



MONITOR OF CHINESE INFRASTRUCTURE IN LATIN AMERICA AND THE CARIBBEAN 2022

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The current yearly version of the *China Infrastructure Monitor for Latin America and the Caribbean 2022*—in what follows the *Monitor*—is set against the backdrop of a very complex global situation. The palpable effects of global warming on all continents, the uncertain recovery from the COVID-19 pandemic and subsequent disruptions in the global supply chain, as well as high inflation rates, coupled with Russia’s invasion of Ukraine and military tensions between the United States and China over Taiwan, all of which also affect energy and food prices, make for an unstable global socio-economic environment that Latin America and the Caribbean (LAC) will face at least during 2022-2023.

The *Monitor* focuses on providing updated information up to 2021 on China’s infrastructure projects in LAC in two sections and in the interest of allowing an agile reading of the document to delve into the aspects pointed out that were based on the database provided. The two sections of the document examine aspects relevant to understanding China’s infrastructure projects in LAC (first section) and, in more detail, the results of China’s infrastructure projects up to 2021. The *Monitor*’s database continues to enhance and strengthen its quality thanks to the support of the members of the LAC-China Network.

1. Conceptual framework and international context of China’s infrastructure projects in LAC

The *Monitor* insists, as in its 2021 version, that a precise definition of infrastructure projects that were actually carried out (and not just announced) is essential: “*An infrastructure project is understood as a service between a client and a supplier through a contract -usually the result of a bidding process, although the process can be by direct appointment- in which the ownership belongs to the client*” (Dussel Peters 2021:2). The definition of infrastructure projects implies their differentiation with outward foreign direct investment (or OFDI), independently of their financing. The results of the Monitor of Chinese OFDI in Latin America and the Caribbean 2022 are complementary to those presented here.²

¹ The document benefited from the valuable assistance of France Alvarado Fuentes, José Alfredo Reséndiz Ortega, Mariana Sánchez Aguilar and María del Rosario Urbina Medina; the work was coordinated by Leire González Alarcón. The author is solely responsible for the contents.

² It is also relevant to point out that access to even basic information on infrastructure projects -amount and employment- is increasingly restricted, partly as a result of their growing complexity in terms of ownership and



Four aspects seem important to us in understanding the performance of Chinese infrastructure in LAC during the following chapter.

First. The pressure in LAC to close the gap between the demand for infrastructure projects and their effective realization—a topic covered extensively in previous issues of the *Monitor*—has increased significantly in 2021-2022 and during the pandemic recovery period because current public spending has been reduced considerably from 24.7% of GDP in 2020 to 23.8% in 2021, with significant impacts on investment itself, most notably on infrastructure investment, which was just 1.6% during 2010-2019, the lowest in the 21st century mainly under transportation infrastructure (Lardé 2021).

Second. International developments in 2022—i.e., the invasion of Ukraine and disruptions in supply chains—have resulted in exponential increases in transportation costs, generating additional expectations for port and airport infrastructure, among others. UNCTAD (2022/a) reports an increase of 60% in the cost of transporting dry bulk goods during February-May 2022 alone, and expectations for financing renewable infrastructure in the energy sector for the most affected sectors, for example, have increased significantly (UNCTAD 2022/b).

Third. It is important to note that China's infrastructure projects in LAC are reported in the region since the beginning of the 21st century and long before China's recognition of LAC as part of the Belt and Road Initiative (BRI) in 2018. In other words, LAC and China have already been cooperating intensively in multiple areas—trade, financing, OFDI and infrastructure projects, among others. The growing subscription of LAC countries to both the BRI and the Asian Infrastructure and Investment Bank (AIIB) could further enhance China's infrastructure projects in LAC, although their direct impact has yet to be significant.³

Fourth. It is important to consider the deep fall in construction and real estate activity in China, with a share of close to 30% of its GDP. In the second half of 2022, real estate sales could fall by as much as 30% (Yao 2022), with significant effects on its domestic economy and on international demand for mineral products, heavy machinery and chemicals and plastics. While this dynamic could generate greater interest from Chinese companies in carrying out infrastructure projects abroad, both the learning processes and challenges overseas (Weng et. al. 2021), as well as the generalized global uncertainty, have generated a significant decrease in employment among Chinese companies engaged in foreign cooperation of -27.6% in the first five months of 2022 (MOFCOM 2022).

the specific type of transaction (purchase-sale process and/or co-ownership with third parties, term of the transaction, etc.).

