The Greenfield IPP Database (GRIPP): Based on the World Bank's Private Participation in Infrastructure (PPI) Database

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Introduction

The Greenfield IPP (GRIPP) database is derived from the World Bank's Private Participation in Infrastructure (PPI) database.[1] This paper presents the definitions used by the World Bank and the procedures that we used to in order to make the PPI database reflect on greenfield electricity projects. The primary motivation for this work was to extract foreign participation in greenfield IPPs for the purposes of a larger study.

PPI Database

Further information on the PPI database, which includes all infrastructure sectors, can be obtained from http://www.worldbank.org/html/fpd/infrastructure/privatesector/ and following the links to the discussion of the PPI database. The following descriptions and definitions have been developed from World Bank sources.

Database Coverage

- Projects that have reached financial closure and directly or indirectly serve the public.
- Projects in energy (electricity and natural gas), telecommunications, transport, and water and sewerage. Small projects, such as windmills, and movable assets (buses/airplanes) are excluded.
- Projects developed in low- and middle-income countries, as defined and classified by the World Bank.

[1] The GRIPP database can be accessed through the Research section of the PESD website at http://pesd.stanford.edu.

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Definition of Private Participation

The private company must assume either operating risk during the operating period or development and operating risk during the contract period. A foreign state-owned company is considered a private entity.
Projects that DO NOT meet private participation criteria include:

- Supply and civil work contracts
- Technical assistance contracts
- Subcontracting or contracting out
- Turnkey contracts

Definition of Private Sponsor

Project sponsors are the private entities that take market and operation risk of the project. To be considered a private sponsor in the PPI database, the private entity should own at least a 15% stake in the infrastructure project, except for cases of highly diversified (but largely private) ownership.

Definition of a Project Unit

A corporate entity created to build and/or operate infrastructure facilities is considered a project. When two or more physical facilities are operated by the corporate entity, all are considered as one project.

Classification of Projects

The PPI database classifies private infrastructure projects as follows:

1. Management and Operation (M&O) Contracts
2. M&O with Major Private Capital Expenditure (Concessions)
3. Greenfield Projects
4. Divestitures

These project types do not fully reflect contract arrangements in each infrastructure sector. However, these broad categories represent the variety of contracts across all infrastructure sectors.

Management and Operation Contracts (M&O Contracts)

A private entity takes over the management of a state-owned enterprise for a given period. The facility is always owned by the public sector. Key features of this contract type are:

- Public ownership
- Private operation
- Public capital expenditure
- Public and/or private operating expenditure

There are two sub-classes of M&O contracts: management contracts, where the government pays a private operator to manage the facility and takes on most of the operating risk; and lease-operate contracts, where a private operator pays a fee to the government for the right to manage the facility and takes on most of the operating risk.

M&O with Major Private Capital Expenditure (Concessions)

A private entity takes over the management of a state-owned enterprise for a given period during which it also assumes significant investment risk. Key features of this contract type are:

- Public ownership
- Private operation
- Private capital expenditure
- Private operating expenditure

There are five sub-classes of M&O contracts with major capital expenditure:

1. BTO (Build, Transfer, Operate): A turnkey project whose ownership is immediately transferred to public sector, but which is managed by a private operator.
2. BLT (Build, Lease or Rent, Transfer): A project in which a private developer builds a new facility at its own risk, leases that facility from its government owner, and then operates and maintains the facility for a given period.
3. ROT (Rehabilitate, Operate, Transfer): A project in which a private developer rehabilitates an existing facility at its own risk, and then operates and maintains the facility at its own risk for a given period.
4. RLT (Rehabilitate, Lease or Rent, Transfer): A project in which a private developer rehabilitates an existing facility at its own risk, leases or rents the facility from the government owner, and then operates and maintains the facility at its own risk for a given period.

5. BROT (Build, Rehabilitate, Operate, Transfer): A project in which a private developer builds an add-on to an existing facility or completes a partially built facility and rehabilitates existing assets, and then operates and maintains the facility at its own risk for a given period.

Greenfield Projects

A private entity or a public-private joint venture builds and operates a new facility for a given period specified in the project contract. The facility may return to the public sector at the end of the concession period. Key features of this contract type are:

- Private or mixed ownership
- Private or mixed operation
- Private or mixed or mixed capital expenditure
- Private or mixed operating expenditure

There are four sub-classes of greenfield projects:

1. BLO (Build, Lease, Own): A project in which the private developer builds a new facility at its own risk, transfers ownership to the government, leases the facility from the government and operates it at its own risk, and then receives full ownership of the facility at the end of the concession period. In the case of electricity generating capacity, the government usually provides revenue guarantees through long-term take-or-pay contracts for bulk power supply
2. BOT (Build, Own, Transfer) or BOOT (Build, Own, Operate, Transfer): A project in which the private developer builds a new facility at its own risk, owns and operates the facility at its own risk, and then transfers ownership of the facility to the government at the end of the concession period. The government usually provides revenue guarantees through long-term take-or-pay contracts.
3. BOO (Build, Own, Operate): A project in which the private developer builds, owns and operates a new facility at its own risk. The government usually provides revenue guarantees through long-term take-or-pay contracts for bulk supply facilities or minimum traffic revenue guarantees.
4. Merchant: A project in which the private developer builds a new facility in a liberalized market where the government does not provide any revenue guarantee. The private developer assumes construction, operation, and market risk of the project.

