to support the financing of the InterEnergy project portfolio. A portion of the financing will be used to implement projects in Caribbean small island developing States (SIDS).

Figure III.19

Latin America and the Caribbean: cross-border renewable energy mergers and acquisitions, by region of origin, 2006–2022
(Numbers)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

It has been established that there were 191 cross-border mergers and acquisitions involving the purchase of renewable energy assets in the region between 2005 and 2022. Brazil was the main destination, with 89 deals concluded, followed by Chile with 42 and Mexico with 26. Two phases can be distinguished in the period, the first from 2005 to 2014, when the region was the destination for an average of 8 transactions per year, and the second from 2015 to 2022, when the average was 15 transactions per year. While information on transaction amounts is unavailable in more than 60% of cases, an analysis of the average size of transactions whose value is known reveals that deals involving renewable energy assets since 2014 have been larger than those that took place in the first half of the 2000s. Importantly, 24% have involved the acquisition not of power generation companies but of assets used specifically for power generation, such as solar farms, hydroelectric power plants and wind farms.

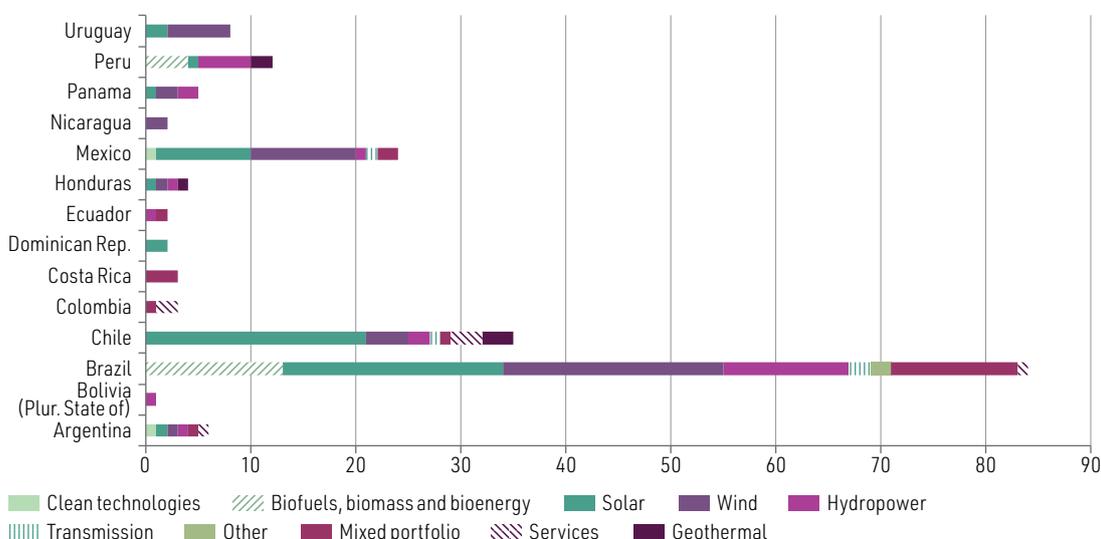
The interest of international investors in the different renewable technologies has varied with the evolution of these technologies in international markets and the level of maturity of energy markets in the Latin American and Caribbean countries.

Solar and wind assets have dominated mergers and acquisitions, accounting on average for more than 50% of all deals, followed by assets used to generate hydropower (13%) and projects involving mixed portfolios (11%). Between 2006 and 2009, assets related to bioenergy and biofuels accounted for almost 40% of mergers and acquisitions, while between 2010 and 2013 wind energy deals accounted for 30%. Since 2014, solar assets in Chile, Brazil and Mexico have been at the forefront of merger and acquisition activity, accounting for almost 40% of all transactions (see figure III.20). It has been possible to identify seven cross-border asset acquisition deals in the renewable energy sector in 2022, with four involving solar, two hydropower and one wind power generation assets.

Figure III.20

Latin America and the Caribbean (14 countries): cross-border renewable energy mergers and acquisitions, by technology, 2005–2021

(Numbers)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

The dynamics of renewable energy FDI in the region have been driven by falling technology prices, the great renewable resource potential of the region's countries and policy initiatives implemented to create a stable and competitive investment environment. Most countries now offer tax incentives for investment, some of a general character and others specifically aimed at promoting renewable energies. These incentives consist mainly of accelerated depreciation schemes, special deductions and tax credits applied to income tax when project investments are made, as well as exemptions or reduced rates applied mainly to value added tax (VAT) and import tariffs on the purchase of machinery, equipment and other inputs needed to implement investment projects. At the same time, mechanisms such as auctions, differential tariffs and net metering have been used in most of the countries to attract international investment and, in particular, to encourage the implementation of new projects.

While the sector has grown steadily and the region now has one of the cleanest energy mixes in the world, major financing needs will have to be met if the energy transition in the Latin American and Caribbean countries is to advance. Given that there is little fiscal space in the region's countries to increase investment in renewable energy on the scale needed to achieve the energy transition, it is essential for governments to have the right policies and instruments in place to attract private investment from the region and the world. According to IRENA (2021), investment in the sector will need to double by 2030 and then grow yet further to three times current levels if the goals set are to be achieved. FDI can play a key role in catalysing investments in frontier technologies that contribute to the energy transition in the countries of Latin America and the Caribbean.

1. Solar energy

Between 2005 and 2022, solar energy was the main driver of renewable energy investment in Latin America and the Caribbean, with 408 FDI project announcements totalling US\$ 66.3 billion. The region was the third largest destination after Europe and Asia and the Pacific in the period, receiving

15% of all investment in the sector. Solar power FDI announcements grew steadily from 2008 up to and including 2019, when 76 projects totalling US\$ 11.8 billion were announced (see figure III.21). From 2020 onward, there was a steady decline in the number and total value of FDI announcements, with an average of US\$ 5 billion between that year and 2022, leaving them at 2013 levels. The decline in solar energy FDI announcements was mainly driven by global market dynamics. Between 2020 and 2022, Latin America and the Caribbean was the destination for 12% of all investment in the sector.

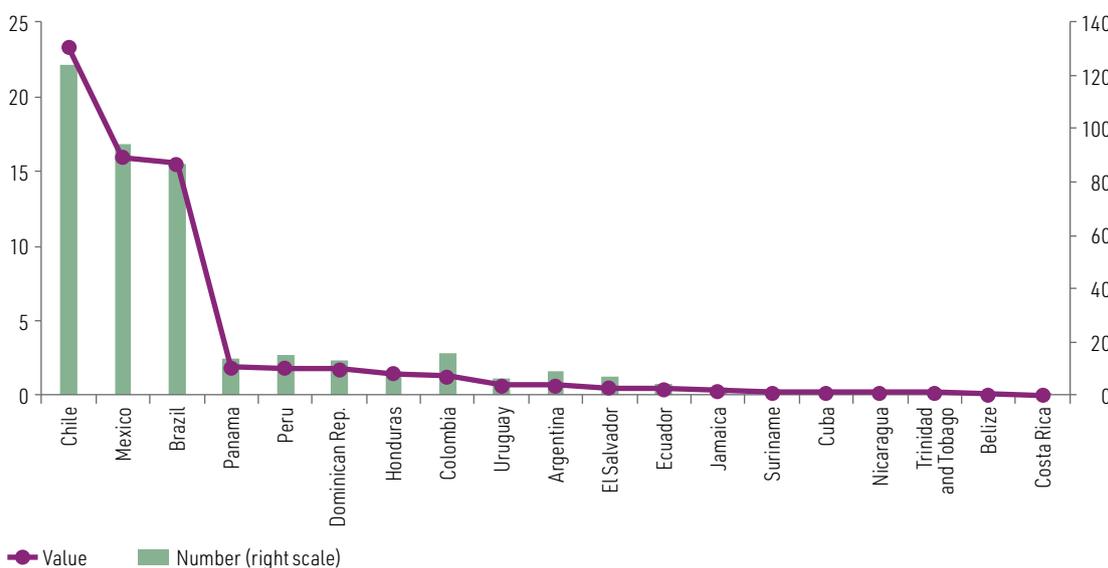
Figure III.21

Latin America and the Caribbean (19 countries): solar energy investment project announcements, 2008–2022
(Billions of dollars and numbers)

A. Whole region



B. By country



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

Chile was the leading destination country in the region between 2005 and 2022, with 124 project announcements worth a total of more than US\$ 23 billion. It was followed by Mexico and Brazil, which received US\$ 16 billion and US\$ 15 billion, respectively. The three countries accounted for 82% of all announcements in the region during the period. Panama ranked fourth by the amount of investment, attracting 14 projects worth almost US\$ 2 billion.

