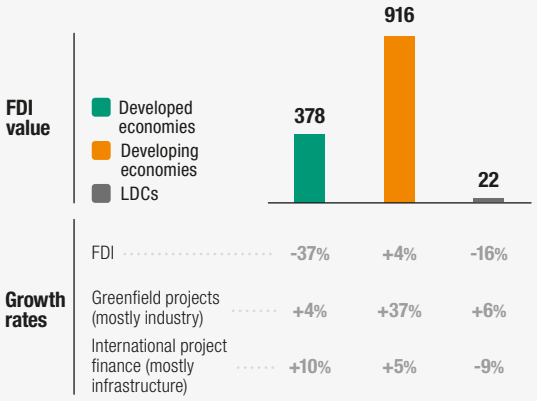
CHAPTER I

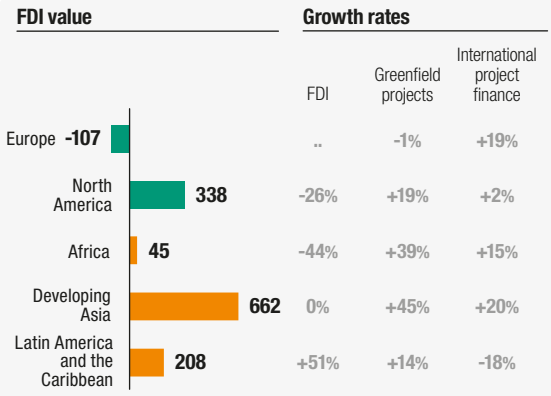
INTERNATIONAL INVESTMENT TRENDS

INTERNATIONAL INVESTMENT TRENDS in 2022

Income groups



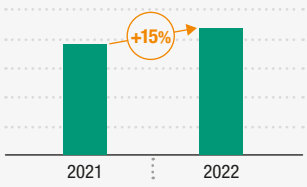
Regions



Developing economies account for **70% of global FDI**

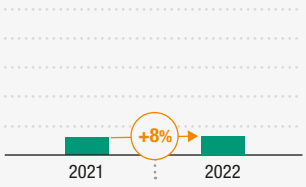
Greenfield projects

(Number)



International project finance

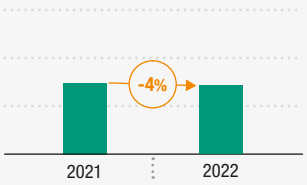
(Number)



Project activity in **developing regions** continues to **grow**

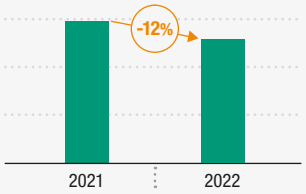
Cross-border M&As

(Value)



FDI

(Value)



Infrastructure, GVCs and chips see rising investment

SDG investment is moving, but **too slowly in some sectors**

Industries

(Project numbers)

Infrastructure	+6%
GVC-intensive industries	+5%
Semiconductors	+26%
Digital economy	-10%
Energy	-1%

SDG sectors

(Developing countries, project numbers)

Infrastructure	+26%
Renewable energy	+8%
WASH	+20%
Agrifood systems	+6%
Health and education	+8%

A. FOREIGN DIRECT INVESTMENT

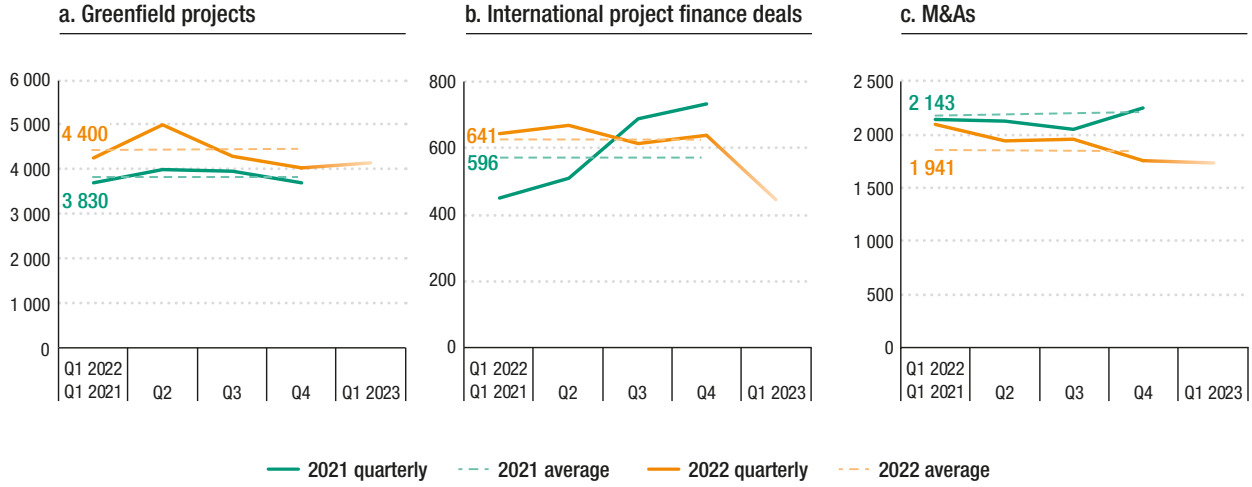
1. Global trends

Global foreign direct investment (FDI) flows in 2022 declined by 12 per cent to $1.3 trillion, after nosediving in 2020 and rebounding in 2021.[1] The multitude of crises and challenges on the global stage – the war in Ukraine, high food and energy prices, risks of recession and debt pressures in many countries – negatively affected global FDI. International project finance values and cross-border mergers and acquisitions (M&As) were especially shaken by stiffer financing conditions, rising interest rates and uncertainty in financial markets. The value of international project finance deals fell by 25 per cent in 2022, while cross-border M&A sales were 4 per cent lower.

The global environment for international business and cross-border investment remains challenging in 2023. Although the economic headwinds shaping investment trends in 2022 have somewhat subsided, they have not disappeared. Commodity prices that rose sharply with the war in Ukraine have tempered, but the war continues, and geopolitical tensions are still high. Recent financial sector turmoil in some developed countries adds to investor uncertainty. In developing countries, continuing high debt levels limit fiscal space. UNCTAD expects the downward trend of global FDI to continue in 2023.

Early indicators confirm the negative FDI outlook: FDI project activity in the first quarter of 2023 shows that investors are uncertain and risk averse. According to preliminary data, the number of international project finance deals in the first quarter of 2023 was down significantly; cross-border M&A activity also slowed (figure I.1).

Figure I.1. **Announced greenfield projects, international project finance deals and cross-border M&As, Q1 2021–Q1 2023** (Number and per cent)



Source: UNCTAD, based on information from the Financial Times Ltd, fDi Markets (fDimarkets.com) and Refinitiv SA.

Table I.1. Growth rates of global GDP, GFCF, trade and FDI, 2020–2023
(Per cent)

Variable	2020	2021	2022	2023[a]
GDP	-2.8	6.3	3.4	2.8
Trade	-7.8	10.6	5.1	2.4
GFCF	-2.5	8.0	-2.4	2.4
FDI	-43.7	53.7	-12.4	
Memorandum: FDI value (trillions of dollars)	1.0	1.5	1.3	

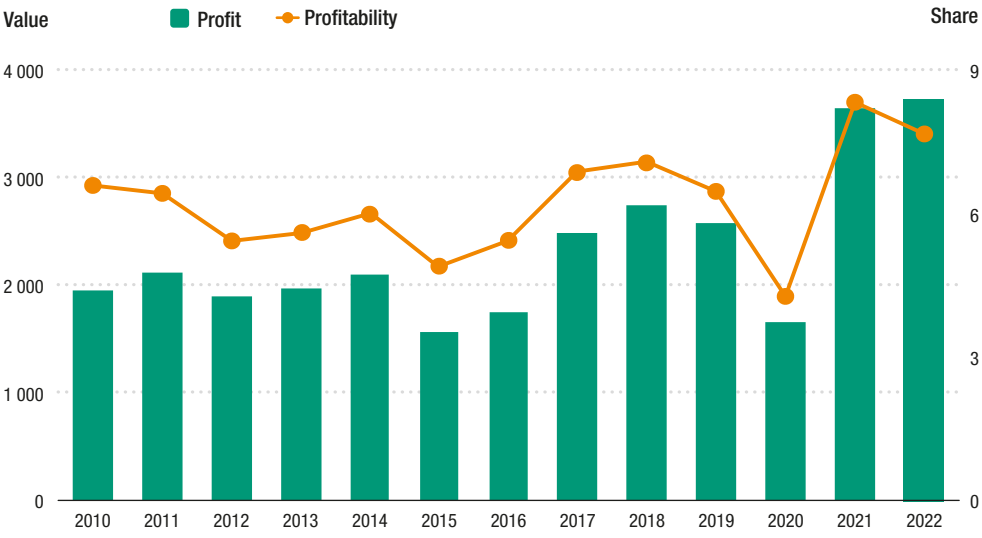
Source: UNCTAD, FDI/MNE database for FDI; IMF (2023) for GDP, GFCF and trade.
Note: GFCF = gross fixed capital formation.
[a] Forecast.

Global FDI trends are in line with other macroeconomic variables, which show either negative or slow growth rates (table I.1). Among the components of FDI, retained earnings remained high in 2022. This reflects the continued high profit levels of the largest multinational enterprises (MNEs) across all sectors (figure I.2), especially the extractive industries.

FDI flows to developed economies fell by 37 per cent, to $378 billion. Much of the decline was driven by one-off transactions and financial flows, and there were signs of investment strength in new projects. Announced greenfield projects were up 4 per cent in number and 37 per cent in value (table I.2).

FDI flows to developing economies rose by 4 per cent, to $916 billion – the highest level ever recorded. Announcements of greenfield projects in developing countries rose by 37 per cent in number, and their value more than doubled. This increase was mostly the result of megaprojects announced in the renewable energy sector, including five of the 10 highest-value projects.

Figure I.2. Profits and profitability levels of the largest MNEs, 2010–2022
(Billions of dollars and per cent)



Source: UNCTAD, based on information from Refinitiv SA.
Note: Covers 3,849 MNEs for which data was available for every year in the range. Profitability is calculated as the ratio of net income to total sales.

Table I.2. Announced greenfield projects, international project finance deals and cross-border M&As, by economic grouping, 2021–2022 (Billions of dollars, number and per cent)

Group of economies	Type of FDI	Value (Billions of dollars) 2021	Value (Billions of dollars) 2022	Growth rate (%)	Number 2021	Number 2022	Growth rate (%)
Developed economies	Greenfield projects	465	639	37	10 342	10 790	4
	International project finance	774	665	-14	1 413	1 549	10
	Cross-border M&As	624	599	-4	7 610	6 710	-12
Developing economies	Greenfield projects	274	573	110	4 976	6 808	37
	International project finance	609	379	-38	970	1 015	5
	Cross-border M&As	113	107	-5	961	1 053	10

Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fDimarkets.com) and Refinitiv SA.

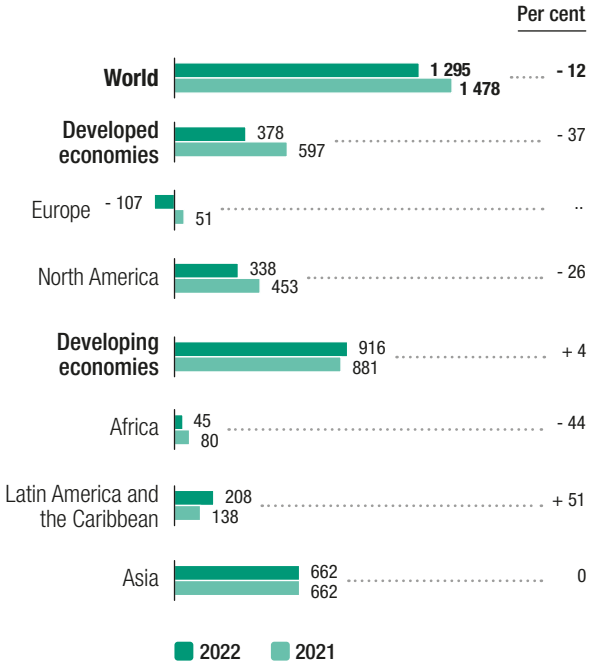
2. Trends by geography

a. FDI inflows

The 2022 decline in developed economies reflected the uncertainty in financial markets and the winding-up of stimulus packages, but the volatile nature of FDI flows in developed markets also continued to affect aggregate values. In Europe, FDI totals were affected by fluctuations in the major conduit economies as well as by a large withdrawal of capital by a telecommunication MNE operating in Luxembourg. In the United States, where inflows fell by 26 per cent, the halving of cross-border M&A values played a role.

FDI flows to developing economies as a group increased (figure I.3). Inflows to developing Asia remained flat at $662 billion (table I.3). Those to Latin America and the Caribbean rose by 51 per cent to $208 billion – a record level. And inflows to Africa fell by 44 per cent following the anomalous peak in 2021 caused by a large corporate reconfiguration in South Africa.

Figure I.3. FDI inflows by region, 2021–2022 (Billions of dollars and per cent)



Source: UNCTAD, FDI/MNE database (https://unctad.org/fdistatistics).

Developing countries accounted for more than two thirds of global FDI, up from 60 per cent in 2021. The impacts of the multidimensional crises, especially in food and energy, and financial and debt distress hit investment flows to the poorest countries disproportionally. Flows to the least developed countries (LDCs) fell by 16 per cent; they continue to account for only 2 per cent of global FDI.

Table I.3. FDI flows, by region, 2020–2022 (Billions of dollars and per cent)

Region	FDI inflows			FDI outflows		
	2020	2021	2022	2020	2021	2022
World	**962**	**1 478**	**1 295**	**732**	**1 729**	**1 490**
Developed economies	315	597	378	350	1 244	1 031
Europe	133	51	-107	-38	573	224
European Union	116	152	-125	64	477	96
Other Europe	17	-102	18	-102	97	128
North America	123	453	338	247	447	452
Other developed countries	60	93	147	141	224	354
Developing economies	647	881	916	382	485	459
Africa	39	80	45	1	3	6
Asia	516	662	662	383	445	396
Central Asia	7	7	10	- 2	1	- 2
East Asia	285	334	324	267	290	269
South Asia	71	53	57	11	18	16
South-East Asia	119	213	223	69	81	86
West Asia	35	56	48	38	55	27
Latin America and the Caribbean	90	138	208	-1.0	38	59
Oceania	1.0	1.3	1.2	-0.9	-1.6	-2.1
Structurally weak, vulnerable and small economies[a]	**38**	**43**	**41**	**0.2**	**2.2**	**1.0**
LDCs	23	26	22	1.4	-0.6	1.4
LLDCs	15	19	20	-1.4	1.6	-2.2
SIDS	6	6	8	1.0	0.8	1.6
Memorandum: percentage share in world FDI flows						
Developed economies	32.8	40.4	29.2	47.8	72.0	69.2
Europe	13.8	3.4	- 8.2	- 5.3	33.2	15.1
European Union	12.0	10.3	- 9.7	8.7	27.6	6.5
Other Europe	1.8	- 6.9	1.4	- 13.9	5.6	8.6
North America	12.8	30.7	26.1	33.7	25.8	30.4
Other developed countries	6.3	6.3	11.4	19.3	13.0	23.8
Developing economies	67.2	59.6	70.8	52.2	28.0	30.8
Africa	4.1	5.4	3.5	0.2	0.2	0.4
Asia	53.7	44.8	51.1	52.3	25.8	26.6
Central Asia	0.7	0.5	0.8	- 0.3	0.1	- 0.2
East Asia	29.6	22.6	25.0	36.5	16.8	18.1
South Asia	7.4	3.6	4.4	1.5	1.0	1.1
South-East Asia	12.3	14.4	17.2	9.4	4.7	5.8
West Asia	3.7	3.8	3.7	5.2	3.2	1.8
Latin America and the Caribbean	9.3	9.3	16.1	- 0.1	2.2	4.0
Oceania	0.1	0.1	0.1	- 0.1	- 0.1	- 0.1
Structurally weak, vulnerable and small economies[a]	4.0	2.9	3.2	0.03	0.1	0.1
LDCs	2.4	1.8	1.7	0.2	-0.0	0.09
LLDCs	1.6	1.3	1.5	-0.2	0.1	-0.15
SIDS	0.6	0.4	0.6	0.13	0.05	0.1

Source: UNCTAD, FDI/MNE database (www.unctad.org/fdistatistics).
[a] Without double counting countries that are part of multiple groups.

The number of investment projects (including greenfield projects and international project finance deals) increased by 14 per cent in 2022. Although more projects were announced in developed countries, the share of developing economies reached close to 40 per cent, up from an average of 33 per cent in the last two years (table I.4).

Table I.4. Announced greenfield projects and international project finance deals, by region, 2020–2022 (Number and per cent)

Region	Greenfield projects				International project finance deals			
	2020	2021	2022	Growth rate, 2021–2022 (%)	2020	2021	2022	Growth rate, 2021–2022 (%)
World	**13 394**	**15 318**	**17 598**	**15**	**1 353**	**2 383**	**2 564**	**8**
Developed economies	9 101	10 342	10 790	4	797	1 413	1 549	10
Europe	6 377	7 475	7 382	-1	471	870	1 038	19
European Union	4 847	5 854	5 710	-2	365	617	781	27
Other Europe	1 530	1 621	1 672	3	106	253	257	2
North America	1 982	2 070	2 469	19	188	325	331	2
Other developed countries	742	797	939	18	138	218	180	-17
Developing economies	4 293	4 976	6 808	37	556	970	1 015	5
Africa	572	551	766	39	96	136	157	15
Asia	2 663	3 192	4 625	45	245	475	568	20
Central Asia	42	54	42	-22	17	24	20	-17
East Asia	582	672	557	-17	32	84	88	5
South-East Asia	759	848	1 083	28	117	152	226	49
South Asia	460	507	1 089	115	50	155	205	32
West Asia	820	1 111	1 854	67	29	60	29	-52
Latin America and the Caribbean	1 058	1 231	1 409	14	212	351	287	-18
Oceania	-	2	8	300	3	8	3	-63

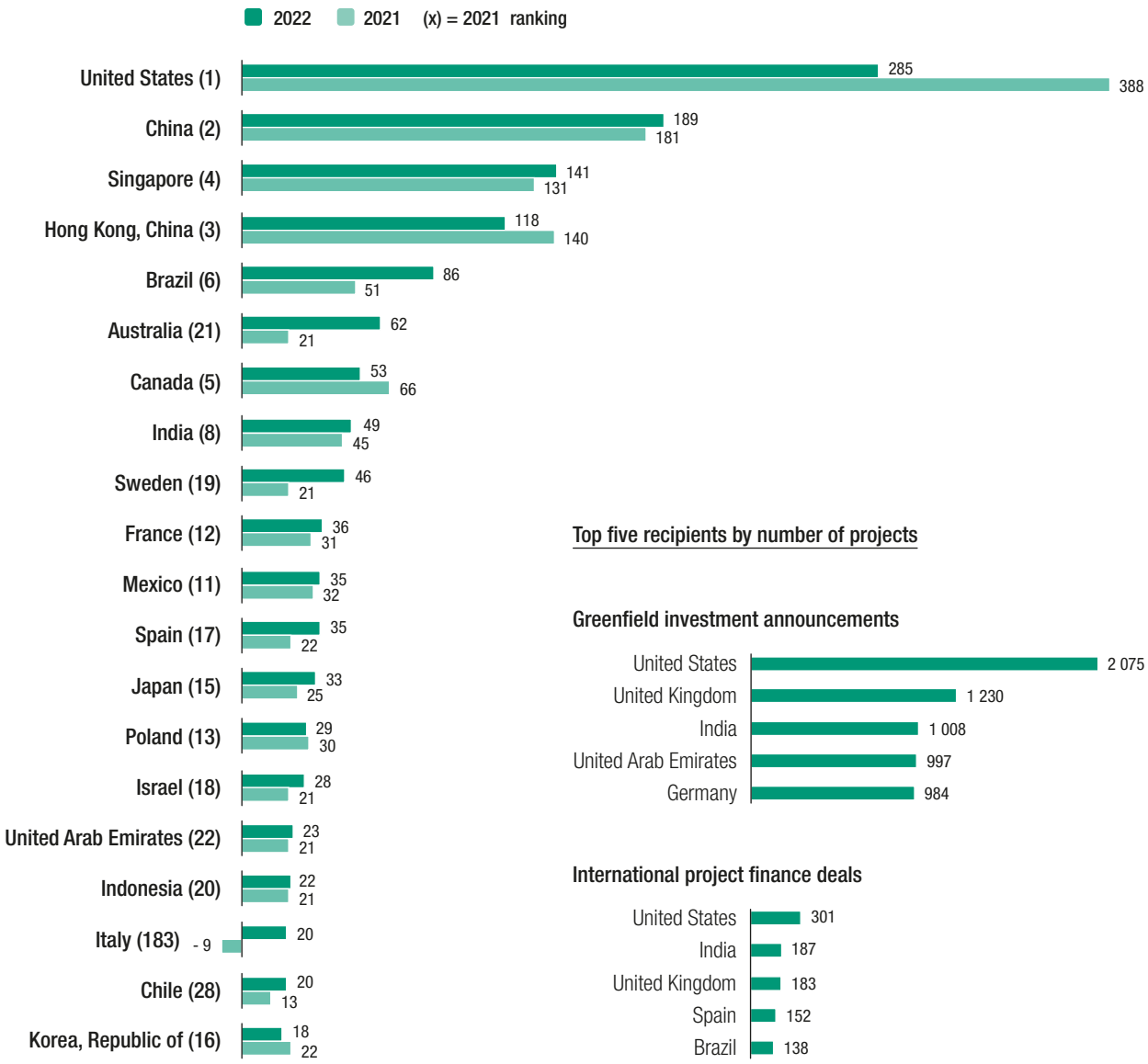
Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fDimarkets.com) and Refinitiv SA.