³ Of the 182 projects approved by the AIIB—and beyond the multi-country funds—it had only granted financing to two Latin American countries (Brazil and Ecuador) until August 2022 (AIIB 2022).



2. Main results of Chinese infrastructure projects up to 2021

Table 1 shows the main results of infrastructure projects carried out by Chinese companies in LAC. From an aggregate perspective, the 192 projects accumulated until 2021—\$98,383 million dollars and 673,608 jobs—show several characteristics. On the one hand, a clear tendency to increase infrastructure projects: in just the two years 2020-2021—unlike the previous comparative five-year periods—57 projects were carried out, representing 29.69% of the projects during 2005-2021 for an amount of \$32,231 million dollars (or 32.76%) and generating 170,337 jobs (or 25.29% of the employment during 2005-2021). Surely the full five-year period 2020-2024 will be the most significant of the 21st century, cycles and downturns notwithstanding (like in 2021). Second, employment generated per project has steadily declined from 2010-2014 (with 4,004 jobs) to reach 2,988 jobs during 2020-2021. Third, if up to 2015-2019 the ratio of the amount per project had decreased significantly from the previous period, in 2020-2021 it increased again to \$565 million per infrastructure project. These aggregate aspects will be taken up and explained in the following sections.

	Number of infrastructure projects (1)	Amount (million of \$US) (2)	Employment (number of employees) (3)	Amount (2) / project (1)	Amount / employment (2) / (3)	Employment (3) / project (1)
2005-2009	10	1,533	21,312	153	0.07	2,131
2010-2014	42	25,259	168,156	601	0.15	4,004
2015-2019	83	39,360	313,803	474	0.13	3,781
2020-2021	57	32,231	170,337	565	0.19	2,988
2005-2021	192	98,383	673,608	512	0.15	3,508
2018	15	4,914	21,903	328	0.22	1,460
2019	40	19,235	213,833	481	0.09	5,346
2020	29	25,593	155,933	883	0.16	5,377
2021	28	6,638	14,404	237	0.46	514

Source: own elaboration based on *Monitor*.

The information on China's infrastructure projects in LAC by country (Table 2) reflects the enormous wealth—and potential—of the databank offered in the *Monitor*. Only one group of aspects stand out. First, the diversification process highlighted in previous issues of the *Monitor* has been exacerbated for the most recent period 2020-2021: if Brazil alone concentrated 43.63% of the amount of infrastructure projects in 2005-2009 (and 34.49% of employment), the amount plummeted to 18.37% in 2020-21 (and 40.05% of employment). In the recent period since 2015, countries that had received virtually no Chinese infrastructure projects increased their penetration significantly, namely Bolivia, Chile, Colombia, Ecuador, Mexico and Peru. Second, Brazil continues to be a crucial recipient of Chinese infrastructure projects in LAC during 2020-2021 and in each of the defined sub-periods, when, according



to their amount, there is Argentina (representing 43.35% received by LAC and above Brazil), Chile (14.68%), Mexico (9.40%) and Colombia (6.87%). Third, diversification by country also implies different project characteristics, as will be seen below. While for 2005-2021 Brazil presents ratios of amount and employment per project of \$531 million dollars and 5,325 jobs, the case of Chile stands out, with ratios of \$947 million dollars and 967 jobs per project in 2020-2021. These differences are closely linked to the sectoral specialization and ownership of Chinese companies, as will be seen below.