The European Union originated 64% of announcements, followed by North America (19%) and the rest of Europe (7%). At the country level, Spain was the leading investor, announcing 121 projects worth a total of US\$ 21 billion (see table III.4). Of companies, Italy's Enel was the largest investor, announcing 43 projects worth almost US\$ 6 billion, followed by Spain's Abengoa with 5 projects worth US\$ 4.3 billion and Canadian Solar Inc. with 18 projects worth US\$ 3 billion.

Table III.4

Latin America and the Caribbean: leading countries for solar energy investment, 2005–2022

Country of origin	Value (Millions of dollars)	Projects (Number)
Spain	21 015	121
United States	8 272	45
Italy	6 815	50
France	5 310	41
Canada	4 443	26
United Kingdom	3 048	16
Germany	2 319	12
Czech Republic	1 714	11
China	1 534	10
Chile	1 286	10
Total	66 329	408

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

The largest project was announced in 2015 by Spain's Abengoa: it was worth US\$ 2.2 billion and entailed the construction of a 315 MW concentrated solar power plant. Chile was one of the top 10 investor countries between 2005 and 2022, announcing 10 projects worth US\$ 1.3 billion in the region. All the Chilean projects were announced by Atlas Renewable Energy between 2017 and 2020, and the main destinations were Brazil, Mexico and Uruguay.

Like project announcements, mergers and acquisitions in the solar sector were mainly concentrated in Brazil, Chile and Mexico. Of the 60 deals between 2005 and 2022, 22 involved the purchase of assets in Brazil, 21 in Chile and 9 in Mexico. In the five largest deals, four companies from Europe and one from the United States bought solar generation assets worth a total of US\$ 1.3 billion (see table III.5). Only four deals were registered in 2022. Canada's Innergex purchased the 50.6 MW San Andrés solar farm in the Atacama region of Chile for US\$ 25.7 million. The company plans to build a battery energy storage system at the farm. In Mexico, MPC Energy Solutions of the Netherlands bought the Los Santos Solar I project, which has a capacity of 15.8 MWp and is located in the state of Chihuahua. Lastly, there were two deals in the Dominican Republic: the purchase of a 32 MWdc solar generation project by Canada's Polaris Infrastructure, and the purchase of the 33.4 MWp Monte Plata solar farm by the MPC Caribbean Clean Energy Fund.

Enabling policies have played a decisive role in the evolution of solar energy FDI. Policy instruments including auctions, incentives and solar energy portfolio requirements have contributed to a significant reduction in the cost of implementing solar projects and an increase in the profitability of investments. Similarly, the creation of sound regulatory frameworks has facilitated the entry of international investors into the region's markets. Since the mid-2000s, policies and measures to promote non-conventional energy generation have been implemented in many countries of Latin America and the Caribbean. In the case of photovoltaic solar energy, Chile's experience has been of particular interest (see box III.5).

Table III.5

Latin America and the Caribbean: largest solar energy mergers and acquisitions, 2005–2022

Asset acquired	Buyer	Year	Amount paid (Millions of dollars)	Investing country	Country of the asset
Solar photovoltaic assets (578 MW)	Actis	2017	525	United Kingdom	Brazil
Photovoltaic plant in Aguascalientes (Mexico)	Cubico Sustainable Investments Ltd.	2016	275	United Kingdom	Mexico
Actis El Pelicano Solar Company photovoltaic plant	SunPower Corporation	2016	212	United States	Chile
Kroma Energía Apodi photovoltaic portfolio	Scatec Solar ASA	2016	211	Norway	Brazil
Portfolio of 100 MW of solar projects	Reden Solar SAS	2019	96.4	France	Chile

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

Box III.5

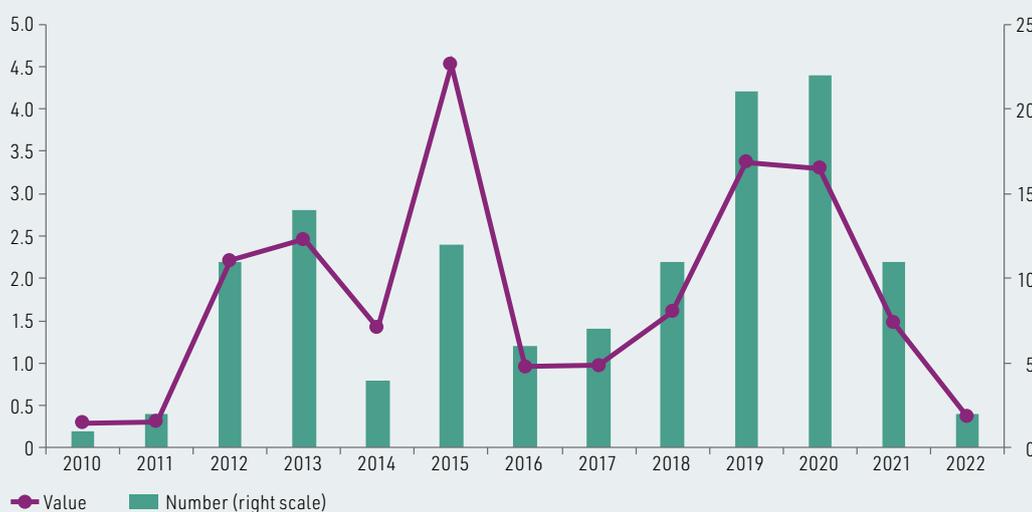
Solar photovoltaic energy in Chile

The development of the solar energy sector in Chile is relatively recent. In 2005, there was no capacity to generate this type of energy in the country. By 2014, photovoltaic energy accounted for 1% of all generation, and by 2022, for 16%. Within the general framework of a national inward investment and capacity-building strategy (Guimón and others, 2018), initiatives aimed at accelerating the growth of the renewable energy sector, and solar energy in particular, began to be implemented in the first half of the 2000s.

Foreign investment has played a key role in the strategies pursued and contributed significantly to the development of the sector. Since 2004, Law No. 19940, known as the Short Law I, has allowed new entrants into the energy market and provided non-discriminatory access to large-scale renewable energies and small generating facilities. In 2008, Law No. 20257 was passed, requiring energy companies to offer end customers certain minimum quotas of non-conventional energy. This was updated in 2013 by Law No. 20698 setting targets for renewable energy generation by 2025. At the same time, an auction mechanism and a series of tax incentives were designed for the implementation of solar energy projects, such as exemption from value added tax (VAT) on imports of capital goods and concessions of State-owned land for project implementation. In 2014, net billing was introduced to promote the creation of decentralized solutions. This mechanism, which was updated in 2018, gives regulated customers the option of feeding the energy they generate into the system and deducting it from their consumption. In 2015, the Energy 2050 long-term strategy was presented, introducing explicit targets and policies for the development of the solar sector and facilitating medium-term domestic and international investment. In particular, it created mechanisms to make solar project tendering more flexible, improved energy supply mechanisms, provided the option for generators to choose eight-hour time slots for generating electricity from renewable energy sources, guaranteed public procurement tender prices for a period of 15 or 20 years, and improved transmission and concession laws (Nasirov and others, 2019). In parallel, Chile has launched initiatives to develop production capacities throughout the solar sector chain, promoting synergies with demand from the mining sector and the service sector (Zurita and others, 2018; Saporito and others, 2021).

In a global context characterized by falling prices for photovoltaic technologies, Chile has been one of the main destinations for FDI announcements in the solar sector since 2012. Between 2010 and 2022, 124 FDI projects totalling more than US\$ 23 billion were announced for the country. Investments were concentrated in a few regions, with 60% of projects being for Antofagasta and Atacama, the two regions with the highest solar irradiation. While investments over the decade came from 17 countries and 49 companies, Spain was the largest investor and Abengoa the leading company, announcing investments worth US\$ 4.4 billion.

Chile: solar energy foreign direct investment project announcements, 2010–2022
(Billions of dollars and numbers)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

Chile: largest solar energy investment project announcements, 2010–2022

Year	Company	Country of origin	Destination region for the investment	Capital (Millions of dollars)
2015	Abengoa Solar Chile	Spain	Atacama	2 200
2013	Abengoa Solar Chile	Spain	Antofagasta	1 061.48
2014	Abengoa	Spain	Antofagasta	750

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

In 2022, Chile's National Energy Commission (CNE) announced that a tender for 777 GWh/a of new supply from 2027 had been awarded. Part of the tender was awarded to the Chinese company Canadian Solar, which has announced that in 2023 it will start work on the Zaldívar project, located in the Antofagasta region, which is expected to involve the installation of 253 MWP of solar power generation and 1,000 MWh of battery energy storage.