Most regions, other than East and Central Asia, recorded an increase in announced greenfield projects. The highest growth was in South Asia; the number in India more than doubled. The number of announced projects also increased by two thirds in West Asia, mainly because of the significant rise of activity in the United Arab Emirates, which made that country the fourth largest recipient of greenfield projects in the world (figure I.4). Africa also saw a jump in 2022 (39 per cent), mainly caused by a doubling of the number of projects in Egypt and increases in the number of projects in South Africa, Morocco and Kenya. In East Asia, announced greenfield projects fell by 17 per cent.

The number of international project finance deals also rose in most regions, although more modestly. The most significant rise was in India, where project numbers increased by 64 per cent, making it the recipient of the second largest number of international project finance deals. In the European Union (EU), project numbers increased by 27 per cent, with significant increases in Italy (78 per cent), Germany (57 per cent) and Spain (10 per cent).

The United States remained the largest host for announced greenfield projects and international project finance deals, followed by the United Kingdom, India, the United Arab Emirates and Germany for greenfield projects, and by India, the United Kingdom, Spain and Brazil for project finance deals.

Figure I.4. FDI inflows, top 20 host economies, 2021 and 2022 (Billions of dollars)



Source: UNCTAD, FDI/MNE database (https://unctad.org/fdistatistics).

(i) Developed economies

In 2022, FDI flows to developed countries as a group fell by 37 per cent, largely in Europe and North America. In the other developed countries, they rose (figure I.5).

In the United States, flows declined by 26 per cent to $285 billion, mainly due to the halving of cross-border M&As, which generally account for a large share of inflows. Among the 10 largest sales, only one occurred in the United States. The decrease in M&As had a direct impact on the equity component of FDI, which fell by 35 per cent. Inflows declined strongly in chemicals, computer and electronic products and finance. Information and communication remained the largest recipient industry ($51 billion) – a 21 per cent increase from 2021.

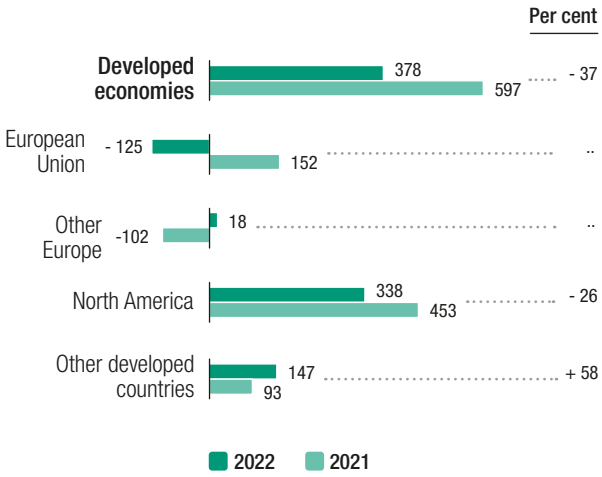
FDI in Canada decreased by 20 per cent to $53 billion, as cross-border M&A sales fell by 37 per cent. As in 2021, large sales occurred in extractive industries. For example, Rio Tinto (United Kingdom) acquired Turquoise Hill Resources, an operator of copper and nickel

ore mines, for $3.3 billion, and Newcrest Mining (Australia) acquired Pretium Resources, an operator of a gold ore mine, for $2.8 billion.

Total values for FDI inflows in developed countries, Europe and the EU are distorted by large fluctuations in conduit economies and by one-off M&A transactions. Excluding Luxembourg, inflows to the EU increased from $127 billion to $197 billion.

Sweden saw FDI inflows more than double to $46 billion – making it the largest EU recipient of FDI. Equity investment accounted for two thirds of total inflows, mostly the result of a steep rise in cross-border M&As, to $35 billion. Flows in France were up 18 per cent to $36 billion, also mainly due to large M&A deals (from $4.6 billion to $31 billion), in transportation and storage, information and communication, and finance and insurance. Greenfield projects announced in France reached $20 billion, up from $14 billion in 2021.

Figure I.5. FDI inflows in developed economies, by subregion, 2021–2022
(Billions of dollars and per cent)



Source: UNCTAD, FDI/MNE database (https://unctad.org/fdistatistics).

FDI also grew in Italy, from -$9 billion to $20 billion. While cross-border M&As declined to $11 billion, announced greenfield projects rose 28 per cent, to $25 billion. The number of international project finance deals doubled to 114, making Italy the sixth largest recipient of such deals. In Germany, FDI flows fell by 76 per cent, to $11 billion, owing to a decline in equity investment caused mostly by the acquisition of a Finnish-owned affiliate by the German State, for $20 billion.

In Switzerland and the United Kingdom, flows turned positive after large negative values in 2021. In Switzerland, there was a large deal in pharmaceuticals with CSL Behring (Australia) acquiring Vifor Pharma for $11 billion. FDI flows to the United Kingdom rose to $14 billion after a revised -$71 billion in 2021. Cross-border M&A sales doubled to $202 billion.

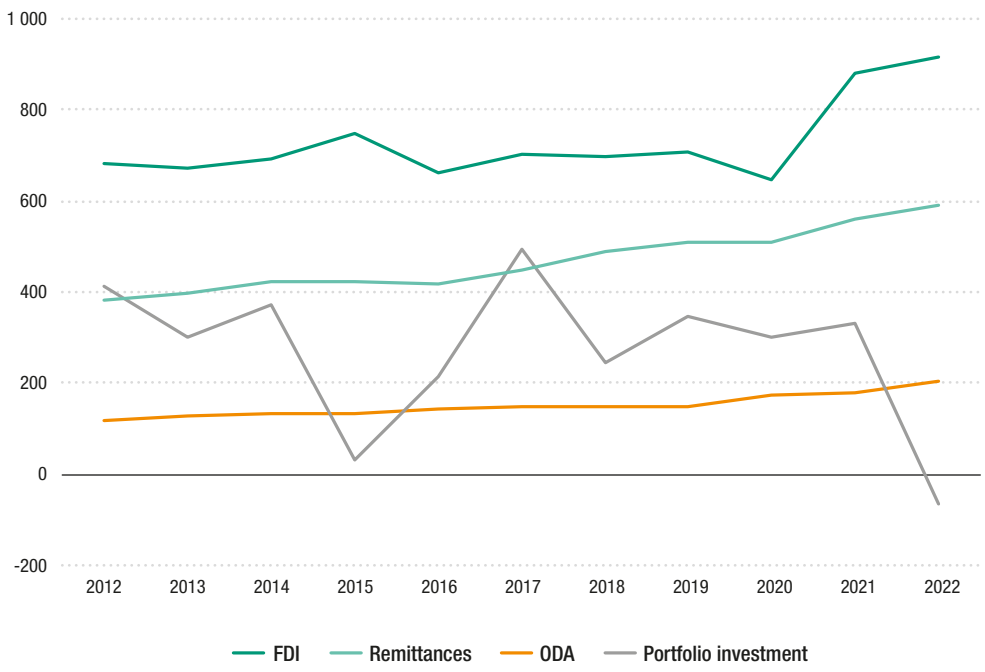
In the Russian Federation, FDI flows fell to -$19 billion in 2022 from $39 billion in 2021, as more large companies divested. Flows to Ukraine fell to $1 billion from $7 billion last year.

Most other developed economies saw FDI inflows rise in 2022. In Australia, flows tripled to $62 billion as M&A sales almost tripled. In Israel, FDI continued its upward trend, to $28 billion. FDI flows to Japan also increased again, reaching $33 billion – the highest level ever recorded. Flows to the Republic of Korea fell by 18 per cent, to $18 billion.

The value of announced greenfield projects in developed economies rose by 37 per cent to a record $639 billion, while the number of projects rose by 4 per cent. The value of projects in the primary sector remained low (at $12 billion); in manufacturing and services it rose by 39 and 35 per cent, respectively. Greenfield projects in electronics and electrical equipment grew to a record $118 billion. Automotives also saw a rise, to $37 billion. The value of announced projects in electricity and gas supply more than doubled, to $196 billion. The largest deal was in semiconductors, a plan by Taiwan Semiconductor Manufacturing (Taiwan Province of China) to boost capital spending in the United States to $28 billion.

The number of international project finance deals in developed economies rose by 10 per cent in 2022, reaching 1,549 projects – a record. However, the total value of deals fell by 14 per cent to $665 billion. Renewable energy remained the most important industry, with more than half the deals (855), the same level as in 2021.

Figure I.6. **Developing economies: sources of external finance, 2012–2022** (Billions of dollars)

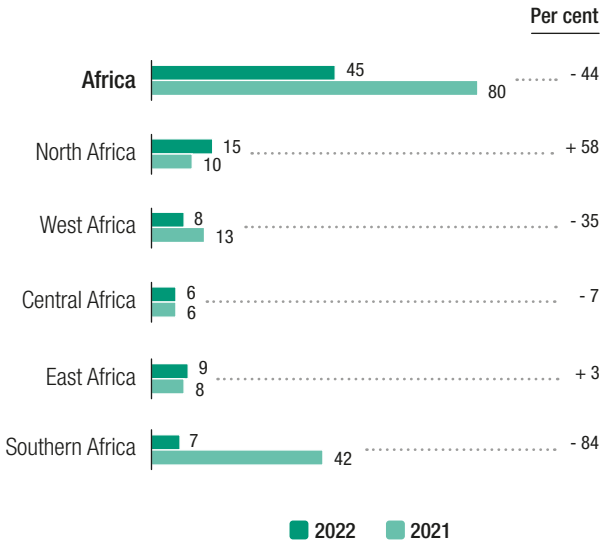


Source: UNCTAD, based on FDI/MNE database (https://unctad.org/fdistatistics) (for FDI), World Bank (for remittances), IMF International Financial Statistics (for portfolio investment) and OECD (for ODA).

(ii) Developing economies

FDI flows to developing economies as a group increased by 4 per cent to $916 billion in 2022. The increase was mainly the result of strong growth performance in Latin America and the Caribbean. FDI flows continue to be an important source of external finance for developing economies compared with other cross-border capital flows (figure I.6).

Figure I.7. **FDI inflows in Africa, by subregion, 2021–2022** (Billions of dollars)



Source: UNCTAD, FDI/MNE database (https://unctad.org/fdistatistics).

Africa

FDI flows to Africa fell by 44 per cent to $45 billion, following a record year in 2021 that was due to a single intrafirm financial transaction in South Africa (figure I.7). Excluding this deal, the change in FDI flows to Africa in 2022 would have increased by 7 per cent.

In North Africa, Egypt saw inflows more than double to $11 billion with increased cross-border M&A sales. Announced greenfield projects there more than doubled in number, to 161. And international project finance deals rose in value by two thirds, to $24 billion. Flows to Morocco decreased slightly, by 6 per cent, to $2.1 billion. Greenfield investment announced in that country quadrupled to $15 billion, with the plans by Total Eren (Luxembourg) to build a hydrogen and green ammonia production plant in Morocco for more than $10 billion.

In West Africa, Nigeria saw inflows turn negative, to -$187 million, due to equity divestments. However, the value of announced greenfield projects increased by 24 per cent. Among the largest were a data centre in Lekki announced by Airtel Nigeria, a subsidiary of Bharti Group (India), for $731 million and the construction of a 936 megawatt (MW) solar power plant and 443 megawatt-hour battery storage facility by Sun Africa (United States) and Niger Delta Power Holding (Nigeria), for $1.8 billion.

In Senegal, FDI flows remained flat at $2.6 billion. Announced greenfield project values more than doubled to $1.4 billion. The value of international project finance deals rose to $1.2 billion, with the largest deal being the development of a 300,000 m^3 per day reverse-osmosis plant for $671 million, sponsored by ACWA Power (Saudi Arabia) in collaboration with the National Water Company of Senegal. In early 2023, logistics company DP World (United Arab Emirates) committed $1.1 billion to port construction in Senegal. FDI flows to Ghana fell by 39 per cent to $1.5 billion. The value of announced greenfield projects remained flat at $1.3 billion, while international project finance deals, at $358 million, were down from $1.8 billion in 2021.

Flows to Central Africa fell by 7 per cent to $6 billion. FDI to the Democratic Republic of the Congo remained flat at $1.8 billion, with investment sustained by flows in offshore oil fields and mining. For example, Ivanhoe Mines (Canada) is to expand its Kamoa–Kakula copper mining complex for $2.9 billion.

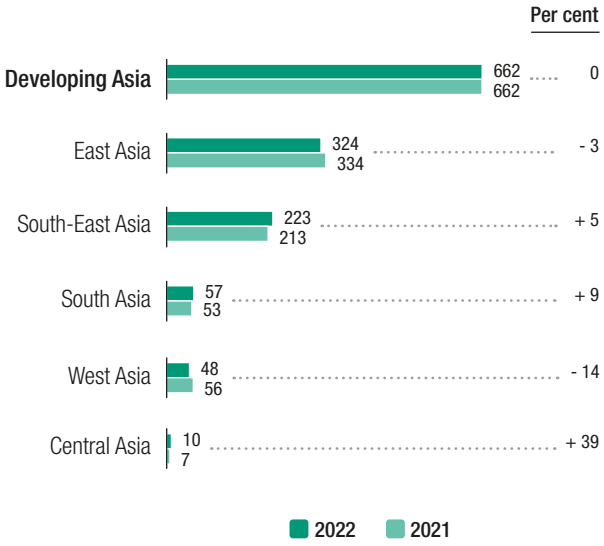
FDI to East Africa rose by 3 per cent to $8.7 billion. Flows to Ethiopia reached $3.7 billion – a 14 per cent decline from 2021. In Uganda FDI rose by 39 per cent to $1.5 billion. Two large greenfield projects were announced by TotalEnergies (France): the development of the Lake Albert oil field in a joint venture with China National Offshore Oil Corporation and the Uganda National Oil Company for $6.5 billion, and the construction of the 1,440-kilometre East African Crude Oil Pipeline in a $3.5 billion joint venture with the Uganda National Oil Company, the Petroleum Development Corporation (United Republic of Tanzania) and the China National Offshore Oil Corporation. FDI to the United Republic of Tanzania rose by 8 per cent to $1.1 billion; the number of announced greenfield projects in the country rose by 60 per cent; the number of international project finance deals also increased.

FDI to Southern Africa returned to normal levels, at $6.7 billion after the peak in 2021 caused by a one-off transaction. Flows to Angola remained negative (-$6.1 billion) as companies in the oil sector continued to pay back loans. FDI in South Africa reached $9.1 billion – double the average of the last decade. Cross-border M&As reached $4.8 billion from $280 million in 2021. Digital Titan (United States) acquired 55 per cent of TDE Investments, a Johannesburg-based provider of data processing and hosting services, for $1.7 billion. The value of greenfield projects rose fivefold to $27 billion. URB, a developer based in the United Arab Emirates, revealed plans for The Parks, a 17-square-kilometre project to build Africa's largest sustainable city; the $20 billion announcement was the third largest greenfield project worldwide in 2022. After one year of negative values, FDI to Zambia rose to $116 million. Flows to Mozambique registered at $2 billion, down from $5.1 billion in 2021, mainly due to negative intracompany loans.

The value of greenfield projects announced in Africa almost quadrupled, to a record $195 billion (from $52 billion in 2021). The number of projects also rose, by 39 per cent, to 766. The biggest increases were in energy and gas supply (to $120 billion), construction ($24 billion) and extractive industries ($21 billion). Six of the top 15 greenfield megaprojects announced in 2022 were in Africa.

In contrast, international project finance deals in Africa showed a decline of 47 per cent in value ($74 billion, down from $140 billion in 2021), but a 15 per cent increase in project numbers to 157. Decreases in values were registered in renewables, mining and power.

Figure I.8. FDI inflows in developing Asia, by subregion, 2021–2022
(Billions of dollars and per cent)



Source: UNCTAD, FDI/MNE database (https://unctad.org/fdistatistics).

European investors remain, by far, the largest holders of FDI stock in Africa, led by the United Kingdom ($60 billion), France ($54 billion) and the Netherlands ($54 billion).

Developing Asia

FDI flows to developing Asia remained flat at $662 billion (figure I.8). The region is the largest recipient of FDI, accounting for half of global inflows. The number of announced greenfield projects and international project finance deals in the region increased by 45 and 20 per cent, respectively.

In East Asia, FDI decreased by 3 per cent to $324 billion in 2022. Flows to China rose by 5 per cent, to a record $189 billion. The increase was concentrated in manufacturing and high-tech industries (mainly electronics and communication equipment) and came mostly from European MNEs. Cross-border M&A sales tripled to $15 billion. The largest deals were the $4 billion acquisition by BMW (Germany) of a further 25 per cent stake in BMW Brilliance Automotive, a Beijing-based manufacturer and wholesaler, and the $3.4 billion merger of COVA Acquisition (United States) and ECARX Holdings, a Shanghai-based manufacturer of semiconductors and electronics. A number of MNEs have been restructuring their global supply chains, with implications for FDI in China.

Flows to South-East Asia increased by 5 per cent to $223 billion – the highest level ever recorded. The values of announced greenfield projects and international project finance deals also increased, by 28 and 49 per cent, respectively. In contrast, the value of cross-border M&As fell by 75 per cent to $12 billion. Singapore, the largest recipient, registered another record, up 8 per cent to $141 billion (accounting for almost two thirds of flows to the Association of Southeast Asian Nations (ASEAN)). Flows to Malaysia rose by 39 per cent to $17 billion – a new record for the country. The number of both greenfield projects and project finance deals increased. The largest greenfield project announced was the plan by Bin Zayed International (United Arab Emirates) to invest $9.6 billion in developing a mixed-use real estate project in Langkasuka, following a joint venture with Widad Business Group (Malaysia). Flows to Viet Nam and Indonesia rose by 14 per cent and 4 per cent, to $18 billion and $22 billion, respectively. FDI to the Philippines fell by 23 per cent owing to acquisitions by local investors of foreign affiliates; for example, Union Bank of the Philippines acquired the Philippine consumer banking business of Citigroup (United States) for $1.4 billion.

In South Asia, FDI flows to India rose by 10 per cent to $49 billion, making it the third largest host country for announced greenfield projects and the second largest for international project finance deals. Among the largest greenfield projects were the plans by Foxconn (Taiwan Province of China) and Vedanta Resources (India) to build one of the first chip factories in India for $19 billion and a $5 billion project to produce urea from green hydrogen by a joint venture of TotalEnergies (France) and Adani Group (India). In project finance deals, Posco (Republic of Korea) and the Adani Group sponsored the construction of a steel mill for $5 billion in Gujarat.

In West Asia, FDI fell by 14 per cent to $48 billion, despite strong activity in greenfield projects and cross-border M&As. The number of greenfield projects rose to more than 1,800 – two thirds higher than 2021 – and the value of cross-border M&As increased by 18 per cent to

$37 billion. Flows to Saudi Arabia fell by 59 per cent to 7.9 billion. Cross-border M&A sales remained high. Among the largest deals was the $16 billion acquisition of a 49 per cent stake in Aramco Gas Pipeline by an investor group from the United States, China, Saudi Arabia and Hong Kong, China. Flows to the United Arab Emirates increased by 10 per cent to $23 billion – the highest ever recorded. The country received the fourth largest number of greenfield projects (997), an 84 per cent increase. Two of the largest projects included the building of a neutron therapy hospital, medical university and convention centre in Abu Dhabi by Star Energy (Austria) in a $1.8 billion joint venture with locally based Royal Strategic Partners and MIG Group, and the building of a $1 billion green hydrogen plant at Khalifa Industrial Zone in Abu Dhabi by Korea Electric Power (Republic of Korea). Flows to Türkiye rose by 9 per cent to $13 billion. Banco Bilbao Vizcaya Argentaria (Spain) acquired a stake in Türkiye Garanti Bankasi, an Istanbul-based commercial bank, for $1.5 billion.

Flows to Central Asia increased by 39 per cent to $10 billion. FDI to Kazakhstan almost doubled to $6.1 billion, with increases in the extractive industries (to $4.1 billion), mainly from MNEs in the Netherlands and the United States. Flows rose by 11 per cent to $2.5 billion in Uzbekistan.

Latin America and the Caribbean

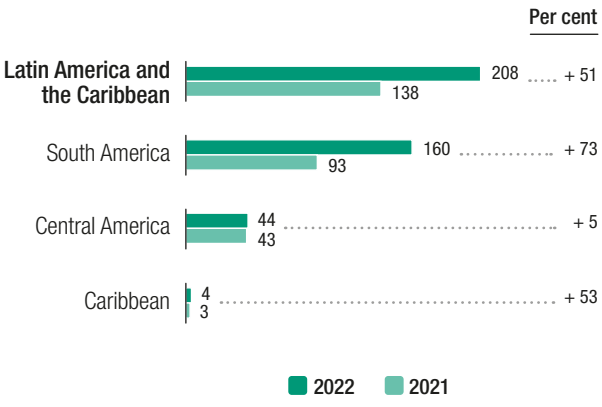
In 2022, FDI in Latin America and the Caribbean increased by 51 per cent to $208 billion, sustained by high demand for commodities and critical minerals (figure I.9).