The deep sectoral diversification of China's infrastructure projects in LAC during 2005-2021 has been one of the main changes reflected in the current version of the *Monitor*. If for the 2005-2009 period six of the 10 infrastructure projects were concentrated in energy—representing 78.44% of the amount and 85.16% of the employment generated—, by 2020-2021 this was reduced to 29.52% and 10.83%, respectively. While the energy sector still plays a crucial role in China's energy infrastructure projects, these have also changed substantially: historically gas, mining and oil projects were considerable; of the 13 energy projects during 2020-2021, several are renewable energy projects (solar) for amounts of less than \$100 million, and one is nuclear power. As a contrast, the sector that has grown the most in China's infrastructure projects in LAC from 2015-2019 is transportation: ports, airports, railway projects, highways and several others, also consistent with China's experience since the “reform and opening up” period and the Belt and Road Initiative itself since 2013. In 2020-2021, 36 of the 57 infrastructure projects were under this heading, accounting for 57.66% of the amount and 86.44% of the employment generated. Table 3 also reflects that during 2020-2021 transportation infrastructure projects generated 4,090 jobs per project—well above the other sectors considered in Table 3—, which is crucial in understanding the increase in employment generation per project for the most recent period as highlighted above.



Table 2
Latin America and the Caribbean: Chinese infrastructure projects by main countries and group of countries (2005- 2021)

	2005-2009	2010-2014	2015-2019	2020-2021	2005-2021	2018	2019	2020	2021
TOTAL									
Number of infrastructure projects (1)	10	42	83	57	192	15	40	29	28
Amount (million of \$US) (2)	1,533	25,259	39,360	32,231	98,383	4,914	19,235	25,593	6,638
Employment (number of employees) (3)	21,312	168,156	313,803	170,337	673,608	21,903	213,833	155,933	14,404
Amount (2) / project (1)	153	601	474	565	512	328	481	883	237
Amount / employment (2) / (3)	0.07	0.15	0.13	0.19	0.15	0.22	0.09	0.16	0.46
Employment (3) / project (1)	2,131	4,004	3,781	2,988	3,508	1,460	5,346	5,377	514
ARGENTINA									
Number of infrastructure projects (1)	0	2	17	9	28	4	5	6	3
Amount (million of \$US) (2)	0	3,090	9,118	13,971	26,179	1,553	590	13,828	143
Employment (number of employees) (3)	0	4,540	26,315	42,030	72,885	4,105	3,500	41,730	300
Amount (2) / project (1)	---	1,545	536	1,552	935	388	118	2,305	48
Amount / employment (2) / (3)	---	0.68	0.35	0.33	0.36	0.38	0.17	0.33	0.48
Employment (3) / project (1)	---	2,270	1,548	4,670	2,603	1,026	700	6,955	100
BOLIVIA									
Number of infrastructure projects (1)	1	7	8	2	18	1	2	1	1
Amount (million of \$US) (2)	44	1,479	3,737	498	5,758	188	655	253	245
Employment (number of employees) (3)	0	2,884	34,130	1,400	38,414	2,210	6,800	400	1,000
Amount (2) / project (1)	--	211	467	249	320	188	327	--	245
Amount / employment (2) / (3)	--	0.51	0.11	0.36	0.15	0.09	0.10	--	0.25
Employment (3) / project (1)	--	412	4,266	700	2,134	2,210	3,400	--	1,000
BRAZIL									
Number of infrastructure projects (1)	2	4	11	13	30	4	3	5	8
Amount (million of \$US) (2)	669	2,020	7,322	5,922	15,933	1,156	2,764	5,100	822
Employment (number of employees) (3)	7,350	57,726	26,453	68,222	159,751	3,789	1,600	66,372	1,850
Amount (2) / project (1)	335	505	666	456	531	289	921	1,020	103
Amount / employment (2) / (3)	0.09	0.03	0.28	0.09	0.10	0.31	1.73	0.08	0.44
Employment (3) / project (1)	3,675	14,432	2,405	5,248	5,325	947	533	13,274	231
CHILE									
Number of infrastructure projects (1)	0	0	5	5	10	1	2	4	1
Amount (million of \$US) (2)	0	0	737	4,733	5,470	8	509	1,733	3,000
Employment (number of employees) (3)	0	0	5,696	4,837	10,533	0	4,826	2,337	2,500
Amount (2) / project (1)	--	--	147	947	547	--	255	433	3,000
Amount / employment (2) / (3)	--	--	0.13	0.98	0.52	--	0.11	0.74	1.20
Employment (3) / project (1)	--	--	1,139	967	1,053	--	2,413	584	2,500
COLOMBIA									
Number of infrastructure projects (1)	0	0	3	8	11	1	2	3	5
Amount (million of \$US) (2)	0	0	5,163	2,214	7,377	652	4,511	1,665	549
Employment (number of employees) (3)	0	0	26,742	24,370	51,112	9,624	17,118	22,100	2,270
Amount (2) / project (1)	--	--	1,721	277	671	652	2,256	555	110
Amount / employment (2) / (3)	--	--	0.19	0.09	0.14	0.07	0.26	0.08	0.24
Employment (3) / project (1)	--	--	8,914	3,046	4,647	9,624	8,559	7,367	454
ECUADOR									
Number of infrastructure projects (1)	0	10	9	0	19	0	4	0	0
Amount (million of \$US) (2)	0	5,258	3,162	0	8,420	0	2,234	0	0
Employment (number of employees) (3)	0	46,096	17,552	0	63,648	0	5,873	0	0
Amount (2) / project (1)	--	526	351	--	443	--	559	--	--
Amount / employment (2) / (3)	--	0.11	0.18	--	0.13	--	0.38	--	--
Employment (3) / project (1)	--	4,610	1,950	--	3,350	--	1,468	--	--
MEXICO									
Number of infrastructure projects (1)	0	0	9	12	21	1	7	7	5
Amount (million of \$US) (2)	0	0	2,132	3,031	5,163	7	2,117	2,817	214
Employment (number of employees) (3)	0	0	142,567	21,689	164,256	0	142,567	21,489	200
Amount (2) / project (1)	--	--	237	253	246	7	302	402	43
Amount / employment (2) / (3)	--	--	0.01	0.14	0.03	--	0	0.13	1.07
Employment (3) / project (1)	--	--	15,841	1,807	7,822	0	20,367	3,070	40
PERÚ									
Number of infrastructure projects (1)	0	0	8	2	10	1	5	0	2
Amount (million of \$US) (2)	0	0	1,164	21	1,185	11	559	0	21
Employment (number of employees) (3)	0	0	5,363	784	6,147	0	5,039	0	784
Amount (2) / project (1)	--	--	146	11	119	11	112	--	11
Amount / employment (2) / (3)	--	--	0.22	0.03	0.19	--	0.11	--	0.03
Employment (3) / project (1)	--	--	670	392	615	0	1,008	--	392