Chile's public policies have become a benchmark for the development of the solar power generating sector globally. Growth and foreign investment in the sector are expected to accelerate again after 2022. As part of its recovery strategies, the government has announced new energy transition goals and pursued programmes aimed at increasing distributed generation capacity. With a well-developed regulatory framework in place and new photovoltaic capacity being added every year, Chile is on track to meet its 2025 targets.

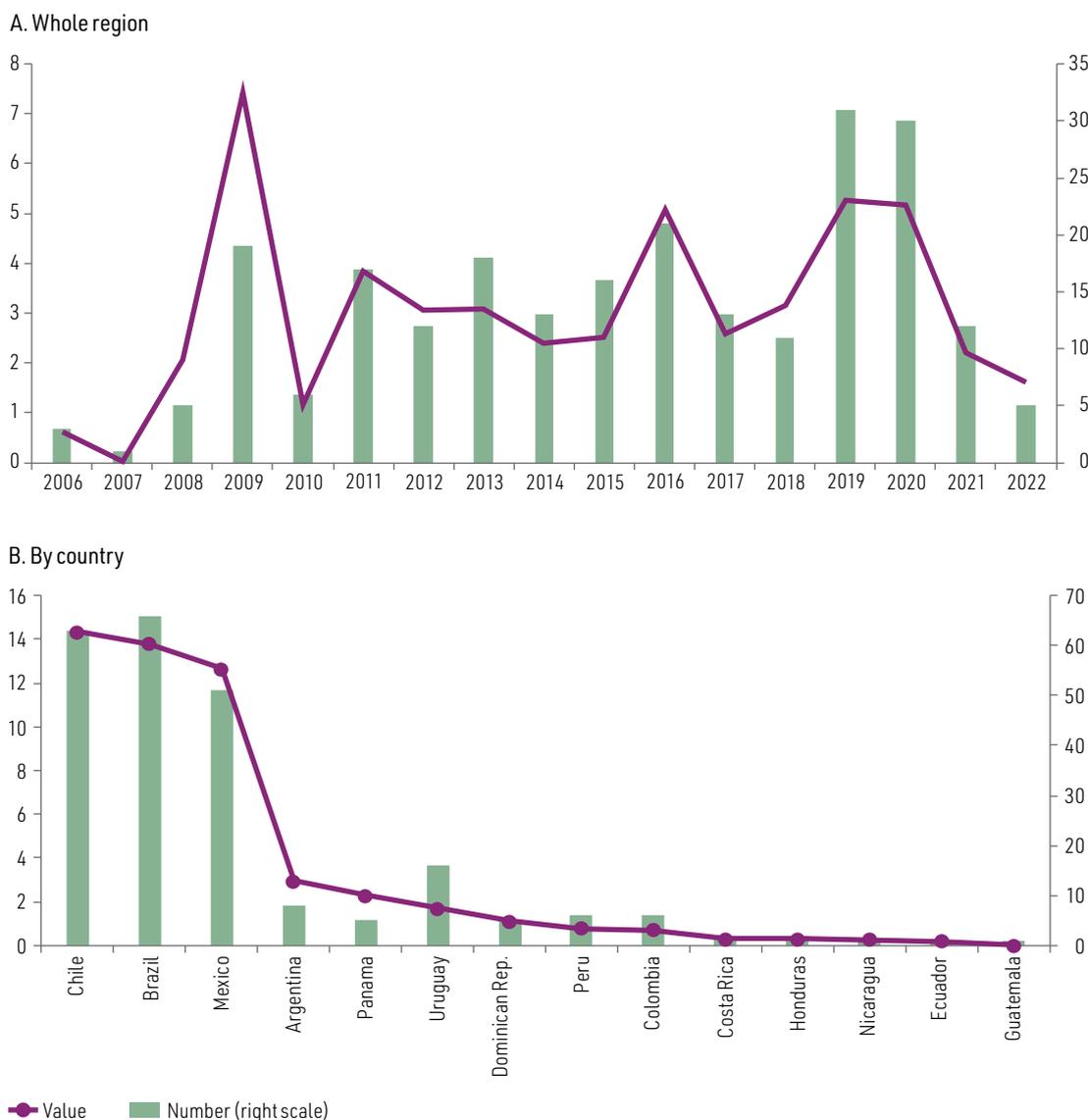
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of J. Guimón and others, "Policies to attract R&D-related FDI in small emerging countries: aligning incentives with local linkages and absorptive capacities in Chile", *Journal of International Management*, vol. 24, No. 2, June 2018; S. Nasirov and others, "Policy makers' perspectives on the expansion of renewable energy sources in Chile's electricity auctions", *Energies*, vol. 12, No. 21, October 2019; A. Zurita and others, "State of the art and future prospects for solar PV development in Chile", *Renewable and Sustainable Energy Reviews*, vol. 92, September 2018; N. Saporito and others, *Upgrading Institutional Capacities in Innovation Policy in Chile: Choices, Design, and Assessments*, Washington, D.C., Inter-American Development Bank (IDB), 2021; and A. Podestá and others, "Políticas de atracción de inversiones para el financiamiento de la energía limpia en América Latina", *Project Documents* (LC/TS.2022/116), Santiago, ECLAC, 2022.

2. Wind energy

Between 2005 and 2022, the wind power generation sector was one of the most dynamic in terms of attracting investment, with 233 projects worth a total of US\$ 51.3 billion announced in Latin America and the Caribbean. After 2009, when investments worth US\$ 7 billion were announced, FDI announcements in this sector held steady at an average of about US\$ 3.5 billion per year. The number of announcements had been rising before the crisis caused by the pandemic, peaking in 2019 at 31 projects worth a total of US\$ 5.3 billion. In 2021, however, the impact of the pandemic and the crisis in energy markets led to a 57% drop in project announcements, and 2022 saw the fewest in a decade: five projects worth US\$ 1.6 billion (see figure III.22).

Figure III.22

Latin America and the Caribbean (14 countries): wind energy project announcements, 2006–2022
(Billions of dollars and numbers)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

Investments were concentrated in Chile, Brazil and Mexico, which together received 80% of the total. As for the other countries in the region, Colombia showed particular dynamism between 2019 and 2021, attracting projects worth US\$ 600 million. Some 80% of the investments made in the sector came from the European Union, followed by North America (8%), other European countries (6%) and Asia and the Pacific (4%). Only 2% of all the projects announced originated from the countries of the region.

Investor countries were led by Spain, which announced 59 projects worth a total of US\$ 17 billion, followed by Italy (US\$ 7.6 billion) and France (US\$ 6.4 billion) (see table III.6). Brazil was the leading investor from the region, announcing three investments in Chile and one in Uruguay worth a total of US\$ 770 million, followed by Argentina, which in 2013 announced two projects in Uruguay to build and expand a wind farm, and Colombia, which in 2014 announced a US\$ 200 million project to build a wind farm in Chile.

Table III.6

Countries originating the largest investments in wind energy, 2005–2022

Investing country	Capital invested (Millions of dollars)	Projects (Number)
United Kingdom	1 045	6
Australia	1 264	3
Portugal	1 424	11
Norway	1 625	8
United States	3 679	16
Ireland	3 745	11
Germany	4 657	26
France	6 425	34
Italy	7 663	39
Spain	16 798	59

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

In 2009, Guascor Group from the Basque Country announced the building in Argentina of what would become the world's largest wind farm, with a capacity of between 600 MW and 900 MW, for a total investment of US\$ 2.4 billion.

In contrast to the dynamism of FDI project announcements, mergers and acquisitions in the sector were rare. Between 2007 and 2022, there were 48 recorded deals involving the purchase of wind generation assets in the countries of the region. The destination country for the largest number of deals was Brazil, with 21 cross-border mergers and acquisitions, followed by Mexico with 11 and Uruguay with 6. Companies from the United States, the United Kingdom and Spain were the main investors, accounting for 73% of all deals. The United States and the United Kingdom carried out the largest transactions in the region (see table III.7). The largest recorded between 2007 and 2022 was the purchase of the Casa dos Ventos wind farm complex in Brazil by Cubico Sustainable Investments Ltd.

