

Below is a summary of some updates we made to the China Overseas Finance Inventory (COFI) Database published on February 22, 2022 (COFI_v1.0). The structure of the updated database (COFI_v2.0) remained fundamentally the same. COFI_v2.0 includes three major updates: adding an additional database called IJ Global Infrastructure Finance (the “*IJ Global*”), adding 2021 data, and updating Belt and Road Initiative (BRI) countries. In addition, we also include a summary of changes in the document.

Adding a new source database to COFI

This section focuses on the new source database, IJ Global. It includes a description of its scope and methodology, its added value to COFI, and the integration methods used.

IJ Global is a database of infrastructure finance at the transaction level. It has over 12,000 transactions and 10,000 projects in the power sector (IJ Global 2022). The data are collected either through research by its data analysts or through deals submitted by project parties themselves (IJ Global n.d.). WRI has permission from IJ Global to publish underlying data to the public.

COFI_v 2.0 made three types of updates based on information from IJ Global:

- New investment projects not captured in COFI v1.0.
- Additional project information, including individual equity investment amounts and years, as well as debt investment information for some projects.
- Additional Chinese investors and their investment activities, such as the Silk Road Fund and the China Co-financing Fund for Latin America and the Caribbean.

We follow the manual matching section from the COFI technical note in matching IJ Global’s data. Its underlying data for each transaction is structured easily to filter out Chinese involvement and their individual amount. Three bilingual analysts filtered out Chinese investment to BRI countries and manually matched these to COFI, cross-checking the results.¹ Unmatched projects were then added to COFI as new investments.

Updating 2021 data from original source databases

We updated 2021 data from seven of the nine source databases included in COFI_v1.0. The China’s Global Power Database (from Boston University) did not have any updates at the time of COFI_v2.0 release, while the Global Power Plant Database (GPPD) will not have subsequent updates. We identified new investments from Refinitiv Eikon Loan and fDi Market Database from Financial Times. Although updated in 2022, other source databases (China’s Global Energy Finance, Chinese Loans to Africa Database (updates up to 2020 loans), China–Latin America Finance and Refinitiv Eikon Merger and Acquisition database) showed no new Chinese investments in BRI countries. We obtained updated power plant information from the S&P Global Market Intelligence World Electric Power Plants Database (WEPP) 2021 update. We followed the same steps of data-preprocessing described in the corresponding technical note for these new data, and then manually added these to COFI_v2.0.

We also obtained updated information regarding the scope of one of our source databases: China Global Energy Finance (CGEF) database from Boston University. The CGEF only includes policy bank lending to public borrowers (who has any proportion of government ownership from recipient countries) (Ma, Springer, and Shao 2022). The scope of CGEF is different from COFI, which includes any project financed by a Chinese firm and/or a financial institution outside of China.

This scope difference is important because it explains why certain projects were not included in the 2021 update in CGEF but included in COFI_v2.0. CGEF database showed no new coal debt investment made to projects with majority public ownership by China’s policy banks in 2021. However, IJ Global and Refinitiv loan recorded a new Chinese financed coal-fired power plant: Khottar Char (or Barisal) in Bangladesh. CGEF database excluded this project because the Bangladesh government does not have ownership of the project, but COFI included it (Ma, Springer, and Shao 2022).

Updating Belt and Road Initiative Country Lists

There were 141 BRI countries as of January 2021 when we built COFI_v1.0. The number of BRI countries increased to 149 in March 2022 after eight more countries signed the Memorandum of Understanding with the Chinese government (yidaiyilu 2022). Thus COFI_v2.0 included 12 new entries from the four of the eight new BRI countries: Argentina, Central Africa Republic, Eritrea, and Malawi. There is no record of power investment in the other four new BRI countries from China.

¹ We adopt the same procedure and standards for manual match in our technical note.

Dealing with Inconsistency:

Adding a new database and updating data meant checking for conflicting information from different source databases, similar to the issues faced in building COFI_v1.0. The method is described in the corresponding [Technical Note](#), and here we describe how it is applied to the hierarchy of information in the new data (Table 1).

- Power plant characteristics:
 - We used WEPP as it has the most detailed information on power plants.
 - If information was not available from WEPP, we used information from the plant's official website.
 - If information was not available from both WEPP and the plant's official website, we relied on information from IJ Global and COFI_v1.0.
- If investment amount was different:
 - We used IJ Global when it had the actual individual investment amount available for each participant of the deal (non-estimated).
 - If IJ Global estimated the individual investment amount using total investment amount averaged, we checked to see if Refinitiv had non-estimated amount and, if so, used Refinitiv
 - If both IJ Global and Refinitiv estimated the amount, and the plant matched an existing entry in COFI_v1.0, we kept the original information from COFI_v1.0
 - If the entry is a new addition in COFI_2.0, we verified the investment amount with additional sources, and decided based on the source closest to the project itself (official website, government report, investor report, official news report).