Source: own elaboration based on *Monitor*.



Table 3
Latin America and the Caribbean: Chinese infrastructure projects by sector (2005-2021)

	Number of infrastructure projects (1)	Amount (million of \$US) (2)	Employment (number of employees) (3)	Amount (2) / project (1)	Amount / employment (2) / (3)	Employment (3) / project (1)
2005-2009	10	1,471	22,007	147	0.07	2,201
Energy	6	1,154	18,741	192	0.06	3,124
Telecommunications	0	0	0	--	--	--
Transportation	1	65	3,000	65	0.02	3,000
Other	3	252	266	84	0.95	89
2010-2014	42	25,259	168,156	601	0.15	4,004
Energy	19	16,758	114,709	882	0.15	6,037
Telecommunications	1	302	78	302	3.87	78
Transportation	14	6,162	37,881	440	0.16	2,706
Other	8	2,038	15,488	255	0.13	1,936
2015-2019	83	39,360	313,803	474	0.13	3,781
Energy	37	24,445	88,349	661	0.28	2,388
Telecommunications	9	867	6,750	96	0.13	750
Transportation	28	12,978	205,422	464	0.06	7,337
Other	9	1,070	13,282	119	0.08	1,476
2020-2021	57	32,231	170,337	565	0.19	2,988
Energy	13	9,514	18,446	732	0.52	1,419
Telecommunications	2	3,002	2,700	1,501	1.11	1,350
Transportation	36	18,586	147,241	516	0.13	4,090
Other	6	1,129	1,950	188	0.58	325
2005-2021	192	94,090	600,663	490	0.16	3,128
Energy	53	40,300	211,854	760	0.19	3,997
Telecommunications	8	934	1,852	117	0.50	232
Transportation	58	26,817	229,846	462	0.12	3,963
Other	73	26,039	157,111	357	0.17	2,152

Source: own elaboration based on *Monitor*.