At the intraregional level, there were no reported mergers and acquisitions between companies in the region, and the only two transactions recorded were carried out by multinational companies with assets in the region: in one, Enel bought assets with a capacity of 90 MW in the Cristalândia wind project in Brazil, and in the other, InterEnergy Holdings, which operates in the Dominican Republic, purchased a 15 MW portfolio in Chile.

Table III.7

Main wind energy mergers and acquisitions, 2005–2022

Asset acquired	Buyer	Year	Amount paid (Millions of dollars)	Investing country	Country of the asset
Wind assets with a capacity of 392 MW	Cubico Sustainable Investments Ltd.	2016	494	United Kingdom	Brazil
Fourteen wind projects in Brazil	TerraForm Global, Inc.	2015	485	United States	Brazil
Operative onshore wind project in Brazil with a capacity of 137 MW	Actis	2020	325	United Kingdom	Brazil
Desarrollos Eólicos Mexicanos de Oaxaca 1 SA de CV	First Reserve Corporation	2013	244	United States	Mexico

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Bloomberg.

As with solar energy, public policy initiatives aimed at fostering renewable energy generation have been crucial in promoting wind sector investment in Latin America and the Caribbean. While generic instruments such as auctions, tax incentives, feed-in tariffs and mandatory quotas have been implemented in all countries, few have developed strategic plans specifically aimed at encouraging the wind power generation sector. Auctions have been the most widely used policy tool at the regional level and have allowed the sector to grow rapidly. Uruguay is a case in point, holding five auctions to award wind generation capacity, with the result that the sector developed quickly and the country came to have one of the highest percentages of wind power in its energy mix (Ruiz Campillo, 2017). In Brazil and Panama, too, tenders have been held specifically for wind power generation (see box III.6 for information on Brazil).

Box III.6

Wind energy in Brazil

The wind generation sector in Brazil began to develop in the early 2000s as a result of a series of energy crises. The country's energy mix was dominated by hydropower, and after a number of years in which generating capacity was below par, a strategy was put in place to diversify energy generation sources. The 2002 provisions to diversify the electricity mix were the first milestone in the opening up of Brazil's wind sector to the global market. In the first Alternative Sources of Energy Incentive Programme (PROINFA), 300 MW were tendered under a preferential tariff system, and this capacity was distributed equally between wind, biomass and small-scale hydropower (Herrera, Cosenz and Dyer, 2019).

In 2008, the country implemented a system of auctions with strict eligibility criteria that enabled the industry to develop. The first auction exclusively for wind energy took place in 2009, tendering 1.8 GW of projects to be implemented by 2012. In 2010, the Ministry of Mines and Energy tendered other technology-neutral concessions. All auctions prohibited the import of wind turbines with a rated capacity of less than 1.5 MW and included a local content requirement (Herrera, Cosenz and Dyer, 2019). At the same time, initiatives aimed at creating efficient local production chains were designed and credits from the National Bank for Economic and Social Development (BNDES) were offered to those carrying out development activities in the sector. Brazil is now home to wind turbine producers, companies specializing in the manufacture of turbine blades and towers, companies working with other components, and transport, planning and service companies. Local capacity-building has been essential to create jobs and reduce the cost of implementing wind projects in the country.

The first foreign direct investment (FDI) projects in Brazil were announced in 2010. Spain's Iberdrola and Elecnor announced two projects worth US\$ 178 million and US\$ 142 million, respectively. Wind power FDI announcements grew moderately from 2010 until before the pandemic, and 29 projects worth a total of US\$ 5.7 billion were announced between 2019 and 2020.

Brazil: wind energy foreign direct investment project announcements, 2010–2022
(Billions of dollars and numbers)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

A total of 67 FDI projects worth US\$ 13.7 billion were announced in the wind generation sector between 2010 and 2022. The main investors were companies from Italy and France, which announced investments totalling US\$ 7 billion. Italy's Enel, in particular, announced 14 projects worth US\$ 3 billion. The main investments took place between 2018 and 2020 (see table).

Brazil: largest wind energy investment project announcements, 2010–2022

Year	Company	Country	State	Value (Millions of dollars)
2018	Iberdrola	Spain	Rio Grande do Norte	833
2020	Enel Brasil Participações	Italy	Piauí	811
2020	Statkraft	Norway	Bahia	442

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

Geographically, wind energy investments are extremely concentrated. Three states, Rio Grande do Norte, Bahia and Piauí, have attracted 75% of the sector's projects.

Brazil ranks eighth in the world for installed capacity, with 14.5 GW (IRENA, 2023). Furthermore, in 2021 it ranked third for the installation of new wind power capacity, behind China and the United States (GWEC, 2022). In 2022, regulations for the development of offshore wind energy projects started to be designed. It is estimated that, considering potential technical capacity, Brazil could become one of the main destinations for offshore energy projects. Large companies in the sector have shown increasing interest. According to the Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA, 2023), environmental licence applications totalling more than 176 GW had been filed in Brazil by the end of 2022, with an average capacity of 2.7 GW per project.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of M. M. Herrera, F. Cosenz and I. Dyer, "How to support energy policy coordination? Findings from the Brazilian wind industry", *The Electricity Journal*, vol. 32, No. 8, October 2019; International Renewable Energy Agency (IRENA), *Renewable Capacity Statistics 2023*, Abu Dhabi, 2023; Global Wind Energy Council (GWEC), *Global Wind Report 2022*, Brussels, 2022; and Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA), "Complexos eólicos offshore: projetos com processos de licenciamento ambiental abertos no Ibama", 2023 [online] <https://www.gov.br/ibama/pt-br/assuntos/laf/consultas/mapas-de-projetos-em-licenciamento-complexos-eolicos-offshore>.

The wind generation sector is playing a key role in the energy transition in Latin America and the Caribbean. In 2022, Latin America accounted for 5.7% of all new wind capacity installed globally. While most of the investment attracted up to that year went into onshore wind technologies, there is great potential for offshore projects in the region. According to a study published by the World Bank's Energy Sector Management Assistance Programme (ESMAP, 2019), the Latin American countries with the greatest technical potential for offshore wind power development are Argentina and Brazil, whose generation capacity is estimated at 1.9 TW and 1.3 TW, respectively. International investors have expressed interest in developing offshore wind energy projects in the region. According to the Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA, 2023), planned offshore wind generation projects in Brazil amount to 180 GW, which is four times the current installed wind capacity in the country. The largest project will be the Ventos do Sul wind farm, which will have an installed capacity of 6.5 GW. The first auctions for the development of offshore projects are planned for 2023. The new offshore wind technology cycle is expected to re-energize offshore wind investments in the coming years.

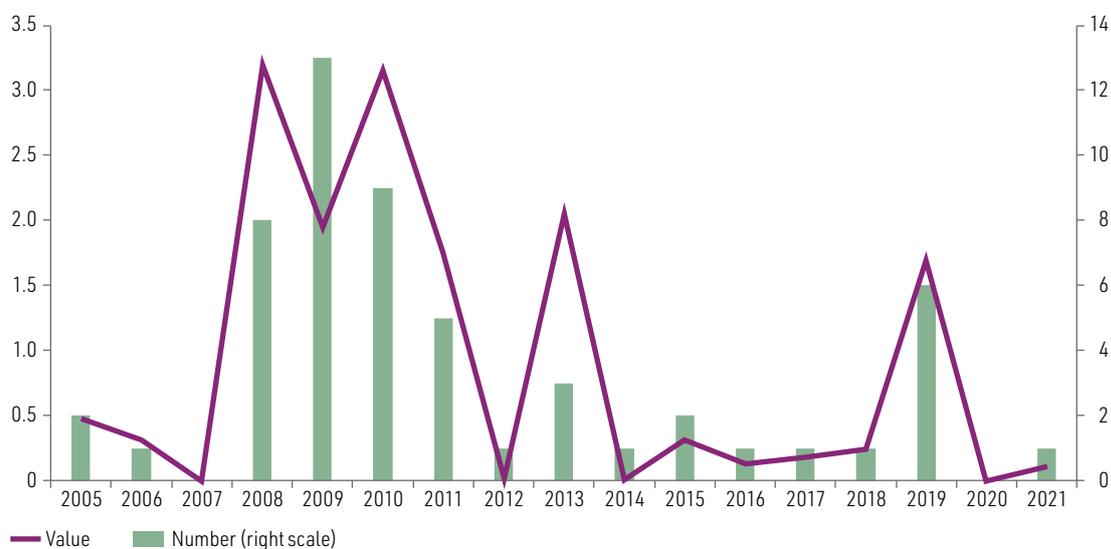
3. Other energy sources: hydropower and biomass

While solar and wind have dominated renewable energy FDI in the region, other renewable sources have played an important role in the energy transition in many countries of Latin America and the Caribbean.