In South America all major recipients saw their FDI flows rise, driven by investment in mining and hydrocarbons. In Brazil, flows rose by two thirds, reaching $86 billion, the second highest value ever recorded. Reinvested earnings doubled to $34 billion – a record. The number of announced greenfield projects and international project finance deals rose by almost 30 per cent, to 242 and 138, respectively. The country ranked fifth worldwide by number of international project finance deals. Large projects included the construction of a palm mill for $3 billion by Empresas Copec (Chile) and of the Rio-Valadares Highway in Brazil for $2.3 billion, sponsored by EcoRodovias (Brazil) and Logistica (Italy). FDI to Colombia grew by 82 per cent to $17 billion, led by extractives; construction; finance; and transport, logistics and communication services. FDI in Argentina and Peru doubled to $15 billion and $12 billion, respectively.

In Central America, FDI reached $44 billion – up 5 per cent from 2021. Flows to Mexico, the second largest recipient in Latin America, increased by 12 per cent to $35 billion, with a rise in new equity investment and reinvested earnings. The value of net cross-border M&A sales jumped to $8.2 billion (from less than $1 billion in 2021). A large deal was the acquisition by Univision Communications (United States) of the media, content and production assets of Grupo Televisa for $4.8 billion. The value of announced greenfield investment more than doubled to $41 billion. Tesla (United States) is planning to invest $5 billion in a plant in Mexico.

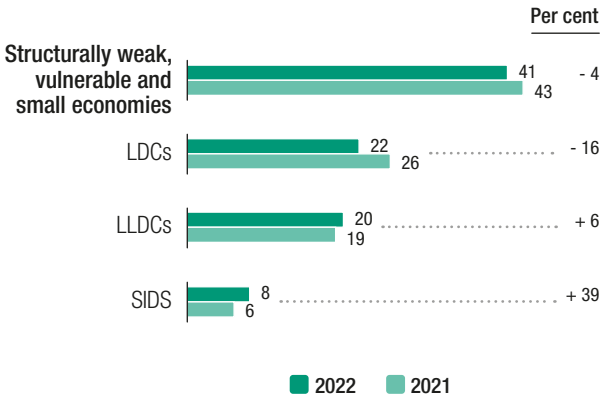
In the Caribbean, FDI increased by 53 per cent to $3.9 billion, mainly driven by growth in inflows to the Dominican Republic, to $4 billion.

Figure I.9. FDI inflows in Latin America and the Caribbean, by subregion, 2021–2022
(Billions of dollars and per cent)



Source: UNCTAD, FDI/MNE database (https://unctad.org/fdistatistics).

Figure I.10. **FDI inflows in structurally weak, vulnerable and small economies, 2021–2022** (Billions of dollars and per cent)



Source: UNCTAD, FDI/MNE database (https://unctad.org/fdistatistics).

Structurally weak, vulnerable and small economies

Flows to a group of 84 structurally weak, vulnerable and small economies declined by 4 per cent to $41 billion (figure I.10). Inflows to the least developed countries (LDCs), landlocked developing countries (LLDCs) and small island developing states (SIDS) combined accounted for 3.2 per cent of the world total in 2022, up from 2.9 per cent in 2021.

FDI in LDCs declined by 16 per cent to $22 billion. Flows remained concentrated, with the top five recipients (Ethiopia, Cambodia, Bangladesh, Senegal and Mozambique, in that order) accounting for about 70 per cent of the total. However, the picture is different for new project announcements. In international project finance the top recipients were Cambodia, Niger, the Lao People's Democratic Republic, the United Republic of Tanzania and the Sudan, in that order. For greenfield projects the top recipients were the United Republic of Tanzania, Bangladesh, Senegal, Cambodia and Rwanda.

FDI in the 33 African LDCs accounted for 58 per cent of all LDC inflows. Inflows exceeded $1 billion in seven of them. Ethiopia was the largest recipient of FDI in the group, with $3.7 billion – a 14 per cent decrease from 2021.

In the nine Asian LDCs, FDI inflows rose by 2 per cent to $9.2 billion. In Cambodia, FDI increased by 3 per cent to $3.6 billion. While greenfield project values remained small at only $661 million, there were 12 international project finance deals with a total value of $1.2 billion. An example is the construction of a hydropower plant located between Cambodia and Malaysia for $241 million, sponsored by PESTECH International (Malaysia) and Hydrogène de France (France).

Although the number and value of greenfield project announcements in LDCs increased in 2022, they remained depressed: they were below their 10-year average, at about half in number and a quarter in value. International project finance deals targeting LDCs decreased by 9 per cent in number and by 68 per cent in value to $20 billion.

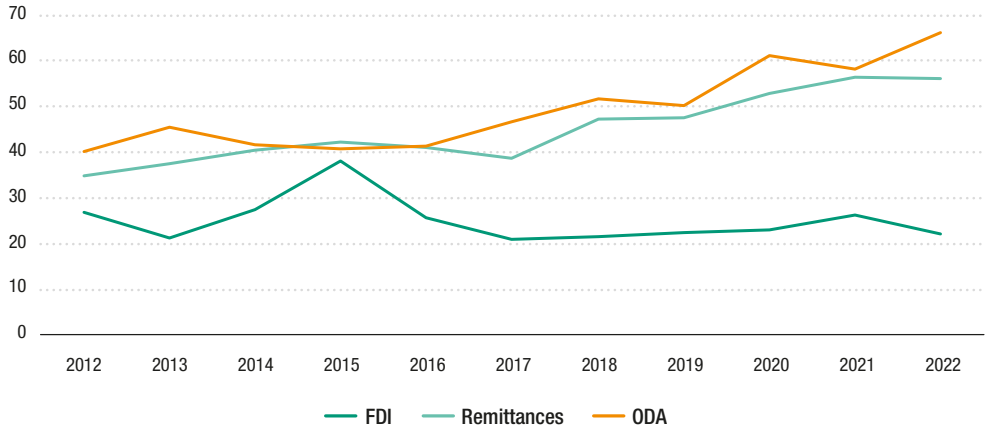
Investment activity in LDCs across sectors relevant for the attainment of the Sustainable Development Goals (SDGs) remained weak in 2022. The number of investment projects (both greenfield and international project finance deals) fell in important SDG sectors, including infrastructure, renewables and education. They rose in agrifood systems, WASH (water, sanitation and hygiene) and health.

The growth of FDI in LDCs has lagged that of other external sources of finance for most of the last decade. Official development assistance (ODA) and remittances were significantly higher. FDI flows remain, nonetheless, an important source of external finance for LDCs, crucial for their sustainable development and their graduation prospects (figure I.11).

FDI in the 32 *LLDCs* as a group rose by 6 per cent to $20 billion. Flows to LLDCs in Africa, Asia and Europe increased, while those to LLDCs in Latin America and the Caribbean fell. FDI remained concentrated in a few economies, with the top five recipients (Kazakhstan, Ethiopia, Uzbekistan, Mongolia and Uganda, in that order) accounting for 83 per cent of total FDI to the group.

In Africa, flows to LLDCs increased by 9 per cent to $8.2 billion, or 42 per cent of total FDI in the group. Although Ethiopia registered a decline, it remained the second largest LLDC recipient. FDI

Figure I.11. LDCs: FDI inflows, ODA and remittances, 2012–2022 (Billions of dollars)



Source: UNCTAD, based on FDI/MNE database (https://unctad.org/fdistatistics) (for FDI), World Bank (for remittances) and OECD (for ODA).

in Uganda increased by 39 per cent to $1.5 billion due to large projects in extractive industries. Flows to Niger declined slightly, but international project finance activity increased. The two largest projects were the construction of a 16 MW diesel processing facility, 15 MW battery storage facility and 16 MW solar power plant, sponsored by Enernet Global (United States), and a hydrogen project sponsored by Emerging Energy (Germany) and the Government of Niger.

The two Latin American LLDCs saw contrasting trends. Flows to Bolivia turned negative again (-$26 million), mainly due to the extraordinary payment of dividends in the hydrocarbon sector. However, other economic sectors showed increased investment. In Paraguay, flows more than doubled to $474 million. Two international project finance deals were announced in the country: a hydrogen project sponsored by Atome Energy (United Kingdom) and the construction of the Bioceanica bridge from Paraguay to Brazil, sponsored by Itaipu Binacional (Brazil) for $82 million.

Among the LLDCs in developing Asia, Kazakhstan saw FDI increase by 83 per cent to $6.1 billion. While equity turned negative, reinvested earnings reached $10 billion – the highest value ever recorded – boosted by high profits in the extractive industries. Flows to Uzbekistan reached a record $2.5 billion, mostly due to the doubling of reinvested earnings to $1.2 billion. Payment of dividends in the extractive industries caused FDI flows to Azerbaijan to turn negative, to -$4.5 billion.

Looking at the LLDCs as a group, the number of greenfield project announcements increased by 15 per cent (the value tripled to $31 billion). The increase was particularly pronounced in extractive industries. The number of international project finance deals was 19 per cent lower than in 2021. The majority of projects targeted renewables, but projects were also announced in other sectors, including power, mining and industrial real estate.

FDI inflows to the *SIDS* rose by 39 per cent to $7.8 billion in 2022 – about 0.6 per cent of global FDI. Reflecting differences in levels of development and factor endowments, a handful of SIDS continued to attract the bulk of inflows. The top five recipients (the Dominican Republic, the Bahamas, Maldives, Jamaica and Timor-Leste, in that order) accounted for 85 per cent of FDI flows to the group.

Inflows to the 11 Caribbean SIDS rose by 27 per cent to $5.9 billion, due to some recovery in international tourism investment. FDI flows in the Dominican Republic rose by 25 per cent to $4 billion. The number of greenfield projects more than doubled to 30, and the value more than quadrupled to $3.5 billion. In the Bahamas, inflows rose by 6 per cent to $1.3 billion,

mainly due to intracompany loans. FDI to Jamaica increased by 12 per cent to $360 million. Flows to Trinidad and Tobago were negative, at -$0.5 billion, but there were several greenfield project announcements. The largest was the development of a solar project with a capacity of 148 MW of DC power and output of 112 MW of AC power by Shell Renewables Caribbean (Netherlands) and Lightsource (United Kingdom) for $180 million.

FDI in the two Asian SIDS turned positive to $984 million. In Maldives, FDI inflows rose by 12 per cent, to $722 million. In Timor-Leste, flows reached $262 million after registering negative values for the last three years.

Among the five African SIDS, Mauritius saw its FDI flows remain flat at $252 million. In Seychelles, FDI flows fell by 6 per cent (to $212 million). Masdar, a renewable energy company and a subsidiary of Mubadala Development (United Arab Emirates), entered a joint venture with Seychelles-owned Public Utilities Corporation to open a 5 MW solar photovoltaic plant for $181 million.

Among the 11 SIDS in Oceania, Fiji, the largest host country, saw FDI down by 74 per cent to $104 million. However, there were several greenfield project announcements in 2022 with a total value of $41 million, a significant increase from 2021.

b. FDI outflows

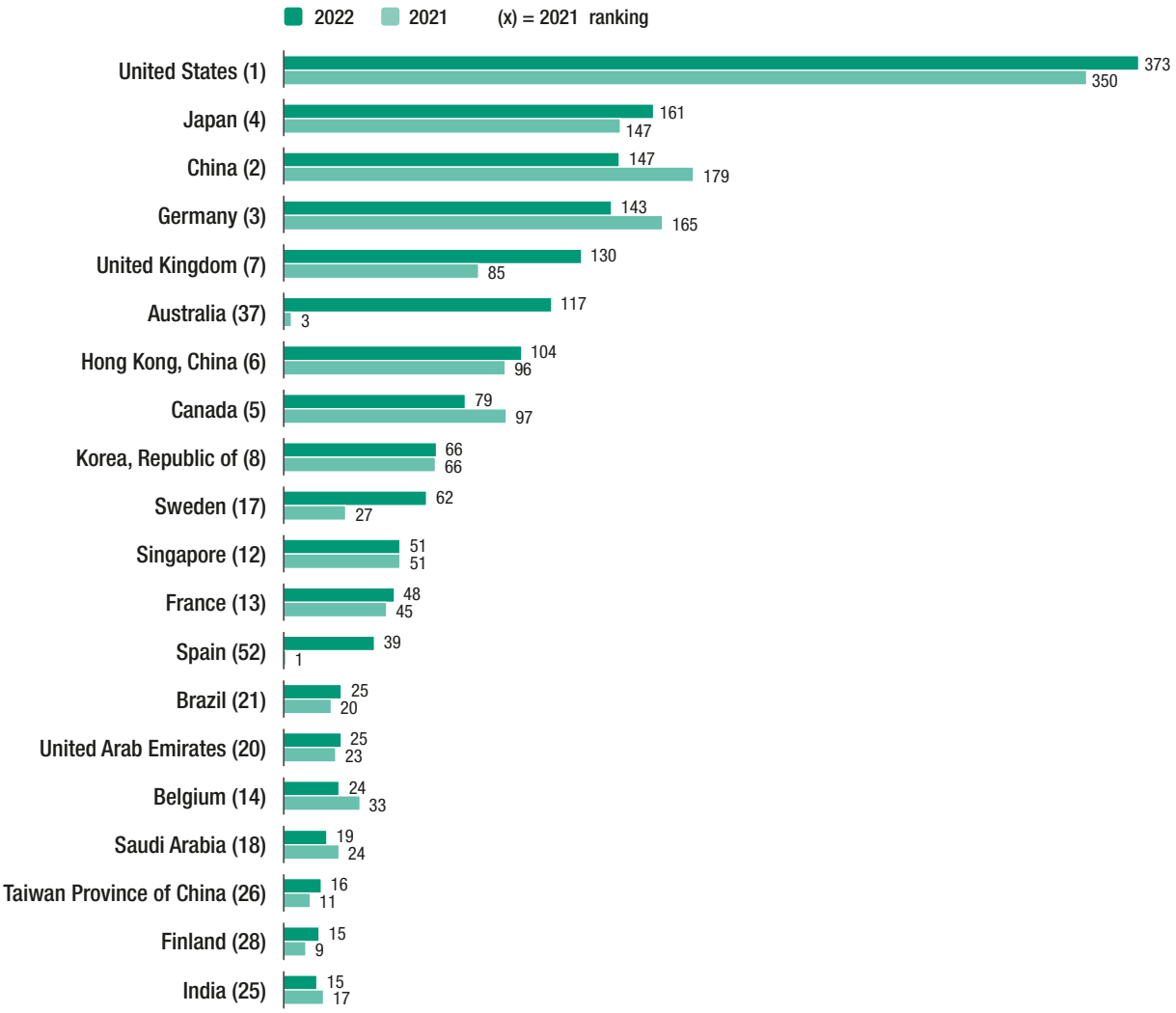
In 2022, MNEs from developed economies decreased their investment abroad by 17 per cent to $1 trillion. The trend was distorted by the withdrawal of capital by a telecommunication company in Luxembourg (excluding that, FDI outflows would have increased by 9 per cent). The share of developed economies in global outward FDI remained stable, at two thirds.

Aggregate outward investment by European MNEs fell by 61 per cent to $224 billion, down from $573 billion in 2021. Investment by German MNEs declined by 13 per cent, but at $143 billion they remained the largest European investors and the fourth largest country group in the world (figure I.12). Investment by Swedish MNEs tripled to $62 billion, reflecting a large increase in cross-border M&As. Deals included EQT's purchase of Baring Private Equity Asia (Hong Kong, China) for $7.6 billion and the merger of Telefonaktiebolaget LM Ericsson with Vonage Holdings (United States) for $5.7 billion. MNEs from Spain and France increased investment to $39 billion and $48 billion, respectively. MNEs from the United Kingdom increased FDI abroad to $130 billion, from $85 billion in 2021, mainly in the form of reinvested earnings and a rise in intracompany loans. Outward FDI flows from Switzerland remained negative (-$23 billion).

MNEs from the United States increased their investment abroad by 7 per cent, to $373 billion. Cross-border M&A purchases from the United States rose by 21 per cent to a record $273 billion. The biggest increases were in information and communication and in administrative and support services. Among more than 40 global deals worth more than $5 billion, 15 originated in the United States.

Japanese and Australian MNEs increased overseas investment as well. Outflows from Japan rose by 10 per cent to $161 billion – making it the second largest investor country. Announced greenfield projects rose by 47 per cent to $44 billion, while cross-border M&As declined from $60 billion to $6.2 billion. Outflows from Australia rose from $3.4 billion to $117 billion, mainly due to the acquisition of BHP (United Kingdom) from BHP (Australia). MNEs from the Republic of Korea continued their investment abroad at a similar rate as in 2021, at $66 billion, with the value of announced greenfield projects increasing for the second year in a row, from $34 billion to $76 billion.

Figure I.12. FDI outflows, top 20 home economies, 2021 and 2022 (Billions of dollars)



Source: UNCTAD, FDI/MNE database (https://unctad.org/fdistatistics).

The value of investment activity abroad by MNEs from developing economies decreased by 5 per cent, to $459 billion. Flows from developing Asia fell by 11 per cent, but the region remained an important source of investment, accounting for a quarter of global FDI. FDI from China fell by 18 per cent to $147 billion. Nevertheless, it was the third largest investor home-country in the world (see figure I.12). The value of cross-border M&A purchases rose to $10 billion from $1 billion, and announced greenfield FDI reached $41 billion, a 24 per cent increase. The largest greenfield announcements by Chinese MNEs were in the battery supply chain: Chinese Contemporary Amperex Technology is to set up its second European plant in Hungary, worth about $7.5 billion, while Gotion High Tech is set to build new electric-vehicle battery plants in the United States worth a combined $2.4 billion.

Outward investment by Indian MNEs fell by 16 per cent to $15 billion. However, greenfield project announcements by Indian MNEs more than tripled to $42 billion. Two of the largest greenfield projects were in renewables, with Acme Group announcing a $13 billion plant in Egypt to produce 2.2 billion tonnes of green hydrogen annually and ReNew Power announcing that it will set up a $8 billion green hydrogen plant in the Suez Canal Economic Zone.

Overseas investment by MNEs in ASEAN rose by 6 per cent, mainly due to the increase of FDI from Malaysia (from $5 billion to $13 billion) and Indonesia (from $4 billion to $7 billion).

Both cross-border M&A purchases and greenfield projects announced by Malaysian MNEs rose. Petronas Chemicals Group (Malaysia) acquired Perstorp Holding (Sweden) for $2.6 billion, and Petronas Hydrogen committed to invest $3.8 billion in India to set up a renewable energy plant. Singaporean MNEs remained the largest investor in the region, with outward FDI of $51 billion – the same value as in 2021.

Outward FDI from Latin America and the Caribbean continued its upward trend to $59 billion. FDI outflows from Mexico turned positive to $13 billion from -$2 billion in 2021. Investment by Brazilian MNEs rose by 23 per cent to $25 billion. Flows from Chile also grew, by 4 per cent to $12 billion.

3. Trends by type and sector

In 2022, international project finance deals and cross-border M&As were affected by the war in Ukraine, deteriorating financing conditions and uncertainty in financial markets. The value of project finance deals fell by 25 per cent and cross-border M&A sales by 4 per cent. The number of net cross-border M&As also fell by 9 per cent, while the number of project finance deals rose by 8 per cent (figure I.13). In contrast, announced greenfield projects rose by 15 per cent due to continued momentum in the first part of the year. The value of projects increased by 64 per cent because of several megaprojects.

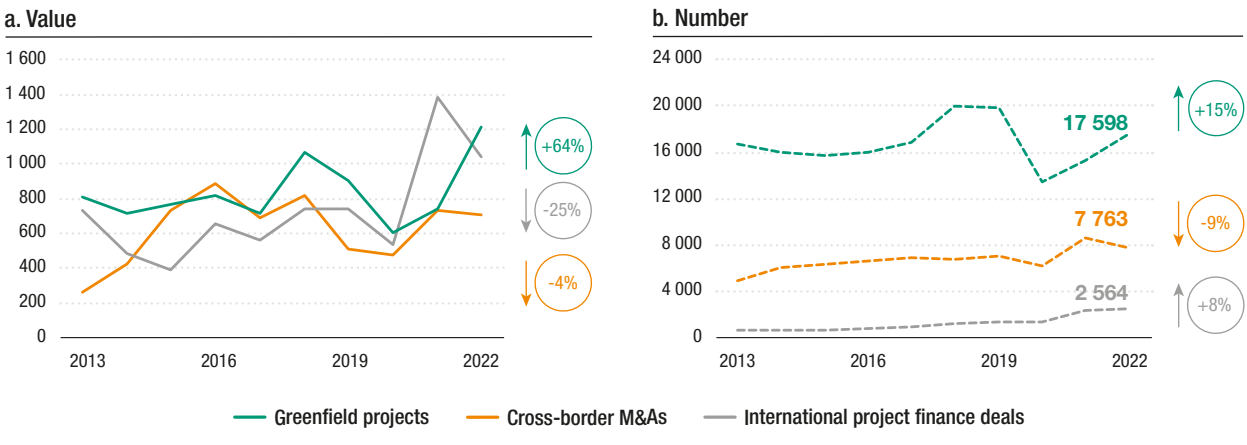
a. Project types

(i) Greenfield investment trends

In 2022, the value of announced greenfield investment projects rose by 64 per cent to $1.2 trillion – the second highest level recorded since 2008. It more than doubled in developing economies to $573 billion (with project numbers up 37 per cent) and rose by 37 per cent in developed countries (with project numbers up 4 per cent).