The information provided by *Monitor* reflects that the omnipresence of the Chinese public sector (Dussel Peters 2022), particularly in its proprietorship, has initiated a slow process of diversification in the case of infrastructure projects in LAC. During the 2005-2021 period, privately owned Chinese companies accounted for \$12,534 million and 164,180 jobs in Chinese infrastructure projects in LAC (or 12.74% and 24.37%, respectively); the first Chinese private initiative transactions only started just in 2017 and have expanded rapidly. In the most recent 2020-2021 period, 24 private infrastructure projects comprised 16.85% and 3.76% of the amount and employment of Chinese projects in LAC; it is striking that private infrastructure projects present ratios of amount and employment per project far below publicly owned projects. Notwithstanding the above, the public sector, specifically the central government in the case of infrastructure projects, continues to have an overwhelming presence, accounting for 83.15% and 96.24% of the amount and employment during 2020-2021 (Table 4).



Table 4
Latin America and the Caribbean: Chinese infrastructure projects by type of property (2005-2021)

	Number of infrastructure projects (1)	Amount (million of \$US) (2)	Employment (number of employees) (3)	Amount (2) / project (1)	Amount / employment (2) / (3)	Employment (3) / project (1)
2005-2009	10	1,533	21,312	153	0.072	2,131
Public property	10	1,533.1	21,312	153	0.072	2,131
Central government	8	1,325	21,046	166	0.063	2,631
Other	2	208	266	104	0.782	133
Private property	0	0	0	--	--	--
2010-2014	42	25,259	168,156	601	0.150	4,004
Public property	42	25,259	168,156	601	0.150	4,004
Central government	41	25,109	166,156	612	0.151	4,053
Other	1	150	2,000	150	0.075	2,000
Private property	0	0	0	--	--	--
2015-2019	83	39,360	313,803	474	0.125	3,781
Public property	55	32,258	156,022	587	0.207	2,837
Central government	53	31,857	154,422	601	0.206	2,914
Other	2	401	1,600	201	0.251	800
Private property	28	7,103	157,781	254	0.045	5,635
2020-2021	57	32,231	170,337	565	0.189	2,988
Public property	33	26,799	163,938	812	0.163	4,968
Central government	33	26,799	163,938	812	0.163	4,968
Other	0	0	0	--	--	--
Private property	24	5,432	6,399	226	0.849	267
2005-2021	192	98,383	673,608	512	0.146	3,508
Public property	140	85,849	509,428	613	0.169	3,639
Central government	135	85,090	505,562	630	0.168	3,745
Other	5	759	3,866	152	0.196	773
Private property	52	12,534	164,180	241	0.076	3,157

Source: own elaboration based on *Monitor*.

One of the most recent contributions of the *Monitor* refers to the growing geographic diversification according to the headquarters of the Chinese company carrying out the infrastructure project in LAC. Historically, and for example in the period 2010-2014, companies based in Beijing concentrated 91.41% of the amount and 79.53% of the employment generated by infrastructure projects; they were 83.87% and 72.32% for the entire period 2005-2021. In other words, in line with the process of diversification according to ownership, Beijing has been slowly losing its presence as the main base for Chinese companies carrying out infrastructure projects in LAC. This process, however, has been slow and has presented counter-trends: In 2020-2021, for example, Beijing-based companies concentrated and regained 83.15% of the amount and 96.24% of the employment generated (Table 5). Guangdong and Shanghai are playing an increasingly relevant role in China's infrastructure projects in LAC, mostly with smaller scale and privately owned projects in the energy sector.