Hydropower, in particular, remains the leading source of renewable energy, accounting for more than 41% of installed capacity. However, FDI announcements have been relatively modest. Between 2005 and 2022, 55 projects worth US\$ 15.5 billion were announced, the bulk of them between 2008 and 2011, when 35 such projects were announced, accounting for 65% of the total by value (see figure III.23).

Figure III.23

Latin America and the Caribbean: hydropower investment project announcements, 2005–2022
(Billions of dollars and numbers)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

Chile, Brazil and Peru were the top three destinations for hydropower FDI between 2005 and 2022, attracting 70% of the projects announced in the region. European Union countries, in particular Spain, Italy and France, were responsible for 57% of the announcements, followed by the United States (13%)

and countries in Latin America and the Caribbean (10%) and Asia and the Pacific (10%). Brazil was the main regional investor, announcing 10 projects worth US\$ 1.5 billion in the period, or 9% of the investment in the region. AES of the United States announced the largest project, which was located in Chile and worth US\$ 1.2 billion.

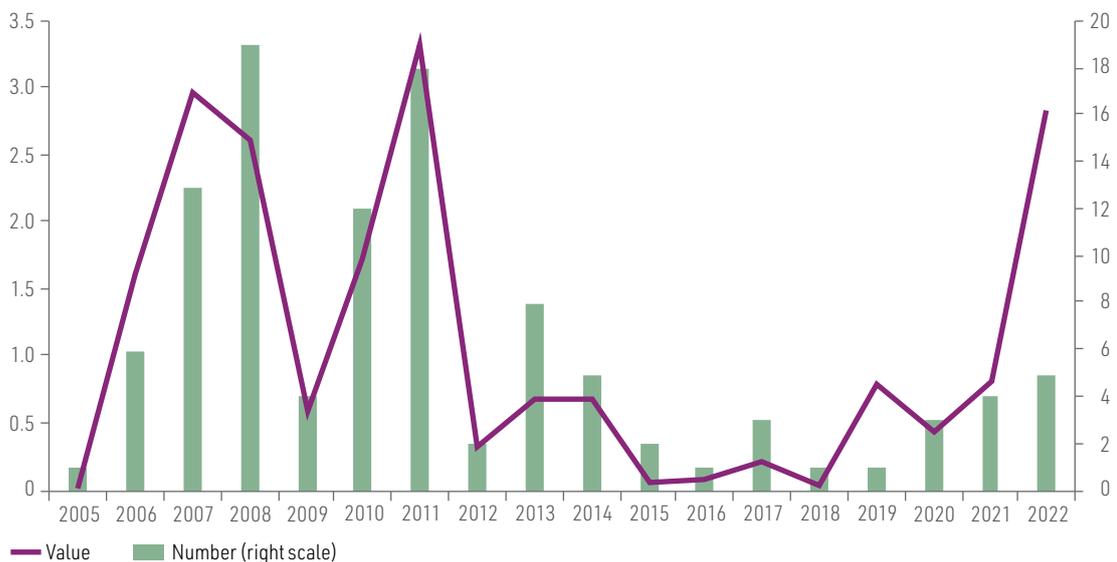
Environmental challenges associated with the development of large-scale hydropower projects and the impact of climate change on hydropower generating potential have reduced investor interest in the sector. Since 2020, there has been only one announcement in the region, by the Spanish group Ecoener in Colombia in 2021.

Bioenergy and biomass development has also played a key role in the energy strategies of some of the region's countries, particularly Brazil, Argentina and Colombia, although its share of FDI announcements is low.

Between 2005 and 2022, 108 biomass and bioenergy FDI projects totalling almost US\$ 20 billion were announced, representing 12% of all renewable energy investment (see figure III.24). Investment in the sector surged between 2007 and 2011, peaking at a total of US\$ 3.3 billion in the latter year. From 2012 to 2021, announcements never exceeded US\$ 1 billion per year, but in 2022, SGP BioEnergy of the United States announced the construction of a biofuel refinery in Panama to produce green hydrogen, which reversed the trend in the sector. The project, worth US\$ 2.5 billion, will be implemented from 2025 and is estimated to have the potential to produce up to 405,000 tons of green hydrogen per year. The Panamanian announcement represented 90% of all investment in the sector in 2022. That year also saw the announcement of a US\$ 290 million project in Brazil and two projects worth US\$ 70 million and US\$ 10 million, respectively, in Argentina.

Figure III.24

Latin America and the Caribbean: biomass and bioenergy investment project announcements, 2005–2022
(Billions of dollars and numbers)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of data from Financial Times, fDi Markets.

Between 2005 and 2022, Brazil was the leading destination for biomass and bioenergy FDI, attracting 47 projects that represented almost 60% of all announcements. Brazil was followed by Argentina with 15 projects and Peru with 9. North America was the leading investor, with 44 projects totalling US\$ 9.4 billion, followed by the European Union, with 43 projects worth US\$ 6 billion.

Other energy sources, in particular offshore and geothermal energy, have together accounted for less than 3% of all announcements in the region. As has been the case globally, green hydrogen and environmental technologies such as battery and storage systems have attracted investor interest in the region in recent years. Between 2018 and 2022, there were 10 project announcements worth a total of US\$ 3 billion. In 2022 alone, six projects with an estimated value of US\$ 2.6 billion were announced. European countries have been the main investors (80% of the total), followed by the United States. While new technologies have attracted substantial announcements, projects are still in the demonstration phase.

E. Policy approaches for promoting renewable energy and attracting foreign direct investment

The urgency of the energy transition and the growing need for investment in the sector call for initiatives to mobilize resources, both domestic and international. In today's regional economic context, characterized by limited fiscal space and low domestic investment, mobilizing international resources to accelerate the energy transition is particularly important. Understanding the factors that influence FDI flows and the policy tools for channelling them into renewable energy is of fundamental importance for policy design.

Investing in renewable technology projects involves high upfront capital costs and a number of risks related to technologies (such as their life cycle, efficiency, price, level of obsolescence and degree of maturity in markets), value chains (their degree of concentration and resilience to external shocks) and conditions in the countries where projects are implemented (for example, energy demand, the stability of the regulatory framework and electricity infrastructure). While renewable energy FDI benefits from the same variables as FDI in other sectors (market incentives, stable regulatory frameworks and low political risk), it has some specific dynamics that relate to the characteristics of the sector. When decisions about investing in renewable energy are made, the expected return of the project and the associated risks are the two main variables that determine how attractive it is (Wüstenhagen and Menichetti, 2012). In particular, the nature of the technologies, which serve to diversify a firm's energy portfolio, and the increasing expansion of demand in international markets mean that market risk is typically lower for investment in renewable technologies than in other sectors. However, the high cost of the technologies and the degree of regulation in the sector mean that risks are greater at the project level (Rothballer and Kaserer, 2012). Most policy instruments designed to attract investment in the renewable energy sector aim to reduce the latter type of risk, ensure a return on investment in the medium term and lessen the risks associated with uncertainty in the market concerned (Lipp, 2007; Polzin and others, 2015 and 2019).

However, the design of the policies implemented to promote the renewable energy sector and the toolkit used to achieve the objectives set are more relevant to policy outcomes and effectiveness (Haelg, Waelchli and Schmidt, 2018; Schmidt and Sewerin, 2019). In particular, it has been shown that a crucial element when it comes to building local capacity and promoting the sector's development is to have consistent policy strategies at the macro level (goals to be achieved), the meso level (choice of instrument) and the micro level (calibration of the instrument to match the country's characteristics and objectives) (Haelg, Waelchli and Schmidt, 2018).

In this context, and in a highly globalized market whose dynamics tend to attract investments in mature technologies, it is crucial for developing countries to have policy strategies with specific goals and instruments calibrated to their needs. In these countries, which struggle to compete with international leaders, the design and calibration of instruments plays a key role in channelling the effects of policies and can influence the orientation of investments to facilitate the development of local capabilities or specific technologies (Matsuo and Schmidt, 2019).