The sectoral distribution of greenfield megaprojects announced in 2022 illustrates key trends in cross-border investment. Of the 10 largest announced projects, 3 were in semiconductors, in response to global shortages and supply chain restructuring trends, and 5 were in renewables.

Figure I.13. **Value and number of announced greenfield projects, international project finance deals and cross-border M&As, 2013–2022** (Billions of dollars, number and per cent)



Source: UNCTAD, based on information from the Financial Times Ltd, fDi Markets (fDimarkets.com) and Refinitiv SA.

Table I.5. Announced greenfield projects, by sector and top industries, 2021–2022
(Billions of dollars, number and per cent)

Sector/industry	Value (Billions of dollars) 2021	Value (Billions of dollars) 2022	Growth rate, 2021–2022 (%)	Number 2021	Number 2022	Growth rate, 2021–2022 (%)
Total	**739**	**1 213**	**64**	**15 318**	**17 598**	**15**
Primary	13	97	618	103	118	15
Manufacturing	320	437	37	5 934	5 970	1
Services	406	679	68	9 281	11 510	24
Top 10 industries in value terms						
Energy and gas supply	141	362	157	518	556	7
Electronics and electrical equipment	138	181	31	1 100	1 167	6
Information and communication	106	120	14	3 887	5 024	29
Extractive industries	12	95	718	59	89	51
Construction	49	62	27	332	211	-36
Automotive	39	59	53	718	694	-3
Transportation and storage	36	56	58	765	978	28
Basic metal and metal products	12	43	249	228	225	-1
Chemicals	23	26	12	456	474	4
Finance and insurance	15	22	46	727	1 032	42

Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fDimarkets.com).

Also emblematic for global investment trends and the effects of the energy crisis was the eightfold increase in the value of greenfield projects in extractive industries. The number of projects increased by 15 per cent (table I.5). The largest included a $10 billion investment by ExxonMobil (United States) in a fourth oil production project off the coast of Guyana, a $7.5 billion extension of the oil extraction activity of Emirates National Oil Company (United Arab Emirates) in Turkmenistan and Saudi Aramco's plans to invest in a $7 billion project to produce petrochemicals from crude oil at its refining complex in the port city of Ulsan in the Republic of Korea.

The value of projects in manufacturing rose by 37 per cent to $437 billion – a quarter above the average of the last 10 years. The number of projects, however, remained stagnant at 5,970.

The increase in the number of greenfield project announcements was mostly driven by services, which now account for two thirds of all projects – the highest share on record. The value of greenfield projects in services also reached record highs.

(ii) International project finance trends

In 2022, the number of international project finance deals rose by 8 per cent, but their value was 25 per cent lower than in 2021 (table I.6). International project finance in renewable energy, which has accounted for much of the growth in project finance in recent years, slowed down. While the number of deals remained stable, values fell by almost 30 per cent to $368 billion. Large projects included the $15 billion construction of floating marine wind farms in Italy by Falck Renewables (Italy) and Bluefloat Energy (Spain), and the construction of a 4,000 MW offshore wind power plant in Binh Thuan, Viet Nam by AES (United States) for $13 billion.

Table I.6. Announced international project finance deals, top industries, 2021–2022
(Billions of dollars, number and per cent)

Industry	Value (Billions of dollars) 2021	2022	Growth rate (%)	Number 2021	2022	Growth rate (%)
Total	**1 384**	**1 044**	**-25**	**2 383**	**2 564**	**8**
Top 10 industries by number						
Renewable energy	521	368	-29	1 274	1 293	1
Industrial real estate	184	188	2	181	270	49
Residential/commercial real estate	42	48	14	190	223	17
Power	222	120	-46	152	178	17
Telecommunication	84	78	-8	95	118	24
Oil and gas	152	67	-56	126	105	-17
Transport infrastructure	53	44	-17	98	93	-5
Mining	42	42	-1	126	78	-38
Petrochemicals	55	54	-2	62	73	18
Waste and recycling	3	8	124	16	38	138

Source: UNCTAD, based on information from Refinitiv SA.

The number of international project finance deals in industrial real estate has grown for the last two years. In 2022, deal numbers rose further by 49 per cent, to 270 projects, with a value of $188 billion. The number of deals targeting residential and commercial real estate also increased, by 17 per cent, to 223. International project finance in the oil and gas industry in 2022 fell by 17 per cent in number and 56 per cent in value, showing that much of the activity in the sector has shifted to corporate-financed greenfield investment.

(iii) Cross-border M&A trends

Cross-border M&A sales reached $707 billion in 2022 – down 4 per cent (table I.7). In manufacturing, cross-border M&As fell by 42 per cent to $142 billion, while deals targeting services decreased slightly, by 5 per cent, to $442 billion. In the primary sector, M&A values more than quadrupled to $122 billion, breaking the decade-long downward trend.

After the rise in value in 2021, M&A sales in pharmaceuticals fell by 51 per cent to $36 billion, while the number of deals dropped by 22 per cent to 169. The largest deal of the year was recorded in the pharmaceutical industry: the $11 billion acquisition of Vifor Pharma (Switzerland) by CSL Behring (Australia) and the purchase of the biosimilars business of Viatris (United States) by Biocon Biologics (India) for $3.3 billion.

Table I.7. Net cross-border M&As, by sector and top industries, 2021–2022 (Continued)
(Billions of dollars, number and per cent)

Sector/industry	Value (Billions of dollars) 2021	2022	Growth rate (%)	Number 2021	2022	Growth rate (%)
Total	**737**	**707**	**-4**	**8 571**	**7 763**	**-9**
Primary	27	122	357	623	389	-38
Manufacturing	246	142	-42	1 608	1 406	-13
Services	465	442	-5	6 340	5 968	-6

/…

Table I.7. Net cross-border M&As, by sector and top industries, 2021–2022 (Concluded)
(Billions of dollars, number and per cent)

Sector/industry	Value (Billions of dollars) 2021	2022	Growth rate (%)	Number 2021	2022	Growth rate (%)
Top 10 industries in value terms						
Information and communication	135	166	23	2 045	1 799	-12
Extractive industries	25	121	387	420	216	-49
Finance and insurance	75	88	17	714	602	-16
Transportation and storage	53	41	-23	313	297	-5
Pharmaceuticals	73	36	-51	218	169	-22
Electronics and electrical equipment	39	29	-27	299	243	-19
Trade	64	27	-58	643	592	-8
Professional services	38	23	-39	666	730	10
Food, beverages and tobacco	10	21	116	197	157	-20
Real estate	34	20	-42	409	336	-18

Source: UNCTAD, based on information from Refinitiv SA.

b. Selected industries

(i) Infrastructure

In 2022 the combined number of greenfield project announcements and international project finance deals in infrastructure industries rose by 6 per cent, but the value fell by 4 per cent (table I.8). The decline in value was largely driven by lower investment in power after the boom in 2021. Also, deteriorating financing conditions in 2022 caused a slowdown in high-value international project finance deals, normally the preferred financing option for large projects in infrastructure. The effects of large-scale public support packages for infrastructure investment were still noticeable in high values of announced greenfield projects.

The number of greenfield projects in renewables rose by 6 per cent to 531. The value of projects more than doubled; COP27 motivated several investors to announce large plans. Other large projects announced in renewables included plans by POSCO (Republic of Korea), a steel producer, to invest $28 billion in green hydrogen manufacturing in Australia and plans by Marubeni (Japan) to develop the 3.6 gigawatt (GW) Ossian offshore wind farm off the east coast of Scotland for $12 billion.

The number of international project finance deals in transport infrastructure fell by 5 per cent, and values decreased by 17 per cent to $44 billion. The number of projects rose in Europe and developing Asia and fell in North America and in Latin America and the Caribbean. International project finance deals in telecommunication infrastructure rose by 24 per cent to 118 – a record level and several times the average of the last 10 years. Most of the projects were in information technology, personal communications networks and transmission lines. The bulk of projects were in developed economies, mainly in Europe (57 projects). Among the largest projects were the acquisition by GD Towers of mobile telecommunication towers located in Germany and Austria for $11 billion, sponsored by DigitalBridge Group (Canada), and a fibre-optic expansion project in Germany for $6.9 billion, sponsored by Vodafone Group (United Kingdom) and Altice Group (France).

Table I.8. Infrastructure: announced investment projects, 2020–2022 (Millions of dollars, number and per cent)

Sector/industry	Greenfield projects				International project finance deals			
	2020	2021	2022	Growth rate, 2021–2022 (%)	2020	2021	2022	Growth rate, 2021–2022 (%)
Infrastructure								
Value	**206 037**	**244 039**	**470 120**	**93**	**342 196**	**880 962**	**609 778**	**-31**
Number of projects	**1 855**	**2 149**	**2 304**	**7**	**1 011**	**1 619**	**1 682**	**4**
Power[a]								
Value	11 828	5 271	8 552	62	30 024	222 177	119 596	-46
Number of projects	51	49	49	0	60	152	178	17
Renewable energy								
Value	110 404	135 971	353 602	160	230 374	521 414	368 306	-29
Number of projects	527	501	531	6	847	1 274	1 293	1
Transport[b]								
Value	26 416	34 822	52 215	50	41 990	53 433	44 245	-17
Number of projects	638	759	969	28	55	98	93	-5
Telecommunication[c]								
Value	57 389	67 976	55 750	- 18	39 808	83 938	77 631	-8
Number of projects	639	840	755	- 10	49	95	118	24

Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fDimarkets.com) and Refinitiv SA.
[a] Excluding renewable energy.
[b] Transport services for greenfield projects and transport infrastructure for project finance.
[c] Including information services activities.

(ii) GVC-intensive industries

Investment projects in global value chain (GVC)-intensive industries, where investment trends are affected by exposure to supply-chain risks and restructuring pressures, rose by 5 per cent in number and by 34 per cent in value (table I.9). The number of announced greenfield projects in electronics and electrical equipment rose by 6 per cent. Global shortages for semiconductors prompted several investment megaprojects. Three of the five largest projects announced in 2022 were in semiconductors: Taiwan Semiconductor Manufacturing (Taiwan Province of China) intends to spend more than $28 billion in developing advanced chips and building plant capacity in the United States; Foxconn (Taiwan Province of China) and Vedanta Resources (India) are planning to build one of the first chip factories in India for $19 billion; and Intel (United States) has committed to investing a further $13 billion in its Irish operations.

The value of greenfield projects in the automotive sector rose by 53 per cent, mainly due to projects in electric vehicles. For example, Hyundai (Republic of Korea) plans to spend $5.5 billion to build its first dedicated electric vehicle and battery manufacturing facilities in the United States. Volkswagen (Germany) plans to spend $3.3 billion in the United Kingdom for Bentley, its subsidiary, to build its first battery-powered electric vehicle; it will spend a further $1.9 billion in Spain for SEAT to do the same.

Table I.9. GVC-intensive industries: announced greenfield projects, 2020–2022
(Millions of dollars, number and per cent)

Sector/industry	2020	2021	2022	Growth rate, 2021–2022 (%)
GVC-intensive industries				
Value	**101 373**	**197 388**	**264 813**	**34**
Number of projects	**2 796**	**3 232**	**3 402**	**5**
Electronics and electrical equipment				
Value	47 714	137 928	180 928	31
Number of projects	888	1 100	1 167	6
Semiconductors				
Value	*16 381*	*84 575*	*91 608*	*8*
Number of projects	*55*	*111*	*140*	*26*
Automotive				
Value	35 096	38 567	58 949	53
Number of projects	578	718	694	-3
Machinery and equipment				
Value	7 238	8 061	12 224	52
Number of projects	670	650	727	12
Textiles, clothing and leather				
Value	11 326	12 833	12 712	-1
Number of projects	660	764	814	7

Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com).

(iii) Digital industries

Typically, digital MNEs engage less in greenfield investment, with most of their investment abroad relating to acquisitions of competitors or valuable start-ups. E-commerce companies are the exception; they need to set up networks of warehouses and distribution facilities. The pandemic-induced boom in e-commerce investment activities remained visible in 2022, although at a slower pace. The number of projects declined by 20 per cent but remained high compared with previous years (table I.10). Much of the decline was accounted for by e-commerce giant Amazon (United States), which announced half as many projects as in 2021; however, the total value at $18 billion was only slightly lower than in 2021. The largest deals included the launching of new services infrastructure in Europe, based in Switzerland, for $5.9 billion, and cloud infrastructure in Thailand for $5 billion.

Internet platforms were also active in greenfield investment in 2022, with a 6 per cent rise in project numbers causing values to double to $6.3 billion. Most of this was accounted for by the largest platforms, Alphabet (United States) and Meta (United States). While Alphabet has been active for some years, with an annual average of $3 billion spent over the last three years, Meta's overseas greenfield investment jumped from $103 million in 2021 to $2.7 billion in 2022. Examples included a $1.5 billion investment in a research and development (R&D) project in Canada and a $1 billion new data centre in Spain.

Table I.10. Digital industries: announced greenfield projects, 2020–2022
(Millions of dollars and per cent)

	2020	2021	2022	Growth rate, 2021–2022 (%)
Digital industries				
Value	**21 211**	**31 172**	**32 057**	**3**
Number of projects	**306**	**376**	**338**	**- 10**
Digital content				
Value	506	1 804	506	- 72
Number of projects	30	43	37	- 14
Digital solutions				
Value	1 206	2 962	2 929	- 1
Number of projects	38	48	59	23
E-commerce				
Value	15 214	23 837	22 368	- 6
Number of projects	199	231	185	- 20
Internet platforms				
Value	4 285	2 569	6 254	143
Number of projects	39	54	57	6

Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com).
Note: For the classification of digital industries, see *WIR17*.

B. SDG INVESTMENT

1. Investment trends

a. Overview of SDG investment sectors

The number of international investment projects announced in developing countries in sectors relevant to the Sustainable Development Goals (SDGs) increased substantially in 2022. However, the growth is unbalanced, with some SDG sectors showing only slow progress; it is highly uneven, with negative trends in LDCs and stagnation in many other developing countries; and growth prospects remain fragile because of the expected downward pressures on overall FDI in 2023.

Moreover, international investment activity in SDG sectors in developing countries is still catching up after slow or negative growth in the early period, after the adoption of the SDGs in 2015. The increase in investment since 2015, as measured by the number of greenfield projects and international project finance deals, is limited for most sectors; one sector (agrifood systems) even shows lower investment activity in 2022 than in 2015 (table I.11). At the midpoint of the 2030 Agenda for Sustainable Development, the lack of progress in amplifying international investment activity in SDG sectors is a major concern.

In 2022, the combined value of SDG-relevant greenfield investment and international project finance in developing countries reached $471 billion, up from $290 billion in 2015. The number of international investment projects in infrastructure (which comprises transport infrastructure, power generation and distribution) and telecommunication saw the highest growth (26 per cent), followed by the water, sanitation and hygiene (WASH) sector (20 per cent). International investment in agrifood sectors, including fertilizers, remained stagnant at low levels.

Table I.11. International private investment in the SDGs: change in number of projects, 2021–2022 and 2015–2022 (Per cent)

		2021–2022	2015–2022
Infrastructure Transport infrastructure, power generation and distribution (except renewables), telecommunication		+26%	+16%
Renewable energy Installations for renewable energy generation, all sources		+8%	+21%
WASH Provision of water and sanitation to industry and households		+20%	+13%
Agrifood systems Agricultural production and processes; fertilizers, pesticides and other chemicals; R&D; technology		+6%	-19%
Health and education Hospital facilities, school buildings and other infrastructure for service delivery		+8%	+11%

Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fDimarkets.com) and Refinitiv SA.
Note: Includes announced greenfield investment and international project finance deals.

Recent investment trends among the LDCs stand in stark contrast to those in other developing countries. In LDCs, cross-border investment in SDG sectors has not yet recovered from the shockwaves of the pandemic. Both the number and the value of projects have been in decline since 2020. In 2022, LDCs received the smallest ever share of SDG-relevant investment projects within the broader developing countries group, dropping from 6.4 per cent in 2021 to 5.1 in 2022 (tables I.12 and I.13). The LDC share saw an even sharper decline in value terms, dropping from 12 per cent in 2021 to 5 per cent in 2022. Project numbers in the last two years were significantly lower in most sectors, except for renewables and WASH, than in 2015.

Cross-border investment in the power sector remained relatively stable in 2022. Greenfield project announcements decreased, while the number of international project finance deals increased marginally. Investment values declined sharply, but this is explained by some exceptionally large international project finance deals registered in 2021 (table I.14). Investment in renewable energy continued at high levels, but growth slowed down compared with 2021.

Table I.12. SDG sectors: announced greenfield projects in developing economies, 2020–2022
(Millions of dollars and per cent)

SDG-relevant sector	Developing economies				LDCs			
	2020	2021	2022	Growth rate, 2021–2022 (%)	2020	2021	2022	Growth rate, 2021–2022 (%)
Total								
Value	**99 927**	**113 607**	**242 959**	**114**	**11 067**	**8 428**	**8 358**	**- 1**
Number of projects	**1 155**	**1 296**	**1 540**	**19**	**85**	**69**	**61**	**- 12**
Power[a]								
Value	10 800	4 175	3 939	- 6	3 452	2 000	1 717	- 14
Number of projects	23	20	16	- 20	4	1	2	100
Renewable energy								
Value	38 523	52 739	162 505	208	3 758	3 337	3 970	19
Number of projects	191	146	176	21	21	9	11	22
Transport services								
Value	9 488	12 945	21 591	67	1 077	449	784	74
Number of projects	183	271	431	59	17	22	18	- 18
Telecommunication[b]								
Value	24 614	21 592	23 179	7	2 190	1 764	858	- 51
Number of projects	243	291	321	10	22	20	11	- 45
Water, sanitation and hygiene (WASH)								
Value	566	4 128	1 631	- 60	-	136	150	10
Number of projects	7	19	15	- 21	-	1	1	0
Agrifood systems								
Value	11 287	11 750	19 838	69	479	426	704	65
Number of projects	293	274	280	2	12	7	13	86
Health								
Value	3 776	5 137	9 350	82	77	180	168	- 7
Number of projects	151	190	207	9	5	3	4	33
Education								
Value	874	1 140	926	- 19	33	136	7	- 95
Number of projects	64	85	94	11	4	6	1	- 83

Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com).
[a] Excluding renewable energy.
[b] Including information services activities.

Table I.13. SDG sectors: announced international project finance deals in developing economies, 2020–2022 (Millions of dollars and per cent)

SDG-relevant sector	Developing economies				LDCs			
	2020	2021	2022	Growth rate, 2021–2022 (%)	2020	2021	2022	Growth rate, 2021–2022 (%)
Total								
Value	**141 475**	**370 241**	**228 286**	**- 38**	**31 307**	**51 189**	**15 828**	**- 69**
Number of projects	**381**	**603**	**642**	**6**	**50**	**53**	**50**	**- 6**
Power[a]								
Value	23 123	105 667	48 213	- 54	4 092	42 811	1 811	- 96
Number of projects	37	57	60	5	7	7	7	-
Renewable energy								
Value	86 661	205 648	123 338	- 40	12 885	4 508	5 891	31
Number of projects	291	420	438	4	34	32	24	- 25
Transport infrastructure								
Value	23 344	28 624	25 708	- 10	13 977	2 963	4 858	64
Number of projects	24	57	53	- 7	7	6	6	-
Telecommunication[b]								
Value	4 863	18 345	12 263	- 33	-	527	319	- 39
Number of projects	9	32	37	16	-	3	4	33
Water, sanitation and hygiene (WASH)								
Value	1 486	1 159	13 247	1 043	354	138	1 001	623
Number of projects	13	11	21	91	2	2	5	150
Agrifood systems								
Value	1 851	8 137	4 424	- 46	-	-	1 932	..
Number of projects	4	10	20	100	-	-	3	..
Health								
Value	129	2 255	524	- 77	-	-	16	..
Number of projects	2	7	5	- 29	-	-	1	..
Education								
Value	18	406	569	40	-	242	-	..
Number of projects	1	9	8	- 11	-	3	-	..

Source: UNCTAD, based on information from Refinitiv SA.
[a] Excluding renewable energy.
[b] Including information services activities.

In transport infrastructure, international project finance declined by 7 per cent in project numbers and 10 per cent in value. Major projects included the South Western Railway Kadur–Chikkamagalur–Belur project in India, and the Sao Paulo Electric Bus Portfolio project in Brazil.

The telecommunication sector showed an overall increase in the number of projects in 2022. In this sector, LDCs still account for a minor share of investment, just 15 projects out of 358 in developing countries. Only 10 LDCs (Angola, Ethiopia, Myanmar, Niger, Rwanda, Senegal, Solomon Islands, Somalia, the United Republic of Tanzania and Zambia) registered international investment projects in the sector in the form of wired or wireless telecommunication infrastructure or data processing and hosting services. With only a minority of the population in LDCs having access to the internet, the contribution of international investment to SDG 9 (access to information and communication technology, and universal and affordable Internet coverage) remains limited.