Table 5
Latin America and the Caribbean: Chinese infrastructure projects by geographic location (2005-2021)

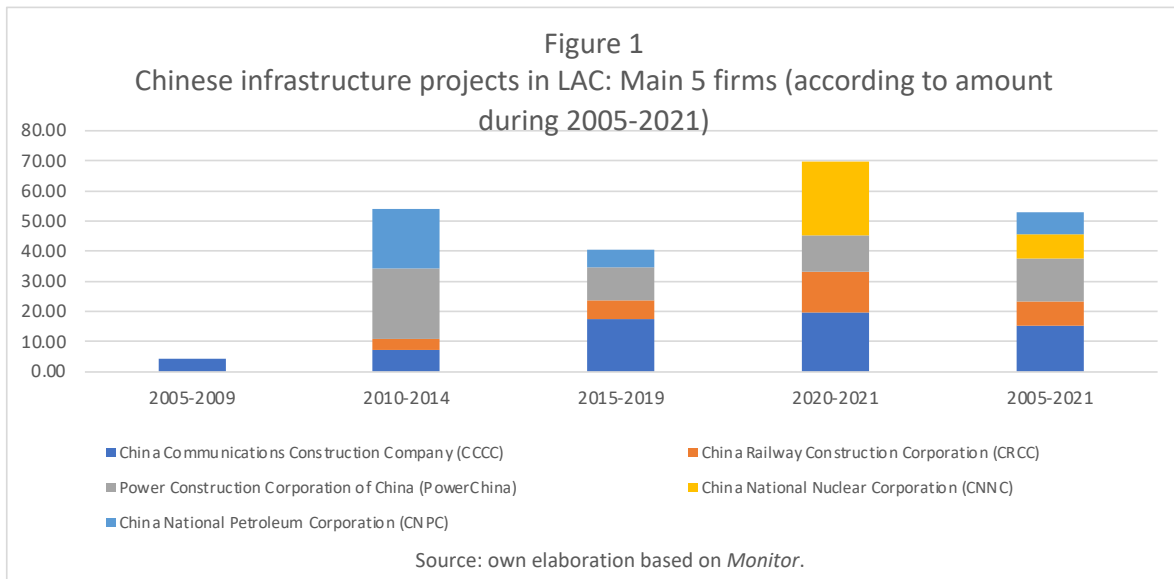
	2005-2009	2010-2014	2015-2019	2020-2021	2005-2021
Total					
Number of infrastructure projects (1)	10	42	83	57	192
Amount (million of \$US) (2)	1,533	25,259	39,360	32,231	98,383
Employment (number of employees) (3)	21,312	168,156	313,803	170,337	673,608
Amount (2) / project (1)	153	601	474	565	512
Amount / employment (2) / (3)	0.07	0.15	0.13	0.19	0.15
Employment (3) / project (1)	2,131	4,004	3,781	2,988	3,508
Beijing					
Number of infrastructure projects (1)	8	37	52	32	129
Amount (million of \$US) (2)	1,325	23,089	31,302	26,799	82,515
Employment (number of employees) (3)	21,046	147,538	154,647	163,938	487,169
Amount (2) / project (1)	166	624	602	837	640
Amount / employment (2) / (3)	0.06	0.16	0.20	0.16	0.17
Employment (3) / project (1)	2,631	3,988	2,974	5,123	3,777
Guangdong					
Number of infrastructure projects (1)	0	0	6	11	17
Amount (million of \$US) (2)	0	0	192	4,946	5,138
Employment (number of employees) (3)	0	0	240	3,750	3,990
Amount (2) / project (1)	-	-	32	450	302
Amount / employment (2) / (3)	-	-	0.80	1.32	1.29
Employment (3) / project (1)	-	-	40	341	235
Shanghai					
Number of infrastructure projects (1)	2	1	7	4	14
Amount (million of \$US) (2)	208	150	2,641	176	3,175
Employment (number of employees) (3)	266	2,000	6,700	499	9,465
Amount (2) / project (1)	104	150	377	44	227
Amount / employment (2) / (3)	0.78	0.08	0.39	0.35	0.34
Employment (3) / project (1)	133	2,000	957	125	676
Hubei					
Number of infrastructure projects (1)	0	0	4	0	4
Amount (million of \$US) (2)	0	0	411	0	411
Employment (number of employees) (3)	0	0	5,000	0	5,000
Amount (2) / project (1)	-	-	103	-	103
Amount / employment (2) / (3)	-	-	0.08	-	0.08
Employment (3) / project (1)	-	-	1,250	-	1,250
Heilongjiang					
Number of infrastructure projects (1)	0	3	0	0	3
Amount (million of \$US) (2)	0	1,208	0	0	1,208
Employment (number of employees) (3)	0	17,467	0	0	17,467
Amount (2) / project (1)	-	403	-	-	403
Amount / employment (2) / (3)	-	0.07	-	-	0.07
Employment (3) / project (1)	-	5,822	-	-	5,822

Source: own elaboration based on *Monitor*.