A variety of policy approaches are available to foster the development of renewable energy markets, related production capabilities and value chains. These instruments have proven effective in different contexts. However, it is important to realize that effectiveness will depend on the policy framework in which they are embedded and how they are calibrated to suit the characteristics of the different markets. Not all these policy mechanisms have the same goal: some aim to promote the renewable energy market, others provide general support for domestic and international companies to develop technology or ancillary components locally, and others again are designed to encourage complementary activities along the chain. Supporting a just energy transition will mean combining the different instruments and calibrating them to suit the characteristics and needs of the different countries.

Table III.8 summarizes some of the instruments most commonly used to promote the renewable energy sector and attract FDI, after which the main characteristics of each instrument are described.

Table III.8

Policy approaches most commonly used around the world to attract international investment and develop the renewable energy sector

Policy approach	Effect
Long-term strategies and goals	Reduce country uncertainty and orient investment.
Feed-in tariffs	Reduce uncertainty, guarantee a return and orient investment.
Auctions	Reduce market risk, guarantee a return and orient investment.
Financial and fiscal incentives	Reduce costs, discourage investment in non-renewable energies and promote specific technologies.
Portfolio standards and quotas	Orient investment.
Direct public sector investment	Reduce uncertainty, strengthen the sector and orient research and development efforts.
Local content requirements	Develop local capabilities and cut costs.
Research and development and demonstration projects	Reduce technological risk.

Source: Economic Commission for Latin America and the Caribbean (ECLAC).

1. Long-term strategies and goals

In most countries, policies to promote the renewable energy sector have been framed within strategies to reduce long-term emissions. Since the late 1990s, with the signing of the Kyoto Protocol to the United Nations Framework Convention on Climate Change, energy transition strategies with long-term objectives have been developed in an increasing number of countries. When the Paris Agreement was signed in 2015, emission and renewable energy goals became more ambitious: since then, 194 parties have submitted their nationally determined contributions, 183 have included renewables among their goals and 143 have a quantified target (IRENA, 2022b). Long-term strategies have been the reference framework within which the most appropriate toolkits for achieving energy transition goals have been identified. National strategies (or regional ones, as in the European Union) have been implemented to accelerate the energy transition. Framing policy instruments within long-term strategies with concrete goals helps to reduce market uncertainty and encourages the mobilization of investments (Knutsson and Ibarlucea Flores, 2022; Costa and others, 2022). While many countries in the region have long-term energy transition strategies, very few have planning and policy instruments that provide a framework for identifying and selecting public investment projects (Eguino, Bonilla-Roth and Lopes 2020).

Long-term strategies and goals have the following characteristics:

- They are effective in promoting renewable energies.
- They can help reduce uncertainty.
- They must set clear and achievable goals.
- They need supplementary policies.

2. Feed-in tariffs

Feed-in tariffs, which are fixed prices designed to encourage the development of the renewable energy market, have been one of the most widely used measures in the sector and have been adopted in more than 80 countries around the world. Such tariffs incentivize investments in renewable technologies because they yield an above-market price, increase market stability and ensure the profitability of projects. The design of the tariffs depends on the characteristics of the country in which they are applied and the objectives being pursued. In most cases they are long-term and designed to ensure a significant profit margin. They may also be designed to orient investment towards the adoption or development of specific technologies. Feed-in tariffs have been found to be effective mainly in promoting the renewable energy sector (Criscuolo and Menon, 2015) and orienting investments towards specific technologies (Friebe, Von Flotow and Täube, 2014). The effectiveness of such tariffs depends, among other factors, on the length of time for which the price is guaranteed (Dijkgraaf, Van Dorp and Maasland, 2018), correct calibration of the price (Viscidi and Yépez, 2019) and complementary measures to facilitate grid connection (Jacobs and others, 2013). Systems of guaranteed fixed tariffs over long periods with ancillary measures to facilitate grid connection have been found to reduce project risk and increase investment. Since the 2000s, feed-in tariffs have been used in some countries of the region to incentivize the deployment of renewable energy. Brazil was the first country to introduce them, between 2002 and 2010, under the Alternative Sources of Energy Incentive Programme (PROINFA) (Dutra and Szklo, 2008; Kissel and Krauter, 2006; IEA, 2023b). In Argentina, feed-in tariffs were introduced in 2006 and applied to renewable energy under the National Incentive Regime for the Use of Renewable Sources of Energy for Electricity Production (IEA, 2023b). In the Dominican Republic, Costa Rica, Ecuador, Honduras, Nicaragua, Panama, Peru and Uruguay, among other countries, feed-in tariff systems have been used to promote the spread of renewables (Jacobs and others, 2013; Washburn and Pablo-Romero, 2019). While these instruments have sometimes been important for the growth of the renewable energy market, they have often been discontinued and replaced by auction mechanisms. In the Latin American and Caribbean countries, tariffs need to be carefully calibrated, especially in relation to social tariff policies, to minimize possible distortions to energy production and generation (Podestá and others, 2022).

Feed-in tariffs have the following characteristics:

- They are effective at developing the market.
- They can serve to orient investment towards specific technologies.
- The time horizon of the measure influences its effectiveness.
- Proper calibration of the price is essential to ensure the measure is effective and minimize possible distortions to energy production and generation.
- Complementary measures facilitating or guaranteeing access to the grid increase the effectiveness of tariffs.

3. Auctions

Governments may hold competitive auctions to tender out projects or project sites. At auctions, the State usually offers long-term power purchase agreements. If the objective is to promote the renewable energy market in general, auctions may be technology-neutral; if the objective is to attract projects with a particular technology, then they may specify that technology. Like feed-in tariffs, public auction mechanisms have been designed in many countries around the world, and their effectiveness has varied depending on the design and calibration of the instrument. In particular, the

length of contracts, the auction process, the price and the pricing structure (for example, the price ceiling and price floor) have a major impact on effectiveness. Long-term contracts tend to enhance market stability and attract more investment (Del Rio and Linares, 2014), particularly when applied to specific technologies. Neutral auctions tend to attract more investment in mature technologies and are not effective for emerging technologies (Mora and others, 2017). The calibration of pricing and of price caps can increase the volume of investment (Mora and others, 2017). Auctions have been one of the most widely used tools in Latin America and the Caribbean, where more than 16 countries have conducted them to implement renewable energies or incentivize projects using specific technologies (Viscidi and Yépez, 2019; Correia, Tolmasquim and Hallack, 2020). Some of the world's first successful renewable energy tenders were in Brazil in 2005 and Uruguay in 2006, when auctions were held for hydropower, wind energy and biomass projects. The first solar energy tenders in the region were held in Argentina and Peru in 2009. Since then, auctions have become the main tool for facilitating renewable energy investment in the region and have contributed to the region becoming a market of global interest.

Auctions have the following characteristics:

- When they are technology-neutral, they are effective at stimulating the market.
- When they are not neutral, they are effective at orienting investment towards emerging technologies.
- When stable prices are set and longer periods offered, they lead to an increase in the volume of investment.

4. Financial and fiscal incentives

There are various types of financial and fiscal incentives designed to promote the development of the renewable energy sector. Instruments have different goals and vary with the level of maturity of the market. In some countries, for example, subsidy, incentive or tax reduction schemes have been designed to reduce the total cost of investments, to promote the development of manufacturing activities or to discourage non-renewable energy projects. While one or more financial and fiscal incentive schemes have been designed in most countries, these mechanisms have been found to be effective if implemented as supplements to other instruments (particularly differentiated tariffs and auctions) (Li, Chang and Chang 2017). However, financial and fiscal incentives can be useful for attracting venture capital and disincentivizing fossil fuel investments (Pfeiffer and Mulder, 2013). Financial and fiscal incentive schemes have been designed in almost all Latin American and Caribbean countries to promote the deployment of renewable energies (IEA, 2023b). Among the most commonly used measures are exemptions from or reductions in tariffs or value added taxes on imports of technology, machinery and materials for renewable energy projects. In addition, there are special regimes in many countries that reduce income tax on activities linked to renewable energy generation, and there are also mechanisms for accelerated depreciation of investments in machinery and equipment used to generate renewable energy. Some countries of the region, such as Argentina, Chile, Colombia and Mexico, have carbon taxes or green taxes designed to incentivize renewable energy sources. In addition, Mexico and Colombia were two of the first countries in the region to implement emissions trading systems.

Financial and fiscal incentives have the following characteristics:

- They are applied to reduce project financing costs.
- They are effective if they supplement other mechanisms.
- They can be helpful in attracting venture capital.
- They can be helpful in disincentivizing fossil fuel investments.