Table 1 Hierarchy of Information Source when Dealing with any Inconsistency

| Hierarchy of Information ^a | Power plant characteristics information | Investment Amount |
|---------------------------------------|---|--|
| 1 | WEPP | IJ Global non-estimated ^b |
| 2 | Plant's official website | Refinitiv non-estimated |
| 3 | IJ Global | COFI_v1.0 |
| 4 | COFI_v1.0 | Additional research: official website; government report; investor website; official news report |

Note: ^aHierarchy of information is the order of preference of sources we choose from when resolving conflicting information

^bNon-estimated means the individual investment amount is directly available

Changes in COFI results

In COFI_v2.0, there are 524 entries and 509 power plants in 82 BRI countries. Table 1 below shows a comparison of key indicators between COFI_v1.0 and COFI_v2.0. COFI_2.0 includes 584 investments (319 debt investments and 265 equity investments)². The types of generation technology remain the same at 11. COFI_2.0 has 165 fossil fuel plants, 343 non-fossil fuel plants, and one plant with unknown fuel type³.

Table 2 Comparison of Results COFI 1.0 and COFI 2.0

| Fuel Type | Number of Observations | | Number of Plants | | Installed Capacity (GW) | |
|---------------|------------------------|------------|------------------|------------|-------------------------|---------------|
| | COFI_v1.0 | COFI_v2.0 | COFI_v1.0 | COFI_v2.0 | COFI_v1.0 | COFI_v2.0 |
| biomass | 3 | 3 | 3 | 3 | 0.06 | 0.06 |
| coal | 87 | 101 | 84 | 98 | 71.81 | 84.21 |
| gas | 42 | 51 | 42 | 51 | 24.72 | 34.35 |
| geothermal | 11 | 13 | 10 | 12 | 1.08 | 2.05 |
| hydro | 146 | 157 | 139 | 149 | 33.21 | 33.09 |
| nuclear | 3 | 3 | 3 | 3 | 3.21 | 3.30 |
| offshore wind | 1 | 5 | 1 | 5 | 0.06 | 0.30 |
| oil | 10 | 13 | 10 | 13 | 3.28 | 4.55 |
| onshore wind | 49 | 65 | 49 | 64 | 2.7 | 4.67 |
| solar csp | 3 | 3 | 2 | 2 | 0.9 | 0.90 |
| solar pv | 86 | 109 | 86 | 108 | 8.4 | 11.68 |
| unknown | 2 | 1 | 1 | 1 | 0.10 | 0.10 |
| Total | 443 | 524 | 430 | 509 | 149.53 | 179.26 |

Note: The number of investments is greater than the number of observations because some observations record both a debt and an equity investment made to the same project.

COFI_2.0 now includes 147 IJ Global entries. 77 of them are for new power plants not included in COFI_v1.0, with the remainder matched to existing power plants in COFI_v1.0. Refinitiv-Loan 2021 update includes 4 new entries. fDi market includes 2 new entries. All power plants with Platts ID were checked again with the 2021 version of WEPP to reflect any updated commissioning year or capacity. Three power plants (one solar pv, one hydro, and one coal) were deleted because Platts and additional research showed that they had been cancelled⁴.

Reference List:

IJ Global. 2022. "Transaction Data | IJGlobal - Infrastructure Journal and Project Finance Magazine." 2022. <https://www.ijglobal.com/data/search-transactions>. Accessed May 23, 2022.

IJ Global. n.d. "League Table Criteria | IJGlobal." <https://www.ijglobal.com/LeagueTable/Criteria>. Accessed May 23, 2022.

Ma, X., C.H. Springer, and H. Shao. 2022. "Outlier or New Normal? Trends in China's Global," https://www.bu.edu/gdp/files/2022/03/GCI_PB_011_FIN.pdf. Accessed May 23, 2022

Belt and Road Portal. 2022. "已同中国签订共建‘一带一路’合作文件的国家一览 - 中国一带一路网." [Countries That Have Signed Co-Developing Belt and Road Collaboration documents with China] February 7, 2022. <https://www.yidaiyilu.gov.cn/xwzx/roll/77298.htm>. Accessed May 23, 2022

² This is to compare with COFI_v1.0 result: 443 observations for 430 power plants in 76 BRI countries, and 473 equity and debt investments (253 debt investments and 220 equity investments).

³ This is to compare with COFI_v1.0 result: 136 fossil fuel power plants, 293 non-fossil fuel power plants, and one power plant with an unknown fuel source.

⁴ The uniqueIDs of the cancelled projects are: PAK2021024; VNM2021016; ETH2021013