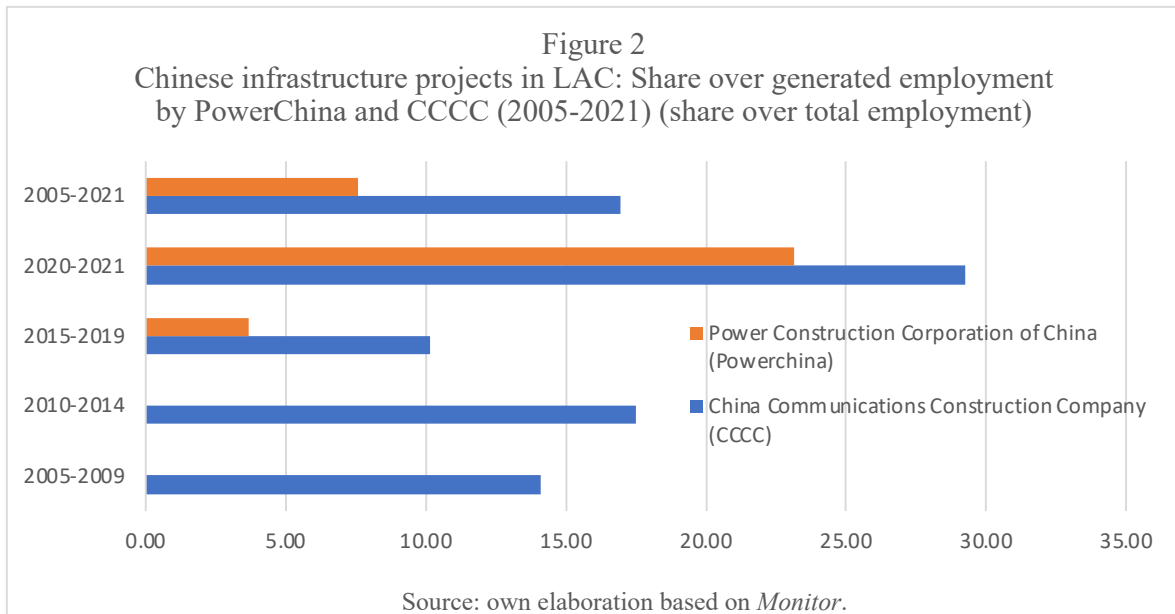


Finally, the Monitor's database provides information at the company level and makes it possible, for example, to highlight the main Chinese companies participating in infrastructure projects in LAC by amount and employment generated.

Under the first heading, primary Chinese companies according to the amount of infrastructure projects during 2005-2021, all of the top five companies are central government public companies: China Communications Construction Company (CCCC), China Railway Construction Corporation (CRCC), Power Construction Corporation of China (or PowerChina, which includes Sinohydro), China National Nuclear Corporation (CNNC) and China National Petroleum Corporation (CNPC). Graph 1 reflects the growing presence of these five companies according to the amount of infrastructure projects that increased from 4.24% in 2005-2009 to 69.87% in 2020-2021; for the period 2005-2021 only two companies (CCCC and PowerChina) accounted for 29.73% of the amount of all Chinese infrastructure projects in LAC.



From the perspective of the top five companies generating employment via Chinese infrastructure projects in LAC during 2005-2021, there are some coincidences with the previous section according to their amount—CCCC, PowerChina and CRCC—, in addition to China Railway Engineering Company (CREC) and State Grid Corporation of China (SGCC). These five companies accounted for 25.01% of the total employment generated via infrastructure projects during 2015-2019 and increased to 84.81% in 2020-2021; only CCCC and PowerChina generated 52.41% for the most recent period (Figure 2).



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