In the WASH sector, which embraces SDG 6 (universal access to safe drinking water, sanitation and hygiene), public sources of finance account for most investment. After a

Table I.14. SDG sectors: top three projects in developing countries announced in 2022 (Millions of dollars)

SDG sector	Country	Project name	Cost estimate ($ million)
Power	South Africa	South Africa Green Hydrogen Project	10 000
	Egypt	ReNew Suez Canal Economic Zone Green Hydrogen Plant Project	8 000
	Thailand	Thailand Green Hydrogen and Ammonia Plant Project	7 000
Renewable energy	Viet Nam	AES Binh Thuan Offshore Wind Farm Project	13 000
	Brazil	Ceara Costa Nordeste Offshore Wind Farm Project	9 462
	China	CSI Solar Haidong New Energy Whole Industry Chain Project	8 874
Transport infrastructure	Sudan	Abu Amama Port Project	4 000
	Ghana	Ghana Western Railway Line Project	3 200
	Cambodia	Kampot Logistics & Port Changhon Village Multipurpose Port & Logistic Center Project	1 500
Telecommunication	Malaysia	YTL Green Data Center Park Project	3 497
	Singapore	East to Med Data Corridor Project	850
	Brazil	Infovia Digital Fibre Optic PPP Project	438
Water, sanitation and hygiene (WASH)	Mexico	IDE Technologies Desalination Facility and Pipeline Project	5 000
	Indonesia	Moya Indonesia Jakarta Water Supply and Treatment Project	1 747
	Egypt	400 MW Egypt Solar-Powered Desalination Plant Project	1 500
Agrifood systems	Sudan	Sudan Agricultural Project	1 600
	Malaysia	FGV Chuping Agro Valley Integrated Dairy Farming Project	1 074
	Morocco	Morocco Dakhla Agriculture Project	213
Health	China	Chimigen Biomedical Chengdu Global Headquarters and Infection Tumor Disease Vaccine R&D Center Project	168
	China	Sartorius Chengdu Laboratory and Service Center Project	168
	India	SMS Hyderabad Particle Characterization Laboratory Project	160
Education	Azerbaijan	USACE Deymedaghildi Village School Project	88
	Azerbaijan	Kurmangazy Creativity Development Centre Project	88
	Côte d'Ivoire	Ivorian Vocational Training School Project	81

Source: UNCTAD, based on information from Refinitiv SA.

spike in 2021, greenfield investment declined in 2022 but remained above the 2020 values. International project finance deals doubled in number and value. A significant share was in desalination projects, which address water scarcity and are important in the context of climate change adaptation.

Health and education are relatively marginal sectors for FDI. In 2022, China announced two of the largest projects in the health sector, the Chimigen Biomedical global headquarters in Chengdu and the Sartorius Chengdu Laboratory and Service Center project. Other project examples included the construction of a new treatment building at the National Pediatric Hospital in Cambodia.

b. Investment in agrifood systems

Food price inflation and the impact of the war in Ukraine on commodity prices have exacerbated food insecurity in developing economies, especially in some of the poorest and most vulnerable countries. Significant investment in transforming agrifood systems is needed also for climate change adaptation. However, international investment in agriculture and the agriculture value chain (including, among others, basic agricultural production; food processing; the production of seeds, fertilizers and pesticides; and related technology and R&D activities) has been stagnant since the adoption of the SDGs.

In 2022, announced greenfield investment projects increased by almost 70 per cent in value, but only marginally in numbers. The top destination for greenfield investment was Mexico, with 27 projects, followed by Türkiye and the United Arab Emirates, with 24 projects each. International project finance deals doubled in number, but project sizes were much smaller as the total value halved. In LDCs, investment in the agrifood systems sector increased (table I.15). The LDC share in the number of greenfield projects in developing countries almost doubled; however, LDCs attracted only 3 of the 20 – on average much larger – international project finance deals in developing countries.

(i) Basic agricultural production

Developing countries remain key destinations for investment in basic agricultural production, which encompasses crop production, processed crops, live animal production and primary animal products (FAOSTAT, 2023). Investment in agricultural production showed an increase in 2022. Most of the announced investment projects were in fruit and vegetable production, followed by animal production and then grains and oilseed production. EW Group (Germany) led greenfield investment in animal production through four projects in poultry breeding in Argentina, Brazil, Peru and Türkiye.

(ii) Food processing

The bulk of cross-border investment activity in agrifood industries is in food processing. In 2022, the value of projects in this category accounted for about 60 per cent of investment in both greenfield projects and international project finance deals. International project finance activity recorded significant growth (tables I.15 and I.16). Mexico, the United Arab Emirates and China were the top destinations for investments in food processing.

Table I.15. Agrifood systems: announced greenfield projects in developing economies, 2019–2022
(Millions of dollars and per cent)

	Developing economies					LDCs				
	2019	2020	2021	2022	Growth rate, 2021–2022 (%)	2019	2020	2021	2022	Growth rate, 2021–2022 (%)
Total										
Value	**23 406**	**11 287**	**11 750**	**19 837**	**69**	**4 925**	**479**	**426**	**704**	**65**
Number of projects	**448**	**293**	**274**	**280**	**2**	**32**	**12**	**7**	**13**	**86**
Technology										
Value	158	8	98	10	- 90	5	-	-	-	..
Number of projects	13	3	7	5	- 29	1	-	-	-	..
R&D										
Value	155	129	205	99	- 52	-	-	12	-	..
Number of projects	14	13	17	9	- 47	-	-	1	-	..
Food processing										
Value	15 901	9 679	10 685	13 209	24	1 522	250	289	426	47
Number of projects	359	241	227	236	4	25	10	2	12	500
Basic agricultural production										
Value	1 355	1 307	432	526	22	99	229	83	-	..
Number of projects	28	27	11	13	18	3	2	2	-	..
Fetilizers, pesticides and other chemicals										
Value	5 837	164	329	5 994	1 722	3 300	-	42	279	564
Number of projects	34	9	12	17	42	3	-	2	1	- 50

Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com).

Table I.16. Agrifood systems: international project finance deals in developing economies, 2019–2022 (Millions of dollars and per cent)

	Developing economies					LDCs				
	2019	2020	2021	2022	Growth rate, 2021–2022 (%)	2019	2020	2021	2022	Growth rate, 2021–2022 (%)
Total										
Value	**741**	**1 851**	**8 137**	**4 424**	**-46**	**173**	**-**	**-**	**1 932**	**..**
Number of projects	**5**	**4**	**10**	**20**	**100**	**1**	**-**	**-**	**3**	**..**
Food processing										
Value	567	1 351	167	2 513	1 405	-	-	-	166	..
Number of projects	4	3	3	17	467	-	-	-	1	..
Basic agricultural production										
Value	-	-	85	1 600	1 782	-	-	-	1 600	..
Number of projects	-	-	2	1	-50	-	-	-	1	..
Fetilizers, pesticides and other chemicals										
Value	173	500	7 885	310	-96	173	-	-	167	..
Number of projects	1	1	5	2	-60	1	-	-	1	..

Source: UNCTAD, based on information from Refinitiv SA.

(iii) Fertilizers, pesticides and other agricultural chemicals

Worldwide, the use of inorganic fertilizers increased by almost 50 per cent over the last two decades, while the use of pesticides increased by 30 per cent (FAO, 2022). The growing demand for fertilizers and pesticides in agricultural production has led to increasing interest on the part of international investors in this category. In 2022, Brazil was the top destination for such projects, accounting for a quarter of them, followed by the United Arab Emirates and Chile.

(iv) Technology and R&D

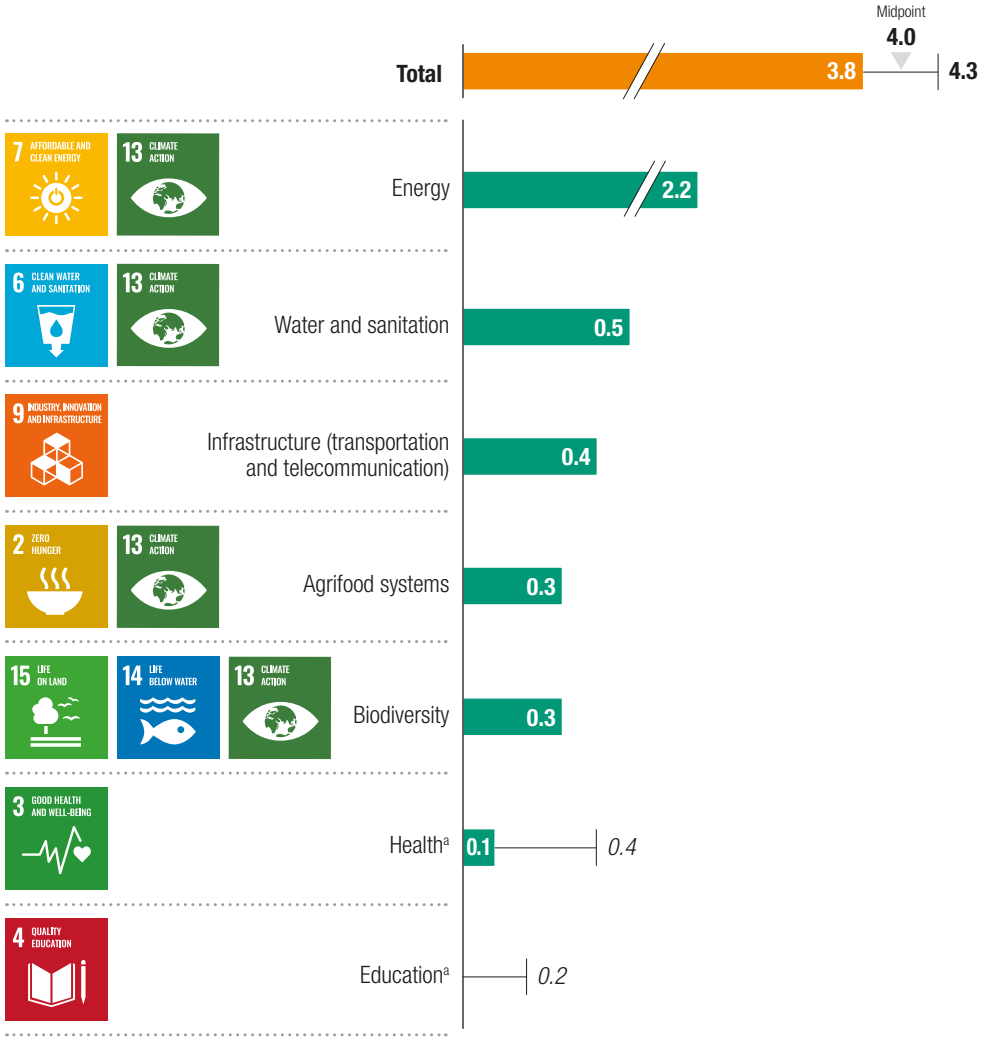
Investment in technology for the agrifood systems sector is an important component of agricultural modernization, as it enables food producers to automate, monitor and analyse processes. Project numbers and values in agricultural technology saw a decline in 2022, with just a few projects in sales, marketing and support activities.

R&D in the agrifood industry is key for productivity and yield growth. In the face of rising challenges from climate change, new crop diseases and increasingly scarce natural resources, R&D in agriculture is even more vital. International investment activity in this area remains marginal across developing countries. Both project numbers and values saw a decline in 2022 compared with 2021. Brazil was the top destination for R&D investment.

2. Investment needs at the midpoint of the 2030 agenda

WIR14 presented the first comprehensive assessment of investment needs associated with the SDGs. That report showed a $2.5 trillion annual investment gap in developing countries. Today, at the midpoint of the 2030 Agenda for Sustainable Development, that figure has risen to $4 trillion per year (figure I.14). The increase in the gap is the result of shortfalls in the years since 2014, combined with the effects of multiple global challenges, including the pandemic and the triple food, fuel and finance crises (box I.1).

Figure I.14. **Key SDG sectors: estimated annual investment gap in developing countries, capital expenditure, 2023–2030** (Trillions of dollars)



Source: UNCTAD (forthcoming).
Note: Investment refers to capital expenditure.
[a] The range for the health and education sectors reflects uncertainty about the size of the capital expenditure component in the total investment gap for the two sectors, for which the operational expenditure component is expected to be substantial.

On an annual basis, the current investment gap is 60 to 70 per cent higher than the (already significant) gap estimated in 2014. If the SDGs are to be achieved by 2030, more than $30 trillion of new investment is necessary over the next eight years.

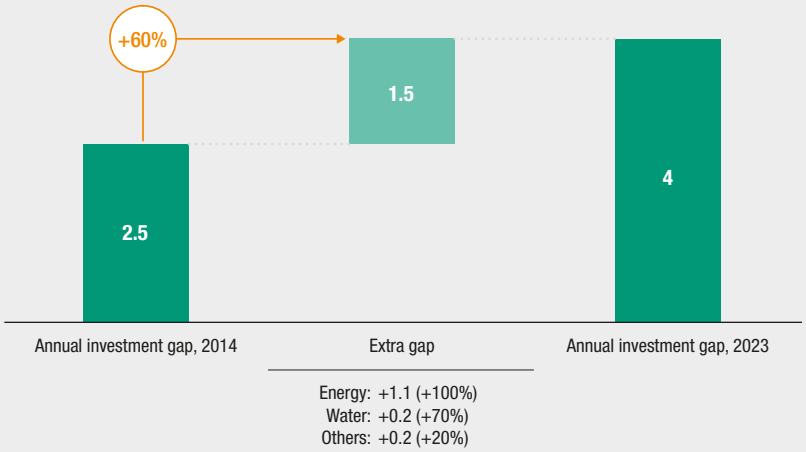
The estimate refers, primarily, to capital expenditure in (mostly) infrastructure projects. It is obtained as the sum of the investment gap derived for each SDG sector individually, which is assessed on the basis of the most recent studies published by specialized agencies, institutions and research entities in their respective areas of competence, using a meta-analytical approach.[2]

The increased investment requirements are huge, strengthening the case already made in *WIR14* for a step-change in public and private investment in the SDGs. Mobilizing sufficient funds for the SDGs was already a daunting task in 2014. Now it is even more challenging and pressing. Although SDG investment – as tracked by the UNCTAD *World Investment Report* and *SDG Investment Trend Monitor* – is growing, and in some critical areas such as renewables it is growing significantly, it is still not moving fast enough.

Box I.1. SDG financing at the midpoint of the 2030 Agenda: a comparison with the *WIR14* SDG investment gap

As of 2023 the annual SDG investment gap has increased by about 60 per cent compared with the $2.5 trillion estimated on the eve of the adoption of the SDGs (box figure I.1.1). The increase has occurred mostly in the two SDG sectors with the largest gaps – energy, and water and sanitation – where the gaps have grown by 100 and 70 per cent, respectively. Together these two sectors account for more than 85 per cent of the $1.5 trillion increase in the SDG investment gap. For the other SDG sectors, the aggregate funding gap has increased more moderately.

Box figure I.1.1. Key SDG sectors: change in annual investment gap in developing countries, 2014 and 2023 (Trillions of dollars)



Source: UNCTAD (forthcoming).

The additional gap weighing on SDG financing is the result of two critical trends that have taken place over the last 10 years.

- *Underinvestment:* Given the investment needed to achieve the SDGs, the pace of growth of SDG investment has been below the 2014 ambitions, with the COVID-19 pandemic playing a major role in slowing down progress in SDG financing (section B.1; UNCTAD, 2021; *WIR*, various editions).
- *Additional needs:* The context for SDG investment has deteriorated, particularly as a result of the exogenous shocks of the pandemic, the war in Ukraine and the triple food, fuel and finance crises. In addition, estimates by specialized agencies of investment needs for climate change mitigation and adaptation have increased (UN DESA, 2022).

The relative contributions of underinvestment and additional needs in the "extra gap" accumulated since 2014 are difficult to assess on the basis of available data. A simulation exercise by UNCTAD for the two most relevant SDG sectors for financing – energy, and water and sanitation – suggests that both components are relevant, with underinvestment accounting for about two thirds of the increase.

Source: UNCTAD.

While all SDG sectors are crucial for sustainable development, the energy sector carries the most weight in terms of investment needs. At $2.2 trillion, energy needs make up more than half of the investment gap. This gap refers entirely to investment in renewable energy generation, energy efficiency and other transition-related technologies and sources, covering not only SDG 7 (affordable and clean energy) but also SDG 13 (climate action). The latter is also financed by investment in other SDG sectors, including water and sanitation, biodiversity and agrifood systems.

With an estimated investment gap of half a trillion dollars per year, the second most capital-intensive SDG area is water and sanitation, which directly addresses SDG 6. It includes investment in water sources (for example, new water treatment plants and desalination plants), sanitation facilities and wastewater management. Combined, energy and water and sanitation represent almost 70 per cent of the total investment gap in the run-up to 2030.

Investment in economic infrastructure other than energy mainly addresses SDG 9 (industry, innovation and infrastructure), including the targets to "develop sustainable, resilient and inclusive infrastructure" (9.1) and to secure "universal access to information and communication technology" (9.8). For this, the bulk of the finance needed is in transportation and telecommunication infrastructure, for which the combined investment gap amounts to $400 billion annually (about equally split between the two).

Eliminating extreme poverty and hunger (SDG1 and SDG 2) will require an additional $300 billion per year in agrifood systems. Investment in agrifood systems is also instrumental for SDG 13, on climate action.

The investment gap in biodiversity is also estimated at $300 billion, mainly for SDG 14 (life below water) and SDG 15 (life on land), but also SDG 13 (climate action). Biodiversity encompasses a wide and heterogeneous range of investment in areas associated with environmental sustainability, including nature conservation, sustainable fishing practices, ocean pollution control and sustainable forestry.

Finally, investment in health and education is a prerequisite for sustainable development and a key enabler for the achievement of all SDGs. However, most of the financing needs in these areas are absorbed by operational costs (related to running hospitals and schools, for example), while the capital component is expected to be less relevant than for the other SDG sectors. Given this, a wide range has been estimated to reflect the uncertainty about capital requirements, resulting in a combined investment gap of $100 billion to $600 billion for health and education.

C. ENERGY TRANSITION INVESTMENT

The energy transition requires capital expenditures not only in renewable energy generation and electrification, but also in sustainable infrastructure, in energy-efficient buildings and in decarbonizing industry. Furthermore, energy transition investment requirements extend across the renewables supply chain, to include R&D; critical minerals; component manufacturing and production; and installation and operation of solar panels, wind turbines, batteries and other key technologies. This is an indication of the scope and scale of the potential investment areas.

All types of funds – private, public, domestic, international – are needed to achieve the levels of investment required. Traditionally, domestic operations have been prevalent in power generation, especially transmission and distribution. Public investment has also been important in these areas and remains so in sustainable infrastructure and low-emissions transport, among others. The role of international private investment varies depending on the sector but is significant in several dimensions. For example, capital expenditure towards energy-efficient buildings or industry decarbonization affect the investment plans of both domestic and international investors and tend to lead to investment in brownfield or modification projects rather than new greenfield projects. However, in the main energy transition sectors – such as renewable energy generation, electric vehicles and the phasing-out of fossil fuel industries – MNEs and international investors play a key role. Therefore, these sectors are the principal focus of this section.

1. Renewables and energy infrastructure

a. Energy production

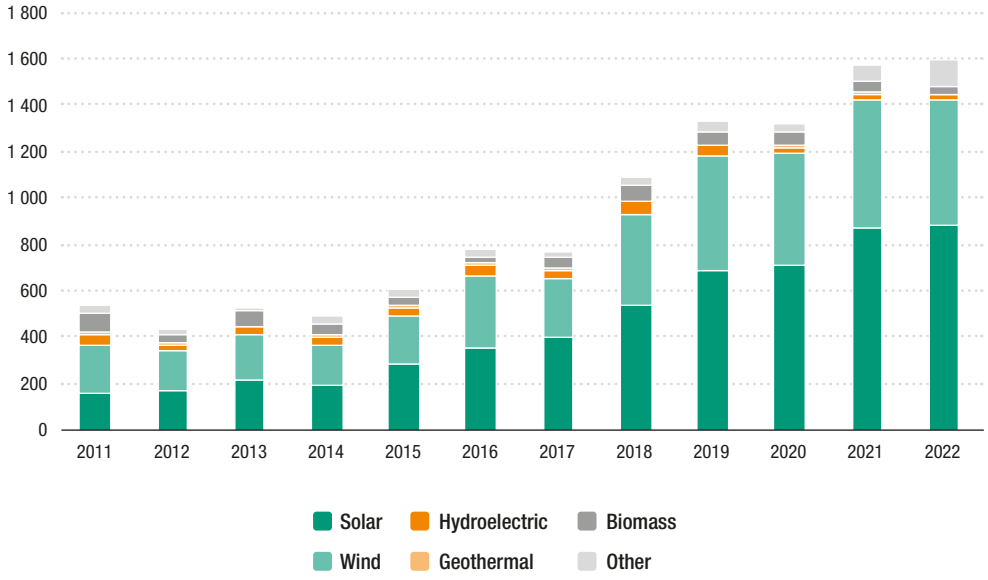
Several developments have driven up announcements of international investment in renewables over the past decade. Investment accelerated after the adoption of the SDGs and the Paris Accord in 2015, and again in 2021 when stimulus packages focused on green infrastructure.

In 2022, the number of international projects in renewable energy increased marginally following a leap in 2021 (figure I.15). Investment in solar and wind continued to dominate, with 89 per cent of total projects. Wind projects are typically larger than solar projects because the technology is costlier. Exceptions exist, however, such as the Maharashtra Ultra Mega Renewable Energy Solar Park project in India, a $226 million construction. Other sources of renewable energy, although much smaller, also attract growing amounts of investment; tidal and wave projects and waste-to-energy projects are increasing in number.

Over the past decade, more than half of all international investment projects in renewables were solar energy projects, except in Europe, which is the leading region for investment in wind power. Two thirds of all renewable energy projects in Africa were in solar energy, as it is the continent's cheapest and best fitting source. In North America, developing Asia and Oceania, the share of solar was above 60 per cent.