5. Portfolio standards and quotas

To steer the market towards renewable technologies, governments can require companies in the energy and electricity sector to have a minimum percentage of renewable energy in their portfolios. The design of portfolio standards and quotas varies according to the objective of decision-makers and can include mandatory generating quotas, mandatory technologies or sales requirements. The simplest design is a requirement for a set percentage of electricity in each supplier's portfolio to be generated from renewables. In some cases, mechanisms for incremental portfolio standards have been designed, setting obligations that change over the years. They have generally been an effective tool in developed energy markets (Baldwin and others, 2017). The first countries to implement portfolio standards were the United States, the United Kingdom and Japan. In the case of the United Kingdom, the data suggest that, as with the other instruments, a prespecified duration has a positive impact on investment (Lauber, 2004). In the United States, the effectiveness of portfolio standards has been variable and has depended on the energy policies of the different states (Shrimali and Kniefel, 2011). In addition, the allocation of quotas by technology can orient investments and, if well calibrated, incentivize the development of emerging technologies and increase environmental sustainability (Mamkhezri, Malczynski and Chermak, 2021). In recent years, as renewables markets and technologies have matured, there has been a progressive increase in the use of portfolio standards and mandatory renewable energy quotas (Bangjun and others, 2022). In Latin America and the Caribbean, this tool has been used in some specific cases to incentivize renewable energy generation. In Argentina, for example, Law 27191 introduced progressive quotas for renewable energy consumption. In Colombia, all energy distributors serving the regulated user market have been required since 2022 to obtain 10% of their energy from non-conventional sources. In 2023, the measure was extended to all companies trading in the wholesale energy market (IEA, 2023b).

Portfolio standards and quotas have the following characteristics:

- Their purpose is to increase the percentage of renewable energy.
- They can be applied to generation and sales.
- They can be nominal or incremental.
- They require a medium- to long-term time horizon.
- If properly calibrated they can foster the development of emerging technologies.
- They are most effective in developed energy markets.

6. Direct public sector investment

To boost the development of the energy sector, governments can implement public investment strategies for renewable energy. On average, direct public sector investments in renewables have accounted for about 6% of all investment (IRENA/CPI, 2023). China has led the international statistics for this type of investment, but developed countries have recently announced substantial public investment packages. Both the European Union and the United States have activated investment packages aimed at fostering technological development in the energy sector. The typology of public sector investments depends on the structure of the State and the financial markets. Among the conventional channels for public investment have been national development banks and State-owned enterprises (Geddes, Schmidt and Steffen, 2018; Waidelich and Steffen, 2023; Steffen and Schmidt, 2019). Direct public sector investment depends on countries' capacity and has been crucial in catalysing private investment, facilitating market growth and promoting technological development (IRENA/CPI, 2023).

Direct public sector investment has the following characteristics:

- It is intended to promote the development of the sector or of specific technologies.
- It is important in weak or underdeveloped markets.
- It has been channelled mainly through development banks and State-owned enterprises.
- It is carried out mainly in China and developed countries.

7. Local content requirements

Minimum local content requirements are intended to promote the development of a country's production system at the various stages of the renewable energy chain. The most general version of this mechanism requires a minimum percentage of local content to be included in all or some renewable energy projects. The design varies according to decision-makers' objectives and depends mainly on the stage of the chain at which capacity-building is sought, the capabilities already in place in the country, the maturity of the market, the structure of domestic and international value chains and the complexity of the product. In general, results are achieved in the medium and long term, and effectiveness depends on how this mechanism combines with other instruments (Baker and Sovacool, 2017). In many countries, it has been used to promote the development of wind and photovoltaic technologies and related components. Some emblematic cases have been Spain, Canada, China, Mexico, Brazil, India and South Africa (Huenteler, Niebuhr and Schmidt, 2016). The evidence is that, if well calibrated to local capacity and the global structure of the sector, local content requirements can foster local capabilities and reduce the cost of developing projects, thereby increasing countries' ability to attract investment (Lewis and Wiser, 2007; Binz and others, 2017; Liu and Kokko, 2010). The effectiveness of policy design has varied depending on the type of technology and level of product sophistication. Generally, setting achievable requirements that match the capabilities of the sector has been crucial for initiatives to work (Baker and Sovacool, 2017; Rennkamp and Boyd, 2015). In the case of wind turbines, for example, the most successful cases have been those where stable levels of demand have been guaranteed (Bergek and Jacobsson, 2003); in the case of solar module cells, by contrast, global market growth has been more important than domestic demand (Grau, Huo and Neuhoff, 2012). In all cases, the determining factor has been the calibration of instruments to local capacity. When it comes to investment, local content requirements may have different impacts depending on the technology, the global market and domestic capabilities (Hansen and others, 2020). It should be mentioned that, under World Trade Organization (WTO) rules, local content requirements could be considered a violation of article III.4 of the General Agreement on Tariffs and Trade (GATT), article 2 of the Agreement on Trade-Related Investment Measures and article 3 of the Agreement on Subsidies and Countervailing Measures. The position taken by WTO on local content requirements was in evidence in its response to measures in the solar energy sectors of Canada and India. In both cases, WTO bodies found local content requirements to be in violation of the agreements (WTO, 2014 and 2018). In the last decade, however, such measures have been applied in developed and developing countries' renewable energy promotion programmes.

Local content requirements have the following characteristics:

- They foster local capabilities at specific stages of the chain and of the different technologies.
- Their effectiveness depends on the instrument being calibrated to the country's capabilities.
- Results are medium- and long-term.
- Domestic demand and international market dynamics are critical to the effectiveness of the measure.

8. Research and development and demonstration projects

Research and development (R&D) support programmes and demonstration projects have been crucial in fostering renewable energy manufacturing and technological capabilities (Plank and Doblinger, 2018). The effectiveness of these instruments depends on the structure and functioning of the national innovation system. Public R&D programmes and demonstration projects have been most successful in countries where there is a high degree of coordination between the private sector, the public sector and universities (Kamp, 2002). Demonstration projects can be crucial in reducing investor risk when technology is developed locally, because they provide information and data on the effectiveness of the technology. Similarly, public R&D spending can have a positive impact on decisions about investment in renewable technologies, since it reduces the uncertainty and technical risk associated with these (Azhgaliyeva, Beirne and Mishra, 2023).

R&D and demonstration projects have the following characteristics:

- Their purpose is to develop renewable technologies and reduce the risk associated with them.
- Their effectiveness depends on the characteristics of the national innovation system.
- If they are part of a set of policy instruments, they have a positive impact in mobilizing investment.

9. Guidelines for policy design

Although there is no single recipe and it is not possible to establish a priori the ideal set of instruments for fostering the development of the renewable energy sector in different countries, it is possible to identify some guidelines that may be useful when designing policies in the countries of the region:

- Ensuring that instruments are predictable and stable is crucial for reducing political risk. It is therefore necessary to implement long-term strategies with clear objectives and a level of flexibility that allows decision-makers to recalibrate the set of instruments or specific instruments to the dynamics of the sector and the country's needs.
- Each instrument should be calibrated according to the country's specific objectives and needs.
- Market stability is a necessary condition for the development of the sector. Instruments such as feed-in tariffs, auctions, domestic investment and fiscal incentives have proven effective in fostering this stability.
- Technologically neutral instruments allow the most competitive technologies to be attracted. However, if they are not well calibrated with other instruments, technological lock-in or dependence could ensue.
- To attract emerging technologies, it is necessary to tailor the different instruments to the specific characteristics of each.
- In the case of mature technologies, it could be useful to design technology-specific instruments to promote local incremental innovation and learning by doing.
- Instruments intended to foster local manufacturing capabilities need to be calibrated to the capacity of the local context at the different stages of the chains that are to be established in the country, to avoid objectives becoming mismatched and costs rising.
- In countries where production capabilities are limited and the sector is at an intermediate level of development, instruments can be put in place to develop operations in the country incrementally, from the production of secondary components to that of components for the development of technologies, taking into account the possible future dynamics of international manufacturing costs.

- Designing instruments to encourage local service provision right along the value chain can nurture capabilities in engineering, construction, project development, operation and maintenance services. These services can lower the cost of projects domestically and can be exported to other countries.

For instruments to be most effective, they need to form part of production development policies and agendas that address other bottlenecks which may be limiting inward investment and, more generally, the development of the renewable energy sector. These agendas could include complementary activities such as training human talent with the profiles and skills needed in the sector, making the necessary policy and regulatory adjustments, building specific complementary infrastructure, incubating and accelerating start-ups in the sector, and other activities. A useful tool for working on these more comprehensive agendas can be cluster initiatives, which create the conditions for coordination between public, private, academic and other civil society actors to create strategic agendas for these sectors, as happened with the Bogotá Electrical Energy Cluster initiative (Llinás Vargas, 2021).

Although Latin America and the Caribbean has been a strategic destination for renewable energy investments, if it is to secure the resources it needs to carry forward the energy transition, it will have to implement medium- and long-term strategies that mobilize domestic and international investment in renewable energy development. While wind and solar energy have attracted the most investment and have the potential to drive the energy transition in the region, it is essential to have policies and toolkits that orient investment towards emerging technologies and facilitate diversification of the energy mix.

F. Conclusions

There is great potential in Latin America and the Caribbean to increase the development of renewable energies and related production activities and services. In recent years, the countries of the region have accelerated their energy transition efforts and designed ambitious strategies aimed at moving towards more sustainable development models. The region's installed renewable energy capacity is greater than the world average, and the electricity generation mix is one of the world's cleanest (ECLAC, 2023).

Most of the countries have set medium- and long-term goals for renewable energy penetration and implemented policy mechanisms designed to increase investment in the sector. The most commonly used instruments have included auctions, feed-in tariffs, fiscal incentives, minimum portfolio standards and energy certification. By developing the renewable energy market and regulation, the region has positioned itself in the world and become the third-largest regional recipient of renewable energy FDI. The main destination countries have been Chile, Brazil and Mexico, with solar and wind technology leading investment. FDI in the region has been driven mainly by the growing size of the market and the high return on investment, which has been confined almost exclusively to power generation via project development and to territories where generating potential is highest.

International experience shows that the energy sector can create production linkages in sectors related to the transition. For one thing, activities associated with the renewable energy value chain, from critical minerals and technology development to the provision of engineering, construction and maintenance services, represent an opportunity to strengthen production capabilities and develop new service sectors. For another, clean energy can increase the region's energy efficiency and encourage more energy-intensive production activities, as in the case of green hydrogen. A growing supply of renewable energy will not only be essential to meet the region's rising demand, but could also become a strategic asset to attract investment in other sectors, not just renewable energy.

Here it should be borne in mind that the developed countries have embarked on ambitious strategies aimed at fostering the green transition, and that large investments are being channelled into the energy transition and capacity-building in energy-related industries. Driving the energy transition and the development of related industries in the region will require subnational, national and regional strategies that go beyond energy policy and encompass production development policies designed to strengthen capacities right along the chain.

ECLAC (2023) has identified the energy transition as one of the strategic areas of action to spur the region's recovery and has proposed eight transformative policies that can accelerate it:

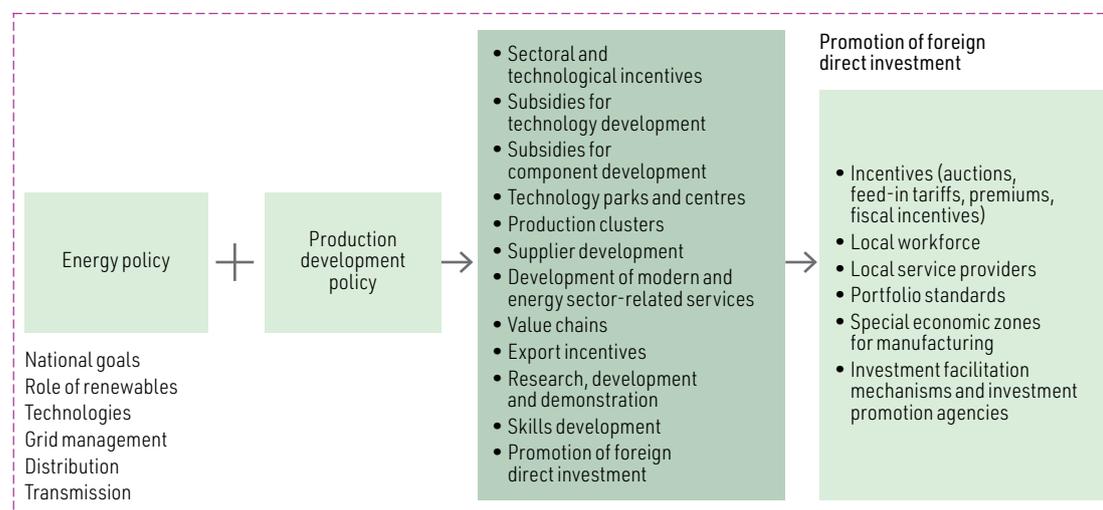
- (i) Foment public and private investment to increase the share of renewable energies and expand the infrastructure for energy services and universal access to these.
- (ii) Universalize electrification and facilitate the deployment of distributed generation technologies, particularly in rural, remote or isolated communities not served by interconnected systems.
- (iii) Use a variety of instruments such as regulations, incentives, subsidies and public procurement to boost renewable energy demand.
- (iv) Develop renewable energy value chains by harnessing the region's critical raw materials to produce technologies, components, storage systems and other energy sources such as green hydrogen.
- (v) Pursue production development policies with a view to introducing renewable technologies via investments in R&D and support for the manufacture of technologies, parts and components and for engineering, maintenance and operation services. Cluster initiatives could be a valuable tool to nurture production capabilities at specific stages of the chain.
- (vi) Increase financing and design forms of blended finance that make investments less risky and channel them towards renewable technologies.
- (vii) Encourage participatory governance and cooperation between the public and private sectors, and increase decentralization and informed participation. Cluster initiatives could also be a useful tool here.
- (viii) Plan for the long term, foster regional energy integration and leverage the scale of the regional market to strengthen value chains.

FDI can play a vital role in accelerating the energy transition, facilitating technology transfer and enabling emerging technologies. However, investment policies need to be designed in the broader context of energy transition policies, taking into account the drivers of investment, market forces and international technology development to calibrate the toolbox and steer investments towards priority technologies, sectors or stages of the chain. These agendas need to be supported by institutional mechanisms that facilitate coordination between different parts of the public sector, between the public and private sectors, and between the different levels. Cluster initiatives are one of the mechanisms that could be used to promote this coordination.

In this context, it is essential to calibrate policy tools to the goals of national strategies, the characteristics of the energy market and existing capabilities in each country. The challenge for the countries of Latin America and the Caribbean is to implement investment strategies that enable them to attract frontier technologies, build capabilities and take advantage of production development opportunities. Strengthening local capabilities in developing countries is critical to meeting climate commitments. While there is no one right instrument or combination of instruments for promoting renewable energy investments, promising methods include the use of incentives and subsidies for the development of emerging technologies, local workforce or content requirements, the establishment of special economic zones for the development of sophisticated technologies, and investment facilitation and promotion mechanisms (see diagram III.4).

Diagram III.4

Strategies to promote the energy transition and related capacity-building



Source: Economic Commission for Latin America and the Caribbean (ECLAC).

Lastly, it should be noted that a successful energy transition could become a comparative advantage in efforts to attract investment in other sectors, such as energy-intensive industries, and to attract activities that complement renewable energies, such as those related to green hydrogen and the development of carbon-neutral technologies. In a very dynamic international market, the countries of the region have a great opportunity to make progress with this important challenge.

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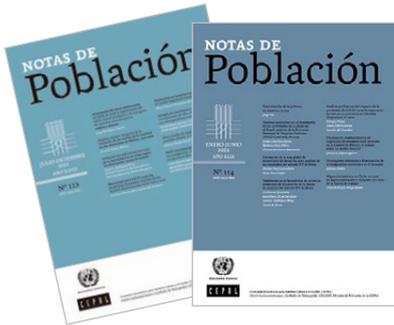
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Glyphs from the Mayan numbering system found in pre-Hispanic codices. Bas-relief on the spiral tower of the ECLAC headquarters building in Santiago.

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Against the backdrop of the reconfiguration of globalization and mixed trends in global foreign direct investment (FDI) inflows, with declines for the world's major recipients, FDI inflows in Latin America and the Caribbean grew for the second year in a row in 2022, by 55.2% to US\$ 224.579 billion, the highest level on record.

The first chapter of this report provides an overview of global and regional FDI trends and makes recommendations to ensure that these investments advance productive development processes in the countries of the region. The second chapter analyses investments in the energy sector, which have profoundly shaped recent global and regional FDI trends, along with the role of this type of investment in non-renewable energies and the challenges posed for the energy transition. The third chapter examines FDI in renewable energies and suggests strategies to drive the energy transition in the region.



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