New announcements of renewables investments in 2022 included several megaprojects, such as India's 2 GW Ayana Karnataka wind and solar hybrid project, for an estimated cost of over $1.5 billion, and the Masdar Tanzania renewable energy project, which will create a 2 GW solar power plant.

Figure I.15. **International investment projects in renewables, by type, 2011–2022**
(Number of projects)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com) and Refinitiv SA.
Note: Green hydrogen is not included in "Other" renewables as in *WIR22*, so as to be consistent with the IRENA and IEA classification. Hydrogen is often produced as a feedstock for industry. The data set captures internationally promoted projects of utility-sized installations.

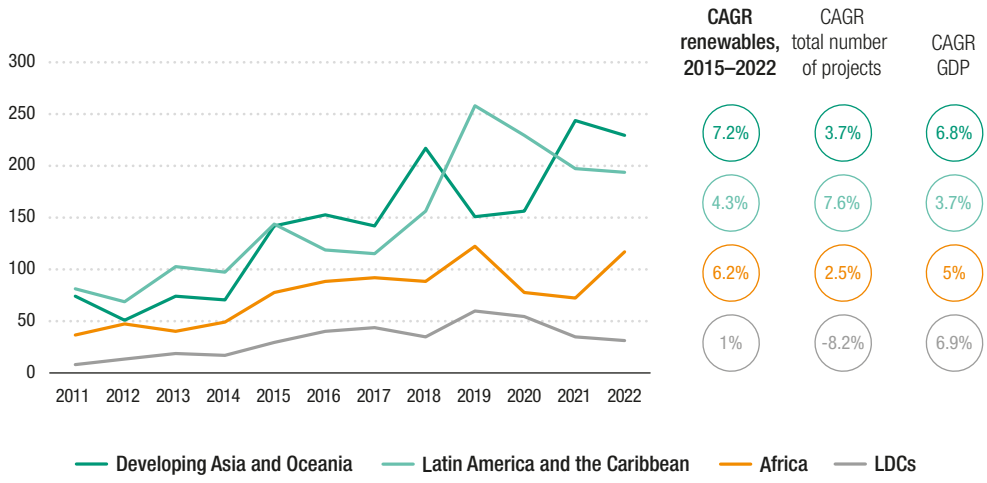
Countries in Europe and Latin America and the Caribbean have the highest shares of wind in international renewable energy projects (at 46 and 35 per cent, respectively). Offshore and floating wind power plants are becoming particularly important in Europe. The most ambitious of these projects is the Sea Sapphire Baltic Four floating offshore wind project, which involves the construction of four commercial-scale installations generating up to 40 terrawatt-hours per year to meet energy needs in Sweden and Finland. Others include the Ireland offshore wind development project, which will create a 2.2 GW plant at an estimated cost of $4.3 billion.

The rapid growth in international investment activity in the renewable energy sector has been mostly confined to developed countries, particularly in Europe, where policy and investment trends have merged. In developing regions, the growth of international project finance and greenfield projects has been much more gradual. It has outpaced GDP growth, but only marginally. In LDCs, where the need for investment in energy is especially high, renewables investment from international sources has lagged GDP growth. Since 2015, LDCs have seen the number of renewables projects increase by only 1 per cent per year, while their economies grew almost seven times faster (figure I.16).

Since 2015, developing Asia has had the highest growth in incoming projects, followed by Africa. The growth of project numbers in Latin America and the Caribbean has stagnated since 2019, due in part to Mexico's pivot towards domestic fossil fuel energy, motivated by concerns about energy security. Average growth in international investment in renewables has been above the rate of growth of total FDI projects in most regions except Latin America and the Caribbean.

It should be noted that for some regions, looking only at international project numbers underestimates total investment in renewables. Several large emerging economies are major investors in renewable technologies themselves, with limited need for foreign investment in their energy supply.

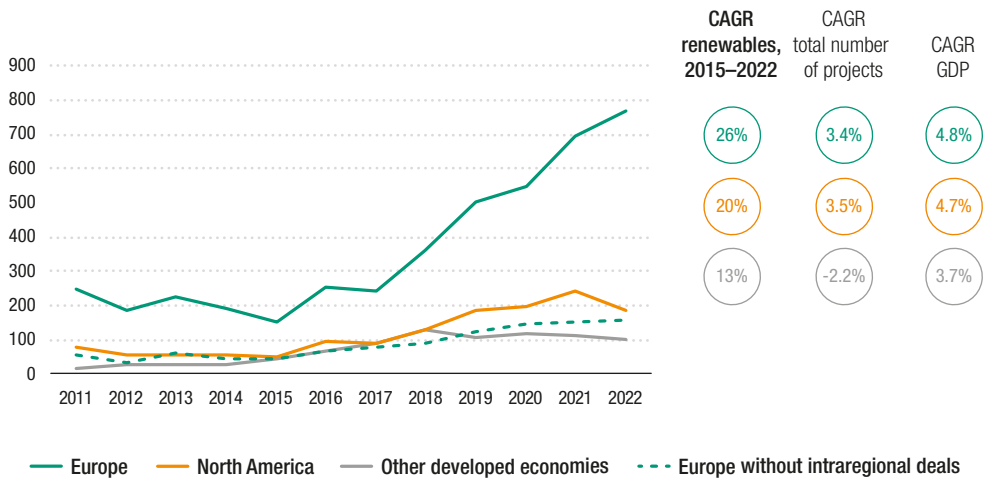
Figure I.16. **Renewable energy: international investment in developing regions, 2011–2022** (Number of projects)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com) and Refinitiv SA for projects and IMF (2022) for GDP.
Note: Growth rate is calculated as the compound annual growth rate (CAGR) for the period 2015–2022. GDP growth is in terms of purchasing power parity. The data set captures internationally promoted projects of utility-size installations.

The situation in developed countries is markedly different. The number of international investment project announcements in renewable energy in developed countries was almost twice that in developing countries in 2022, and growth rates are significantly higher (figure I.17). Including intra-European investments, Europe alone accounted for almost three quarters of all international investment projects in renewable energy in 2022, reflecting energy security concerns and concerted efforts to reduce the region's reliance on gas supplies from the Russian Federation. Excluding intraregional deals, the trend in international investment in the region is comparable to that in the other developed regions.

Figure I.17. **Renewable energy: international investment in developed regions, 2011–2022** (Number of projects)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com) and Refinitiv SA for projects, and IMF (2022) for GDP.
Note: Growth rate is calculated as the compound annual growth rate (CAGR) for the period 2015–2022. GDP growth is in terms of purchasing power parity. The data set captures internationally promoted projects of utility-size installations.

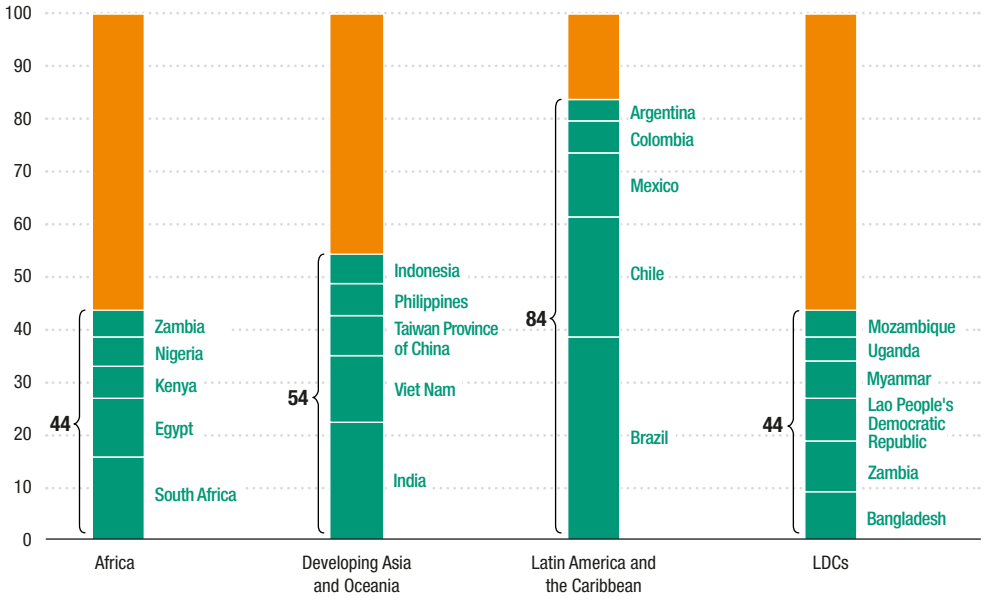
In addition to the relatively slow growth of international investment in renewable energy in developing regions, international project finance and cross-border greenfield projects also appear to show relatively high levels of concentration in a few countries (figure I.18). Larger and more advanced economies attract most of the projects. In Latin America and the Caribbean, three countries – Brazil, Chile and Mexico – attracted three quarters of all renewable energy projects announced in the region in 2022.

In developing Asia, the ranking of host economies does not reflect the importance of China in overall investment in renewable energy. It is the world's top investor in renewables (IRENA and CPI, 2023) through its domestic firms. The top host economies for international renewable energy projects in the region are India, Viet Nam and Taiwan Province of China, which attract more than 40 per cent of the projects.

In Africa, the economies of South Africa, Egypt, Kenya, Nigeria and Zambia account for about 40 per cent of projects on the continent. Among the LDCs, five countries attracted almost 40 per cent of investments in 2022, while as many as 11 countries did not register a single international project in renewable energy between 2015 and 2022.

The ranking of the top 10 non-financial MNEs by the number of international greenfield projects and project finance deals in renewable power promoted during the period from 2015 to 2022 sees Enel (Italy) top the list, followed by other top European utility MNEs, the solar energy company Canadian Solar (Canada) and the fossil fuel company TotalEnergies (France) (table I.17). Other European energy MNEs such as BP (in 12th position) and Shell (16th) are also in the top 20 as they work to switch to renewable sources. European utilities are increasingly specialized in providing renewable energy, with most having set ambitious targets for their energy mix in transition. Several United States energy firms are also actively developing renewables projects, but mostly in their home market. Top domestic investors in renewable energy include NextEra Energy with 59 projects, followed at a distance by AES and Duke Energy with 45 and 44 projects.

Figure I.18. **Renewable energy: top five host economies by region, 2015–2022**
(Per cent)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com) and Refinitiv SA.
Note: In LDCs, the top five host economies for international renewable projects include six countries as Mozambique and Uganda received the same number of projects.

Table I.17. Top investors in renewable power by number of projects between 2015 and 2022

Company	Country	Industry	Number of projects, 2015–2022
Global			
Enel	Italy	Multilines utilities	361
Engie	France	Multilines utilities	195
Electricité de France	France	Multilines utilities	180
Iberdrola	Spain	Multilines utilities	161
Energías de Portugal	Portugal	Multilines utilities	142
Canadian Solar	Canada	Renewable energy	126
RWE	Germany	Multilines utilities	123
TotalEnergies	France	Oil and gas	119
Orsted (Dong Energy)	Denmark	Renewable energy	100
Impala	France	Diversified	95
Developing economies			
ACWA Power	Saudi Arabia	Renewable energy	53
Abdul Latif Jameel	Saudi Arabia	Diversified	50
Masdar Clean Energy	United Arab Emirates	Renewable energy	48
Vena Energy	Singapore	Infrastructure	44
China General Nuclear Power Corp	China	Energy	39
Ayala Group	Philippines	Diversified	31
Power Construction Corporation of China	China	Energy	26
AMEA Power	United Arab Emirates	Renewable energy	23
ReneSola	China	Renewable energy	19
Sembcorp Industries	Singapore	Infrastructure	19

Source: UNCTAD, based on information from The Financial Times, fDi markets (www.fdimarkets.com) and Refinitiv SA.

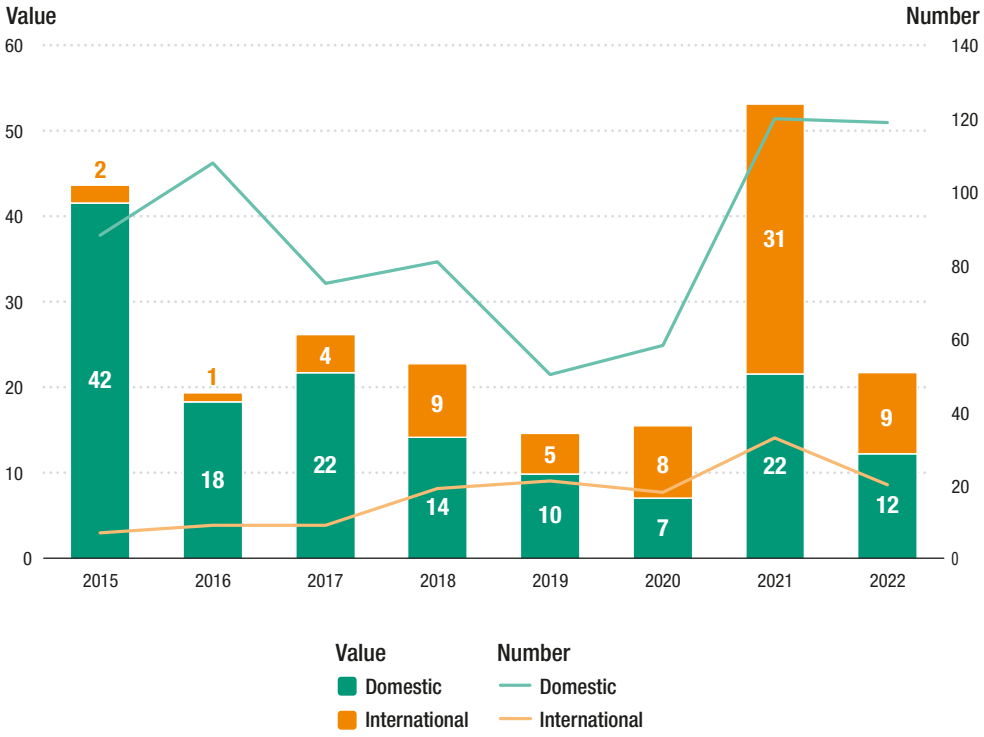
Among MNEs in emerging markets and developing economies, Western Asian companies top the ranking. In addition to companies specialized in renewable energy, there are a few diversified groups, such as Abdul Latif Jameel and the Ayala Group, which have started to promote projects in this area only relatively recently.

b. Power grids and transmission lines

Numbers of investment projects in aspects of renewable energy other than power generation are significantly lower. International investment in power grids and storage capacity accelerated only after 2020, even though such investment is a critical complement to renewable energy generation. To date, most investment in this sector in developing countries remains domestic. However, the recent acceleration in international projects in energy infrastructure suggests that there is potential for FDI to play a bigger role.

Investment announcements in transmission lines in developing countries increased in 2021 but slowed again in 2022. Most transmission line construction projects were in large emerging economies, including India, Egypt, Brazil, the United Arab Emirates and Kuwait (in that order). In LDCs, more than half of the projects under way fall within the framework of the Chinese Belt and Road Initiative. Most of these projects have as their main sponsor a ministry, government agency or state-owned national utility.[3]

Figure I.19. **Transmission lines: announced project finance deals in developing countries, 2015–2022** (Billions of dollars and number)



Source: UNCTAD, based on information from Refinitiv SA.
Note: Includes only projects that are setting up independent transmission lines (not included in renewable energy plant installations).

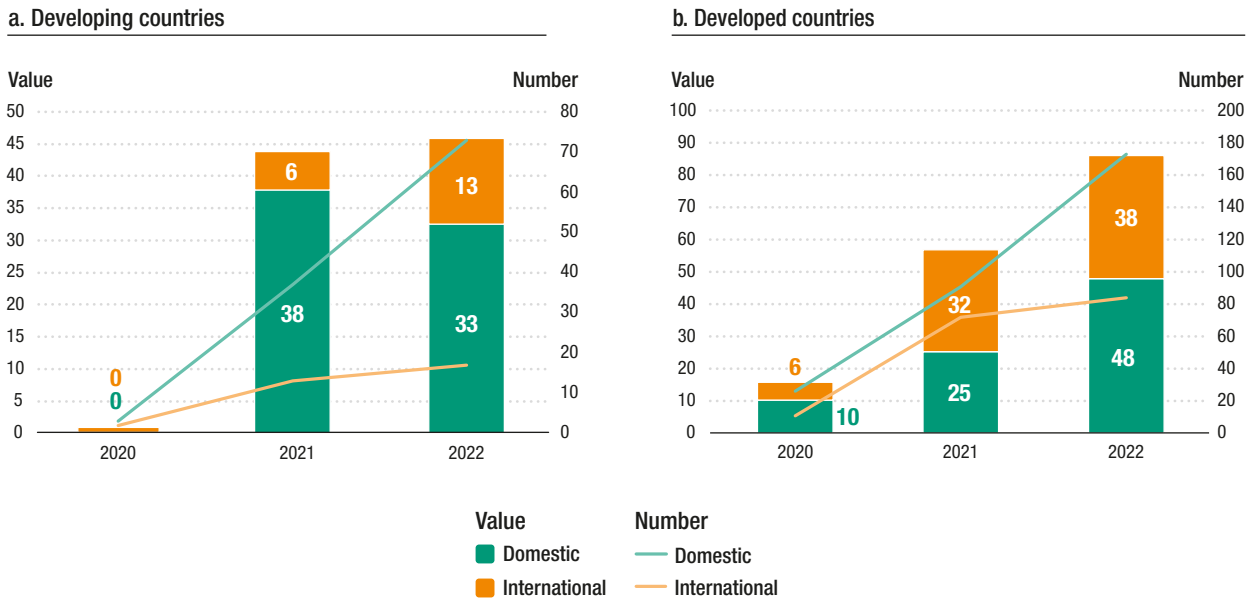
International investment in transmission lines tends to be significantly larger than domestic projects (figure 1.19). These projects can include not only the construction of a power plant, but also of transmission lines to overseas markets to allow trade in electricity. For example, the Elica Interconnection undersea power cable project involves the construction of a 963-kilometre double submarine cable between El Sallum in Egypt and Nea Makri in the Attica region of Greece. The cable will transfer 3 GW of wind and solar energy, of which 1 GW will be supplied to domestic industry, 1 GW for the Greece–Italy and Greece–Bulgaria networks, and 1 GW for the production of hydrogen, which will be exported to Europe.

Several Latin American countries, such as Chile, Colombia and Brazil, have engaged international sponsors, including Albengoa (Spain), Enel (Italy) and Engie (France), in investment projects to expand their national grids. Brazil introduced the Cobra Minas Gerais public-private partnership project, which involved the design, construction and operation of six 500-kilovolt transmission lines, several smaller sections of lines, a new substation and eight substation extensions.

In developed economies, the number of transmission line projects also increased significantly, particularly for the modernization of infrastructure, the connection of offshore wind farms to the grid and grid digitalization. But, according to the IEA (2022b), the current high prices of raw materials (particularly copper and aluminium) could reverse this upward trend.

Energy storage projects are also increasing in number. These projects are critical for the energy transition because variable weather patterns limit the capacity of renewable energy technologies to deliver consistent power. Energy storage systems can push surplus energy into the grid when needed. Battery storage is a relatively new area for international

Figure I.20. **Storage technologies: announced project finance deals in developing and developed countries, 2020–2022** (Billions of dollars and number)



Source: UNCTAD, based on information from Refinitiv SA.
Note: Includes deals not related to production of electric vehicles and only projects that are setting up independent storage systems (not included in renewable energy plant installations).

investment, with the first projects announced only in the last few years and concentrated in developed economies (figure I.20). Battery storage projects in the United States, the United Kingdom and Australia account for more than two thirds of total investment globally. Among emerging economies, India and China are the top investors, albeit almost exclusively through domestic projects. South Africa has attracted several battery storage projects, with capacities ranging from 35 MW to 300 MW.

c. Other low-emission energy sources

Investment in other low-emission energy sources are as important in the energy mix as renewable technologies, power grids and storage capacity. However, the number of cross-border investment projects in nuclear energy and green hydrogen, among other sources, is low.

The development of nuclear energy plants suffered significant setbacks in the last decade. The size of nuclear investment projects, as well as their technical complexity, long-term footprint and controversy make nuclear less popular as an investment decision. Because of the high risk involved, nuclear power plants are typically projects that are promoted by national State-owned utilities. The exception was in 2022 when European economies started attempts to attract foreign investors to develop smaller-scale nuclear plants.

Investment in hydrogen as a feedstock for heavy industry and for power generation is experiencing growing momentum. In power generation, hydrogen is one of the leading options for storing renewable energy. Hydrogen and ammonia can also be used in gas turbines to improve power system flexibility (IEA, 2022b) and in coal-fired power plants to reduce emissions. Hydrogen will be needed to decarbonize end-uses where other options are less mature or more costly, such as for heavy industry (chemicals, steel and refineries), long-haul transport and seasonal energy storage (IRENA, 2022e).

International investment projects in hydrogen started to register only very recently, with the first projects announced in 2018. The number of projects accelerated in 2021 and 2022, with most of them in developed countries. In developing markets, the number of international projects is still limited. Egypt announced several large-scale projects when it hosted COP27 in 2022. Other developing countries that have attracted hydrogen projects include Chile, India and countries in the Gulf Region.

In Africa, Niger joined Namibia, Egypt, Morocco, Mauritania and South Africa as a hydrogen-producing country following the establishment of the Emerging Energy–Government of Niger Green Hydrogen Portfolio project. Three quarters of the projects in these countries produce hydrogen by electrolysis using renewable energy (green hydrogen). Top investors are mostly from Europe (including Linde (United Kingdom), Enel (Italy) and Air Liquide (France)) and from the United States.

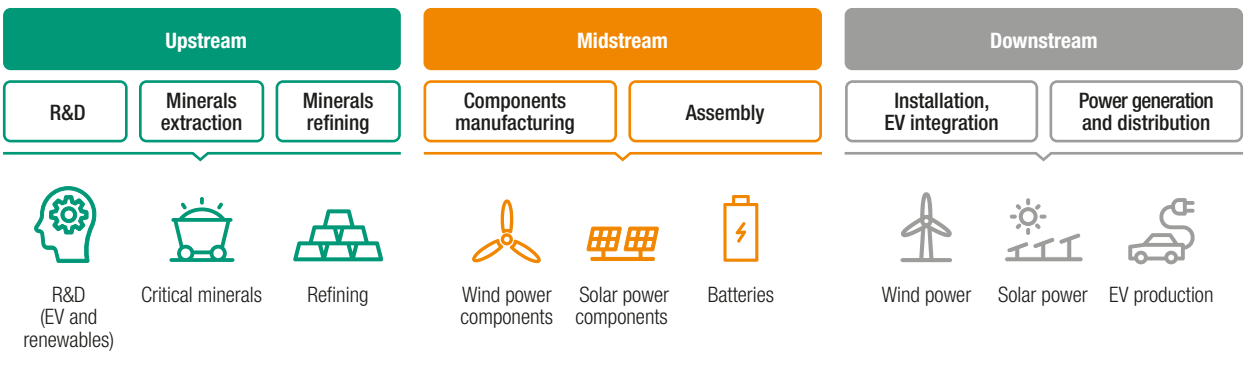
2. The renewable energy value chain

The global and regional supply chains underpinning the deployment of clean energy generation technologies (particularly wind and solar energy installations; figure I.21) are still being shaped through international investment in various upstream activities (R&D, critical minerals, processing industries and component manufacturing). Clean energy strategies are increasingly shaping industrial policies. New actors are emerging among developing countries – other than the traditional manufacturing centres – aiming to establish themselves as production hubs for clean energy technology. Still, the upstream and midstream parts of the renewable energy value chain – as in the case of many young industries – remain concentrated for now.

More than 80 per cent of investment across all segments of the renewable energy value chain is private investment. Today, China and a few other economies (all developed ones) are the leading producers of and investors in renewable energy technologies. However, opportunities to attract investment exist for developing countries as supply chains gradually become more diversified.

The energy transition has increased demand for numerous metals and minerals. Copper, nickel, cobalt, aluminium, chromium, lithium, manganese and molybdenum are required for a range of low-carbon technologies, particularly wind turbines, solar photovoltaic panels and electric vehicle batteries. Permanent magnets for wind turbines and for electric vehicles require rare earth metals such as neodymium and dysprosium, while battery storage

Figure I.21. Elements of the renewable energy value chain



Source: UNCTAD.

and batteries for electric vehicles typically use lithium, nickel and cobalt. Solar energy technologies, as well as the transmission lines and distribution cables that make up the electricity grids, use large amounts of copper.

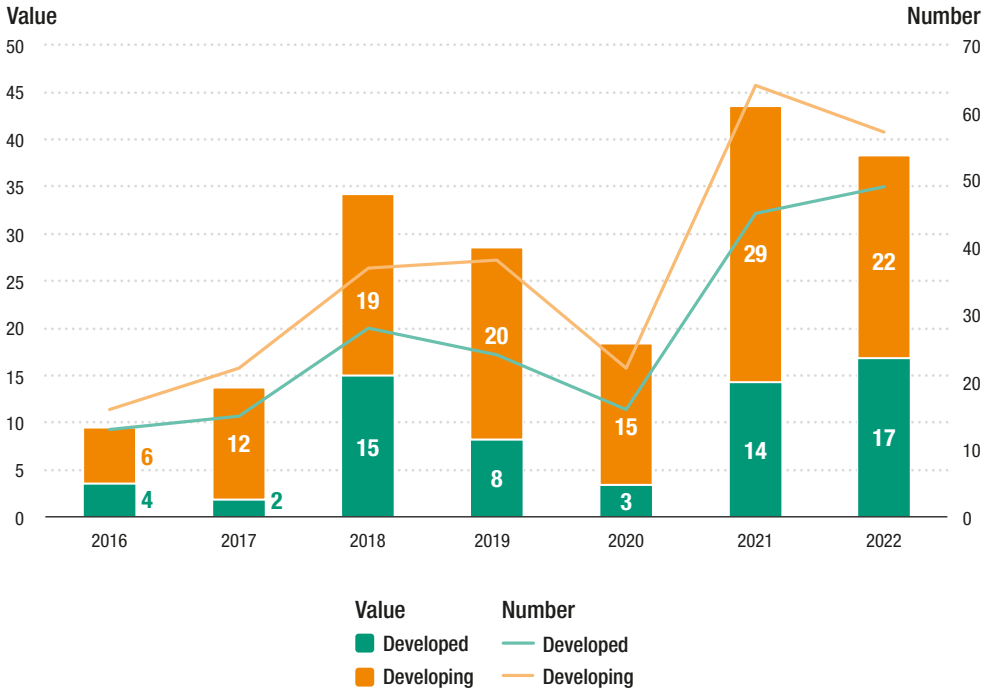
These critical minerals are traditionally mined in developing countries, including the Democratic Republic of Congo for cobalt, Indonesia for nickel and several Latin American countries for copper. Australia is among the top locations for almost all critical minerals. For lithium and rare earth metals, the race to establish new extraction sites is relatively recent. The United States and Latin American countries have been developing new projects to mine lithium.

The pace of announced investments in critical minerals has doubled in the last two years (figure I.22), and more growth is expected. Deployment of clean energy technologies will further push up demand for critical materials. Demand for copper in 2050 is projected to be twice the supply in 2020, while demand for nickel is projected to triple. Lithium will see the highest growth in demand, with a projected 5- to 10-fold increase (IRENA, 2022e).

While the concentration of mining activities is determined by the geographical location of deposits, the processing and refining of these materials is currently highly concentrated among the top three refiners, which account for more than half of global processing capacity. China alone provides the processing of 88 per cent of rare earths, 65 per cent of cobalt, 58 per cent of lithium, 40 per cent of copper and 35 per cent of nickel (IRENA, 2022e).

Both the International Renewable Energy Agency (IRENA) and the International Energy Agency (IEA) highlight the importance of R&D for the energy transition; in many of their scenarios and projections, innovation in key technologies plays a critical role (IEA, 2022b; IRENA, 2022e). Much of the R&D in technologies required for the energy transition has

Figure I.22. **Critical minerals: international projects in developed and developing countries, 2016–2022** (Billions of dollars and number)



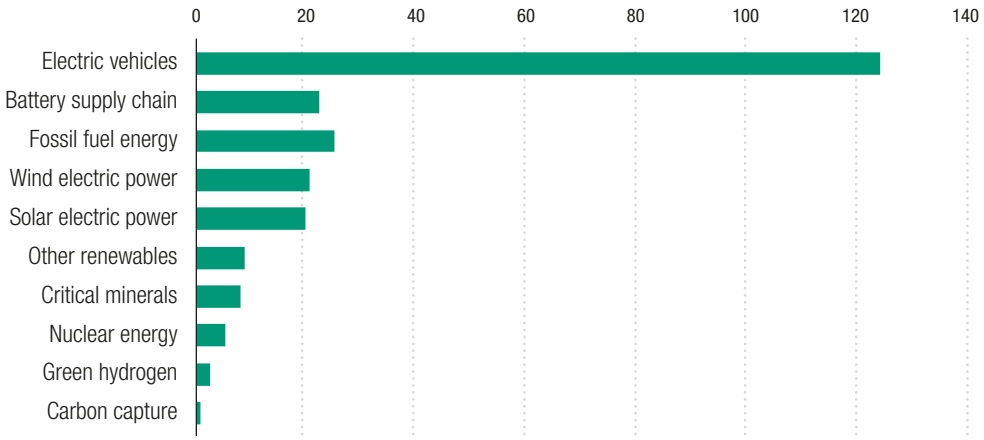
Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com) and Refinitiv SA.
Note: Includes projects for extraction and refining of critical minerals.

public support and most investment is domestic, although this is not true for R&D projects in electric vehicles and battery supply chains, where private investors are the major players (figure I.23). For international electric vehicle and battery R&D projects, China (18 per cent) is the top host location, followed by the United Kingdom, the United States, Germany and India. For projects in other renewable energy technologies, European countries attracted over 40 per cent of international projects, followed by China (10 per cent) and Singapore (8 per cent). The only international R&D project in carbon capture and storage is in Norway, where the oil field services company Schlumberger (United States) was selected to participate in the Northern Lights joint venture, which is deploying digital solutions in carbon sequestration.

International investment projects to produce or assemble components for renewable energy installations, such as solar cells and modules, polysilicon, ingots and wafers, and wind turbines, towers, blades and nacelles, have historically been located in developing economies, where producers have sought manufacturing efficiency. Since 2021, however, the number of projects announced in developed countries has been higher than the number in developing economies, especially for wind components (figure I.24). The number of projects increased by 13 per cent in 2022; values decreased because of a large project announced in 2021 by the solar energy firm Risen Energy (China). The project, worth more than $10 billion, involves a new production facility to manufacture high-efficiency photovoltaic modules in Malaysia. For international investment projects in solar energy component manufacturing, concentration has been relatively low. The top five destinations were the United States, Brazil, India, Viet Nam and China, which attracted 42 per cent of all projects. Other developing countries that attracted solar components projects include Malaysia, Türkiye, Mexico and South Africa. The list of top home economies is much shorter, with the major Chinese providers (Hangzhou Gene Solar Industries, JinkoSolar, Risen Energy, Longi Green Energy Technology) accounting for over a quarter of international projects. A notable investor among those based in developing countries is the Nigerian conglomerate Enpee Group, which is investing in solar panel component facilities in India.

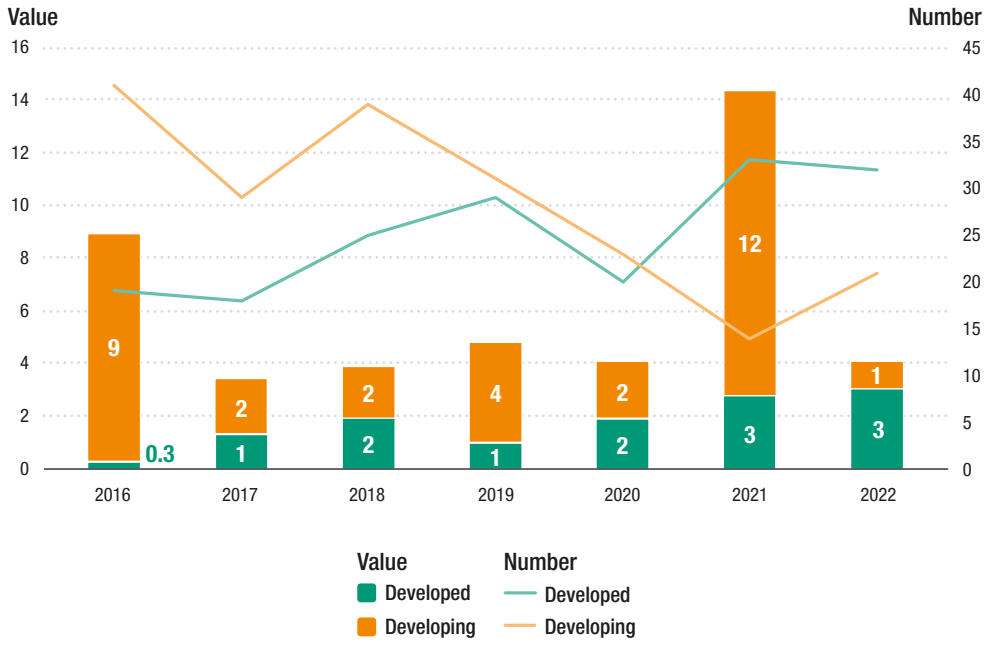
Top locations for the manufacturing of wind energy components include both developed and developing economies. The United Kingdom, United States, Türkiye, India and China accounted for almost half (46 per cent) of the total number of projects between 2016 and 2022. From a home-country perspective, investors from Europe and the United

Figure I.23. **R&D: announced greenfield projects, by energy transition industry, 2016–2022** (Number)



Source: UNCTAD. based on information from The Financial Times Ltd. fDi Markets (www.fdimarkets.com).

Figure I.24. **Wind and solar components: international projects, 2016–2022**
(Billions of dollars and numbers)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com) and Refinitiv SA.
Note: Includes only projects that develop, manufacture or assemble components and are not part of renewable energy plant installations.

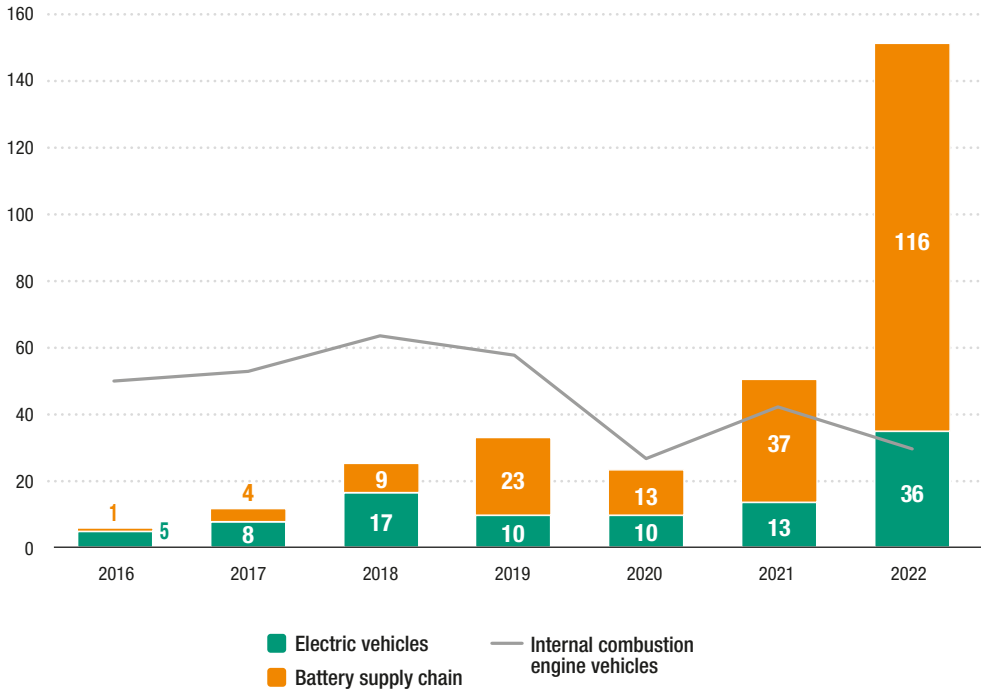
States accounted for more than half of all projects. The top MNEs are Vestas (Denmark), Siemens (Germany), GE (United States), Nordex (Germany) and CS Wind Corporation (Republic of Korea).

Electrified transport is one of the largest opportunities in energy transition investment (BNEF, 2023). International investment to set up electric vehicle manufacturing facilities has been growing since 2015, surpassing investment in internal combustion engine projects in 2022 (figure I.25).

Until 2020, the main investment destinations for producing electric vehicles were China, the United States and India. In value terms, China attracted almost 45 per cent of all such investment, followed at a distance by the United States and India, with shares of 10 and 7 per cent, respectively. In 2021 and 2022, the major destinations were developed economies and Mexico. European countries (including the United Kingdom) attracted 37 per cent, the United States 18 per cent and Mexico almost 17 per cent of the total investment in electric vehicle production. Other important destinations for electric vehicle production projects among developing countries since 2016 have been Thailand (six projects), Türkiye (six projects) and Brazil (five projects). The top five host economies – the United States, China, Mexico, India and Poland– attracted a little more than half (55 per cent) of all projects.

International investment in batteries has boomed in the last two years, reaching $116 billion in 2022, with many new battery producers setting up manufacturing facilities, mainly in developed countries and especially in the United States. The value of international investment projects announced in battery production in 2022 was almost twice that for electric vehicles and internal combustion engine car manufacturing combined, driven by international competition to develop this technology.

Figure I.25. **Electric vehicles, battery supply chain and internal combustion engine vehicles: announced international investment, 2016–2022**
(Billions of dollars)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com) and Refinitiv SA.
Note: Only projects that are setting up manufacturing facilities.

Between 2016 and 2020 half of the international investment in batteries went to Europe (Germany, 26 per cent; France, 11 per cent; Hungary, 10 per cent), followed by China (17 per cent), the United States (15 per cent) and Indonesia (10 per cent). Other top destinations for battery manufacturing among developing countries included Brazil, India, Malaysia and Mexico (in that order).

In 2021 and 2022, the United States attracted 40 per cent of all investment, Europe about 30 per cent and Indonesia 11 per cent. The largest project was announced by the Hon Hai Group (Taiwan Province of China): an $8 billion project in Indonesia to manufacture electric vehicles and batteries. The project was developed under the framework of a cooperation agreement between the Indonesian Ministry of Investment, the Indonesia Battery Corporation, the Indonesian coal miner Indika and the scooter producer Gogoro (Taiwan Province of China). The cooperation will also extend to the development of electric vehicle support industries such as energy storage systems, battery exchange stations and battery recycling. Indonesia is a major producer of nickel; the international cooperation framework is intended to leverage its supplies of nickel laterite ore (used in lithium batteries) to become a global production and export hub for electric vehicles.

The top investors in electric vehicles and batteries (combined) include all the major car producers, with Tesla (United States) topping the ranking, followed by BMW (Germany), Hyundai (Republic of Korea), Toyota (Japan) and Volkswagen (Germany). The top 10 investing MNEs account for about 50 per cent of international projects and include also top battery producers such as Chinese Contemporary Amperex Technology (China) and LG (Republic of Korea).

As electric vehicles become more common, investment in electricity charging infrastructure should increase. However, most of these projects are currently undertaken by domestic investors. The number of international projects recorded accounts for only one fifth of total projects. Moreover, very few projects to develop electric vehicle charging stations are recorded in developing economies.

3. Fossil fuel investment

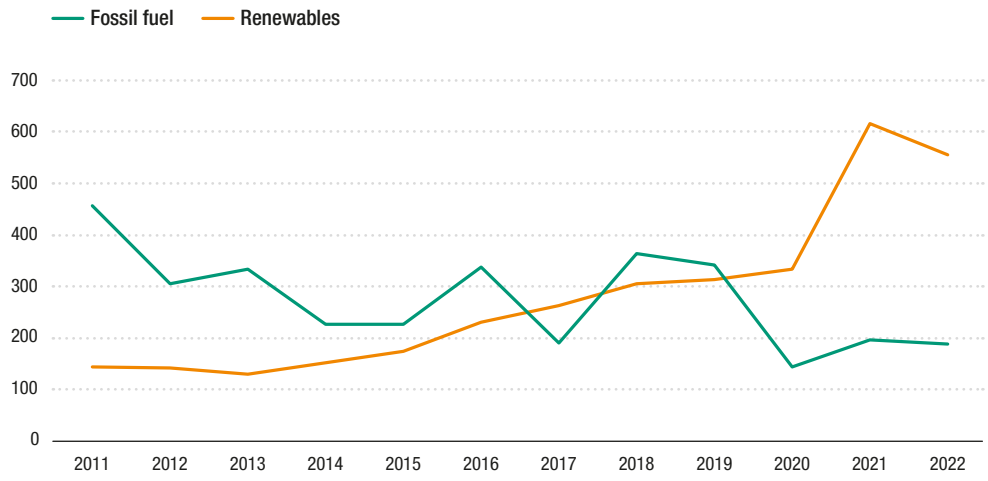
a. Investment trends

Despite the fear that high energy prices and the push for energy security would lead to a reversal in the downward trend of international investment in fossil fuel assets, the data for 2022 shows stable numbers overall for both fossil fuel-based power plants and extractive industries. (In extractives, greenfield investment by major oil and gas companies increased, but project finance deals declined.) The gradual shift from fossil fuel investment to renewable energy investment has continued since 2015, with the latter surpassing the former in 2020 (figure I.26).

Nonetheless, new fossil fuel-related investment is expected to continue for some time. It is necessary as a complement to renewable energy generation, it helps to deal with intermittency problems until new storage technologies are developed and, more generally, it is needed to meet energy demand while renewable capacity builds. During this transition time, fossil fuel power needs to invest in greater efficiency, carbon capture and storage, and technologies to allow the discontinuation of damaging practices such as flaring of waste gas.

In 2022, energy security concerns pushed countries to re-evaluate new fossil fuel-related investment projects aimed at securing supply chains. National strategic changes included the re-opening of coal plants and the building of infrastructure to import fossil fuels. For example, Germany approved 11 new liquefied natural gas ports to import fossil fuels until 2043. However, as requirements for the installation of carbon capture and storage become

Figure I.26. **Renewable and fossil fuel energy: international project finance deals and announced greenfield projects, 2011–2022** (Billions of dollars)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com) and Refinitiv SA.
Note: Fossil fuel projects include extractive and refining activities and power plant installations.

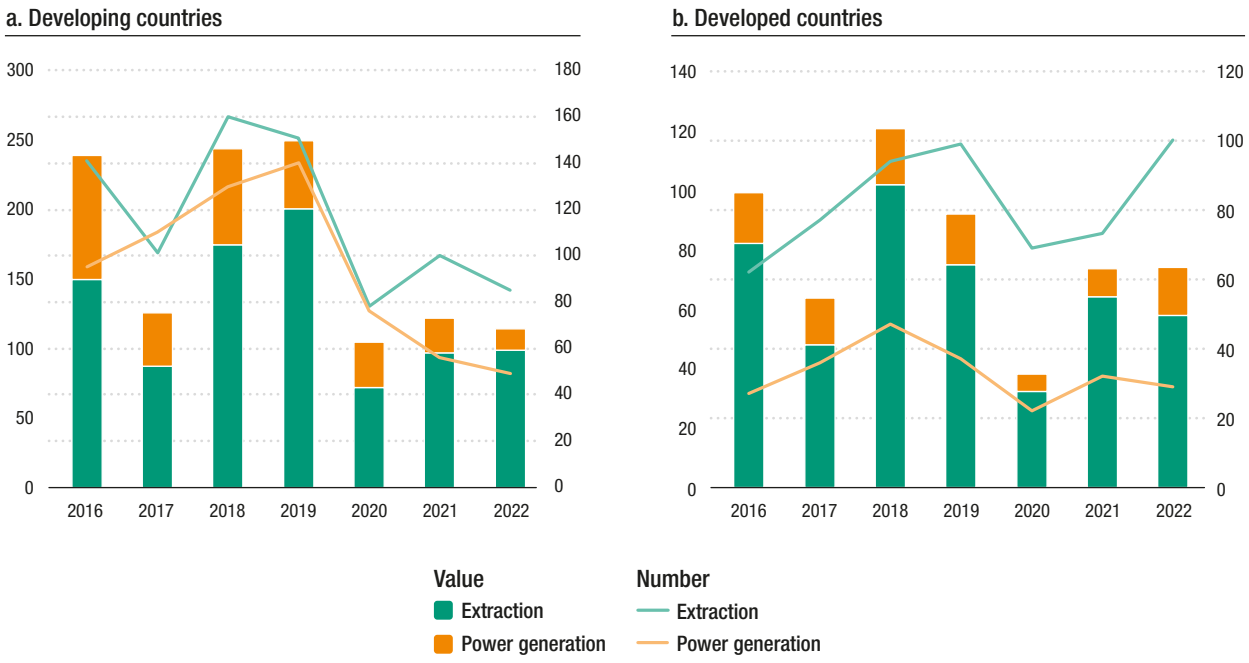
more stringent, rising investment costs should disincentivize the installation of new fossil fuel-based power plants. Moreover, financing may become difficult, with banks increasingly committed to climate goals (IEA, 2022b).

In developing countries, international investment in fossil fuel power generation has been declining since 2019 (figure I.27). Support from international financiers and development banks for new fossil fuel projects is waning or being withdrawn, and international investors are more attracted by renewable energy projects. As a result, development of new capacity in fossil fuel-based electricity generation is more and more left to domestic financiers.

In developed economies, the number of investment projects in oil and gas extraction and refining activities increased in 2022, in response to the energy crisis. Most of these projects involved expansion, rather than exploration projects. Top destinations included the United States (with a revamp of shale oil projects), the United Kingdom, Australia and Canada. The number of projects in fossil fuel power generation has remained roughly constant since 2016, suggesting that these energy facilities may not be phased out in the near term in developed regions. Conversely, they are likely to become costlier as a result of the need to install carbon capture and storage technologies. For example, in 2022, Kenon (Singapore) announced a $3 billion project to build an 1,800 MW combined-cycle natural gas power station with carbon capture and storage capabilities in West Virginia in the United States.

Although the global trend for new coal-fired and gas-fired power plants is on a downward slope, new projects are still being announced every year. Assuming a trend consistent with the average yearly decrease of 10 per cent seen over the last five years, 10 new projects will still be announced in 2040. Considering that each of these projects has a minimum lifespan of 30 years (and in most cases significantly more), this implies that it will take well into the second half of the century before fossil fuel energy is replaced by renewable energy.

Figure I.27. **Fossil fuels: international investment in developing and developed countries, 2016–2022**
(Billions of dollars, number and per cent)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com) and Refinitiv SA.
Note: Extraction projects include refining activities.

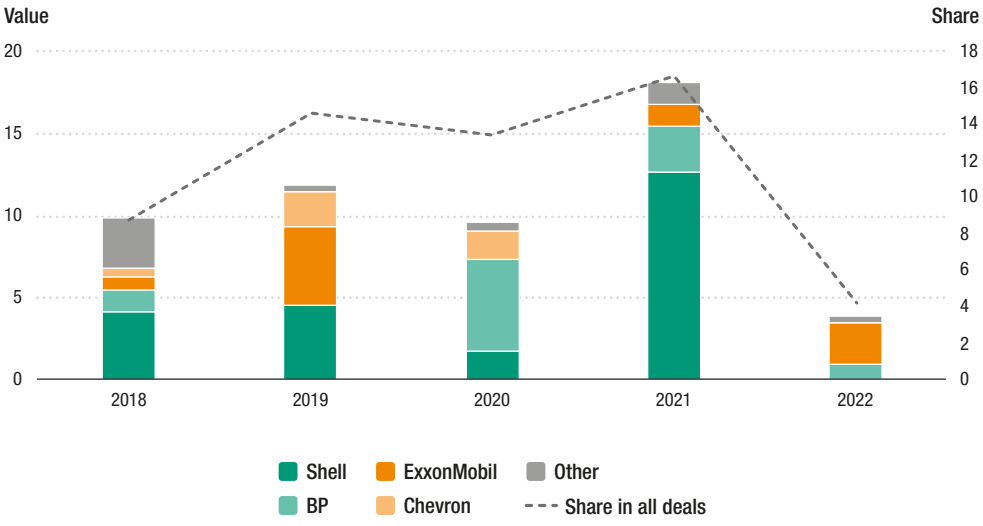
b. Divestment trends

Driven by climate targets, reputational risks and financial considerations, top energy MNEs have pledged to prioritize decarbonization strategies and to reduce their reliance on fossil fuel assets. In the last five years, energy MNEs in UNCTAD's top 100 ranking have been selling fossil fuel assets at a rate of about $15 billion every year, with Shell (United Kingdom) and BP (United Kingdom) leading the trend.[4] Divestments peaked in 2021, when sales of fossil fuel assets by the top eight energy MNEs represented more than 16 per cent of the total value of the oil and gas assets trade (figure I.28). This divestment trend reversed last year as major oil companies slowed sales in light of high energy prices.

Divestment does not imply that oil fields, gas plants and other upstream assets cease operations. The party buying what energy majors sell will typically aim to make that asset generate the highest possible returns. This often means improving the overall productivity of the fossil fuel asset, including by pushing for increased output or extending lifetimes. Another concern is that buyers often have lower or no emission-reduction goals and weaker climate reporting standards, as in the case of private (unlisted) or smaller companies. This would make monitoring oil and gas emissions more difficult, slowing the energy transition.

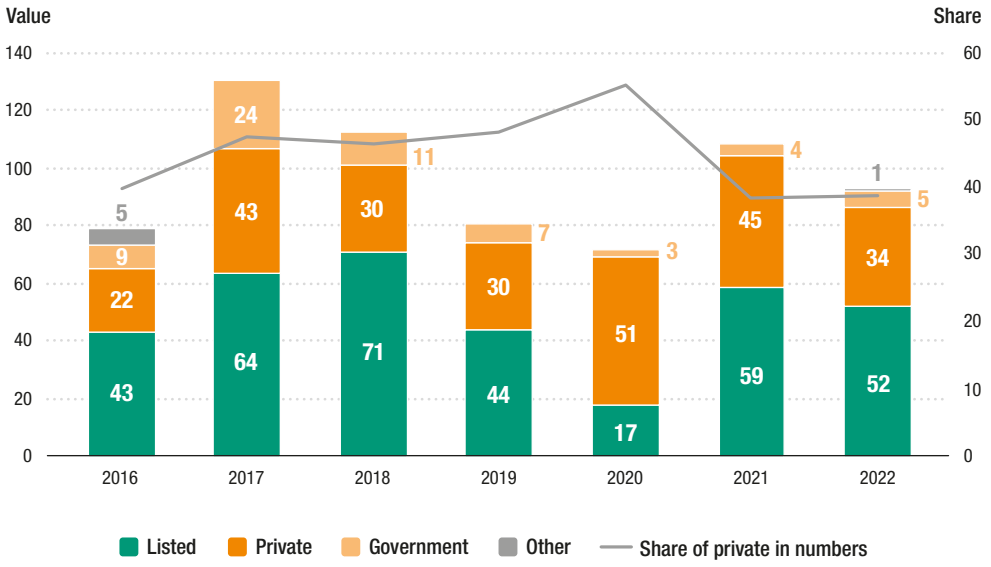
The share of unlisted investors in fossil fuel assets increased between 2016 and 2020, although transactions by major oil and gas companies reversed the trend in 2021 and 2022 (figure I.29). The trend could be underestimated, considering that the values of private transactions often remain undisclosed. Two thirds of private investors are investment and management firms, funds and private equity companies. They also include smaller independent energy companies (in about 20 per cent of cases) and commodity traders such as Trafigura (Singapore) or Vitol (Switzerland). For example, some of the largest sales that top oil and gas MNEs closed in recent years include Shell's sale of North Sea assets to the private equity company EIG Energy Partners (United States) for $3.8 billion in 2017 and ExxonMobil's sale of its North Sea assets to the private equity group HitecVision (Norway) for $1.3 billion in 2021.

Figure I.28. **Upstream fossil fuel asset sales by major energy MNEs, 2018–2022**
(Billions of dollars and per cent)



Source: UNCTAD, based on information from Refinitiv SA.
Note: Other includes TotalEnergies (France), Eni (Italy), Equinor (Norway), OMV (Austria) and Repsol (Spain). Transactions exclude mergers of companies within the sector and spin-offs.

Figure I.29. **Buyers of upstream fossil fuel assets by type, 2016–2022**
(Billions of dollars and per cent)



Source: UNCTAD, based on information from Refinitiv SA.
Note: Transactions exclude mergers of companies within the sector and spin-offs.

Among the private equity firms that have been actively buying fossil fuel assets are the start-up and tech investment fund Investore (Norway), which concluded 15 deals involving upstream assets between 2016 and 2022; the investment firm Blackstone (United States) with 9; and the Carlyle Group (United States), Riverstone (Singapore), Warburg Pincus (United States) and the Canada Pension Plan Investment Board, each with 8 acquisitions.

Although the trend of divesting fossil fuel assets slowed last year, top energy MNEs will continue to reshape their portfolio and energy mix through M&As, which has spurred calls for a new model of climate-aligned dealmaking. Top sellers, such as Shell, BP and Chevron, are well positioned to pilot climate-aligned asset transfers by devising contracts that require buyers to disclose emissions and emission-reduction targets. Institutional investors can require the companies they invest in to incorporate climate safeguards into M&A deal terms, while buyers can commit to enhanced climate disclosure, guarantee best-in-class methane mitigation and flaring reduction, and put up the funds for decommissioning. Banks facilitating these deals can ensure that climate standards are integrated in the transactions (Environmental Defense Fund, 2022; Arnold et al., 2023). An alternative idea that has been put forward is the creation of new financial instruments in the form of "carbon retirement portfolios", which would buy carbon-emitting assets with the commitment to retire them more quickly than their business-as-usual scenario, and with incentives in place to lower greenhouse gas emissions while the assets are still operating (Handler and Bazilian, 2021).

D. INTERNATIONAL PRODUCTION

1. Key indicators of international production

International production indicators showed diverging movements in 2022, with FDI flows and stock lower, but income in foreign affiliates as well as new project values largely stable (table I.18). FDI stock, measured at market value, fell by 6 per cent to $44 trillion, reflecting the poor performance of stock markets around the world. The ratio of FDI stock to global GDP fell to 44 per cent from 49 per cent in 2021. Rates of return (on FDI stock in book value, which increased) fell to 5.9 per cent from 6.5 per cent in 2021, despite the fact that FDI income rose moderately, by 2 per cent, in line with the continued high profit levels of the largest MNEs.

Table I.18. Selected indicators of FDI and international production, 2022 and selected years
(Billions of dollars)

	Value at current prices					
Item	1990	2005–2007 (Pre-crisis average)	2019	2020	2021	2022
FDI inflows	205	1 425	1 708	962	1 478	1 295
FDI outflows	244	1 463	1 401	732	1 729	1 490
FDI inward stock	2 196	14 589	35 971	41 919	47 079	44 253
FDI outward stock	2 255	15 299	34 741	40 144	42 667	39 853
Income on inward FDI[a]	82	1 130	2 017	1 837	2 383	2 434
Rate of return on inward FDI[b]	*5.2*	*9.3*	*6.5*	*5.4*	*6.5*	*5.9*
Income on outward FDI[a]	128	1 244	2 053	1 755	2 411	2 337
Rate of return on outward FDI[b]	*8.4*	*10.6*	*6.6*	*5.1*	*6.6*	*6.1*
Announced greenfield projects	..	744	908	604	739	1 213
International project finance deals	..	..	744	534	1 384	1 044
Cross-border M&As	98	729	507	475	737	707
Sales of foreign affiliates	4 801	19 798	31 049	30 260	..	..
Value added (product) of foreign affiliates	1 074	4 674	6 455	6 463	..	..
Total assets of foreign affiliates	4 649	47 075	91 244	98 863	..	..
Employment by foreign affiliates (thousands)	20 449	49 875	79 927	79 979	..	..
Memorandum:						
GDP	22 612	52 680	87 284	84 895	96 314	100 218
Gross fixed capital formation	5 838	12 482	22 379	21 886	25 061	26 335
Royalties and licence fee receipts	31	191	464	467	520	431

Source: UNCTAD, FDI/MNE database, IMF (2023) and information from the Financial Times Ltd, fDi Markets (www.fDimarkets.com) and Refinitiv SA.
Note: Not included in this table are the value of worldwide sales by foreign affiliates associated with their parent firms through non-equity relationships and the value of the sales of the parent firms themselves. Worldwide sales, gross product, total assets, exports and employment of foreign affiliates are estimated by extrapolating the worldwide data of foreign affiliates of MNEs from countries for which the data is avaiable, on the basis of three-year average shares of those countries in worldwide outward FDI stock.
[a] Based on data from 168 countries for income on inward FDI and 142 countries for income on outward FDI in 2022, in both cases representing more than 90 per cent of global inward and outward stocks.
[b] Calculated only for countries with both FDI income and stock data. The stock is measured in book value.

2. Internationalization trends of the largest MNEs

The degree of internationalization – the ratio of foreign over total assets, sales and employment – of the top 100 MNEs remained stable in 2022 (table I.19). High energy prices boosted revenues of companies in oil and gas, commodity trading and utilities, but this did not translate into higher overseas investment. On the contrary, Chevron and Exxon (both United States) and SaudiAramco (Saudi Arabia) divested foreign assets while increasing domestic investment. European energy companies, including Shell (United Kingdom), BP (United Kingdom) and TotalEnergies (France), continued their divestment of fossil fuel assets. Equinor (Norway) was the exception; it increased investment both domestically and overseas to provide gas supplies to Europe. OMV (Austria) and Repsol (Spain) did not significantly change the level or the geographic distribution of their assets.

Utility MNEs also enjoyed high revenues but were cautious in investing in new overseas projects, discouraged by government measures to shield consumers from higher energy bills, discussions on taxing windfall profits and the general geopolitical uncertainty. For example, despite having a profitable year, Enel (Italy) launched a large asset sale plan (in Latin America, Greece, Spain and Australia) to reduce its debt. RWE (Germany) continued its restructuring to become a renewable-energy-only company, shedding some foreign assets.

Table I.19. Internationalization statistics of the 100 largest non-financial MNEs, worldwide and from developing economies (Billions of dollars, thousands of employees and per cent)

	100 largest MNEs, global					100 largest MNEs, developing economies		
Variable	2020[a]	2021[a]	Change, 2020–2021 (%)	2022[b]	Change, 2021–2022 (%)	2020[a]	2021	Change (%)
Assets (billions of dollars)								
Foreign	9 765	10 428	6.8	10 065	-3.5	2 644	2 927	10.7
Domestic	8 489	8 829	4.0	9 139	3.5	6 009	7 142	18.9
Total	18 254	19 256	5.5	19 204	-0.3	8 653	10 069	16.4
Foreign as share of total (%)	53	54		52		31	29	
Sales (billions of dollars)								
Foreign	5 203	6 681	28.4	7 413	11.0	1 817	2 288	25.9
Domestic	3 999	4 943	23.6	5 552	12.3	3 079	4 243	37.8
Total	9 203	11 624	26.3	12 965	11.5	4 897	6 531	33.4
Foreign as share of total (%)	57	57		57		37	35	
Employment (thousands)								
Foreign	9 261	9 051	-2.3	9 167	1.3	4 107	4 053	-1.3
Domestic	10 132	11 053	9.1	10 833	-2.0	9 112	9 548	4.8
Total	19 393	20 103	3.7	20 000	-0.5	13 219	13 601	2.9
Foreign as share of total (%)	48	45		46		31	30	
Unweighted average TNI	62	62		62		46	47	
Median TNI	62	63		62		44	46	

Source: UNCTAD.

Note: Data refer to fiscal year results reported between 1 April of the base year and 31 March of the following year. Complete 2022 data for the 100 largest MNEs from developing economies is not yet available.

[a] Revised results.

[b] Preliminary results.

In the automotive sector most of the top 100 MNEs enjoyed an increase in revenues and invested overseas in new ventures, often to integrate the supply chain of their electric vehicle production or to expand production capacity. For example, GM (United States) has invested heavily in lithium extraction and refining activities, both domestically and in South America. BMW (Germany) expanded its electric vehicle production facilities in China.

In pharmaceuticals several top MNEs restructured, unwound R&D investments or sold business units. Four – GlaxoSmithKline (United Kingdom), J&J (United States), Sanofi (France) and Novartis (Switzerland) – completed or announced important spinoffs. The largest of these operations involved GlaxoSmithKline spinning off its consumer health care business (jointly owned with the United States MNE Pfizer) to create a new company called Haleon, focused solely on vaccines and prescription drugs.

In the tech industry, only semiconductor MNEs (Intel and Micron Technology, both United States) significantly increased their overseas investment. Global competition and geopolitical tensions pushed the world's largest contract chipmaker, Taiwan Semiconductor Manufacturing Corp to start setting up semiconductor manufacturing facilities in the United States, in Japan and possibly in Europe. Until 2020, it had overseas production facilities only in China and its foreign long-term assets were below $2 billion; at the end of 2022, its foreign assets had already more than quadrupled, to $8.5 billion.

Other top MNEs in the technology sector did not expand their operations abroad, although their revenues continued to grow in 2022. All major United States tech companies – Alphabet, Microsoft, Apple and Amazon – shifted their operational footprint to the domestic market, reducing foreign assets. Asian MNEs, including Tencent (China), Hon Hai (Hong Kong, China), Huawei (China), Samsung (Republic of Korea) and Sony (Japan), also reduced their foreign assets relative to domestic assets.

MNEs in other industries did not experience significant shifts in their internationalization rates. As a result, the average transnationality index did not change in 2022.

One exception was the shipping and logistics company AP Moller-Maersk (Denmark). In recent years, the company has transformed into an integrated logistics service provider, coming back to the top 100 ranking after six years of absence. Other new entries include the business services company AerCap (Ireland), which bought the aviation leasing business of GE (United States) in 2021, as well as the heavy machinery and vehicles manufacturer Volvo (Sweden).

MNEs exiting the ranking in 2022 include the trading house Marubeni (Japan), which divested non-core assets worth more than $3 billion, including the grain business Gavilon Agriculture (United States) for $1.1 billion. The commercial real estate company Unibail-Rodamco-Westfield (France) also exited the ranking after selling its malls in the United States.

With Chinese MNEs still grappling with pandemic measures and supply chain disruptions in 2022, and continued geopolitical tensions, their overseas activity was relatively limited. In the ranking of top MNEs from developing economies, the three largest deals were the acquisition by Petroliam Nasional (Malaysia) of inorganic chemicals manufacturer Perstorp (Sweden) for $2.5 billion, the acquisition by telecommunication company Ooredoo (Qatar) of the wireless telecommunications carrier PT Hutchison 3 Indonesia for $1.7 billion and the acquisition by FEMSA (Mexico) of snack bar operator Valora (Switzerland) for $1.2 billion.

NOTES

1 The 2022 decrease would have been even steeper if the 2021 FDI figures had not been revised downward for Switzerland and the United Kingdom. In the former, revisions derived from corporate restructuring and liquidation of several special-purpose entities and in the latter from changes in statistical methods.

2 The analysis follows a taxonomy of SDG sectors in line with recent UNCTAD studies (see for example UNCTAD's SDG Investment Trends Monitors and various editions of the *WIR*). This taxonomy has the advantage of building on categories that are mutually exclusive (to avoid overlaps and double counting) and collectively (quasi-) exhaustive (i.e. together they cover the bulk of the capital investment needed to achieve the 17 Goals). Unlike in *WIR14*, this approach does not separate climate change investment (in mitigation and adaptation) from investment in other SDG sectors.

3 The nationality of the sponsor defines the type of investment project: if there is only one local sponsor – as it is often the case for Belt and Road Initiative projects where Chinese developers do not appear as sponsors – the project is classified as domestic.

4 The shares of individual companies are indicative, as most upstream assets have multiple owners.