Divestitures

A private consortium buys an equity stake in a state-owned enterprise through an asset sale, public offering or mass privatization program. Key features of this contract type are:

- Private or mixed ownership (when a minority stake in state-owned company is divested through a public offering or a mass privatization program)
- Private, Mixed or Public Operation
- Private or Mixed Capital Expenditure
- Operating Expenditure: Private or Mixed

There are two sub-classes of divestitures. Full divestiture is when government transfers 100% of the equity in the state-owned company to private entities (operator, institutional investors, etc.). Partial divestiture is when government transfers part of the equity in the state-owned company to private entities (operator, institutional investors, etc.). The private stake may or may not imply private management of the facility.

Project Investment

Investments and privatization revenues generally have been recorded on a commitment basis in the year of financial closure (for which data is typically readily available). Financial closure is when all agreements, permits and loans are in place and is typically the event that triggers expenditure on construction and materials and equipment procurement. Thus, it is the key event in monitoring when a decision is made to proceed with a private infrastructure project. Before financial closure, negotiation is still taking place. After financial closure, disbursement is simply the enactment of the agreements that came together at financial closure. Where divestitures and new investments are phased and data were available at financial closure, they are recorded in phases.

It is important to note that financial closure is not the same as disbursement. Thus, while trends in value at financial closure (VFC) of projects with foreign participation give an idea of the trends of foreign investment in the electricity sector, VFC does not exactly equate to foreign investment in the national income accounting sense for two reasons. First, actual expenditure may be more or less than the amount recorded at financial closure because costs of engineering, procurement and construction are highly uncertain. Also, not all projects that reach financial closure are completed. Second, VFC is a one-time event, in contrast to disbursement (investment in capital facilities), which is a flow of expenditure that takes place over the course of the several years necessary to construct and equip a project.

Description of Files

Original PPI Database Files

Inasmuch as our interest is in energy in general and electricity in particular, we obtained only those elements of the PPI database.

1. Electricity and Gas by Country and Project. This is the original PPI database file transmitted by the World Bank. It includes fields for year, region, country, subsector, project name, project type (e.g. divestiture, Greenfield, etc.), additional investment, divestiture investment, initial cost, total cost and capacity quantity.
2. Electricity Supplement. This is also a file provided by the World Bank, focused on electricity only. Like *Electricity and Gas by Country and Project,* it includes fields for year, region, country, subsector, project name, project type. Also, it includes transaction type (e.g. partial divestiture, BOT, etc.), subsector segment (distribution, transmission and generation), parent company name, percent private, financial closure date, technology (e.g. combined cycle, hydro, etc.). However, it does not include data on additional investment, divestiture investment, initial cost, total cost and capacity quantity.
3. Gas Supplement. This has the same contents as *Electricity Supplement* but for natural gas.

Greenfield IPP Files

- Asia Complete IPP File. This file combines the data for *Electricity and Gas by Country and Project* and *Electricity Supplement* for South Asia and for East Asia and the Pacific, for greenfield projects and O&M projects with major private investment. This file has two sub-files: *All Projects* and *Foreign Projects,* which comprises only those projects that clearly have foreign participation.

  The editing necessary to construct this file is and the foreign projects sub-file is described below.

- Latin America Complete IPP File. The contents of this file are similar to those of the *Asia Complete IPP File.* It covers the Caribbean as well as continental countries south of the U.S.
- Middle East and North Africa Complete IPP File. The contents of this file are similar to those of the *Asia Complete IPP File*.
- Africa Complete IPP File. This comprises Africa south of the Sahara, and its contents are similar to those of the *Asia Complete IPP File.*
- Europe and Central Asia. The contents of this file are similar to those of the *Asia Complete IPP File*.

Creating the Foreign Greenfield IPP Files

Common data in *Electricity and Gas by Country and Project* (EGCP) and *Electricity Supplement* (ES) are year, region, country, class name (type of transaction) and project name. There is no other overlap between the two files. Thus, it was first necessary to sort the two files in such a way that they could be merged.

EGCP is organized by year, region and country. ES is organized by segment, region, country and date. The following sorting steps were undertaken to make them into a common file:

- ES was sorted so that it contained only generation. It was then sorted by transaction type so that it included only greenfield projects and O&M projects with major private capital expenditure.
- EGCP was first sorted to separate electricity and natural gas.
- The electricity portion of EGCP was sorted by region and country. It was then sorted by transaction type so that divestiture and simple management and operations projects were sorted out. The remaining file included only greenfield projects and O&M projects with major private capital expenditure. However, it still contained transmission and distribution projects.
- The two sorted files were merged into a transitional file and transmission and distribution projects were sorted out by manually matching project names (which were common to both files). This left a file that included only generation projects, both greenfield and O&M with major capital expenditure.
- This transitional file was divided by region, leaving for each region a *(Region) Complete IPP File, All Projects.*

The next step in editing the files was to create the *Foreign Projects* sub-files. Using the ownership data in the *Complete IPP Files,* we first used knowledge of IPP developers based on experience to identify those projects whose "parents" clearly indicated foreign participation. Also, it was clear that some projects had only local participation, e.g. Tata Enterprises in India or "small local developers" in several projects. These were eliminated from the *Foreign Projects* sub-files. Also eliminated were projects that had no identified parents. For those projects whose parentage was not clear, we searched for the parents' names on the Worldwide Web on the assumption that if a firm was big enough and aggressive enough to participate internationally, it would be likely to have a website. If we did not find from the Web that a firm was non-domestic, we eliminated it from the *Foreign Projects* sheets. We believe that the risk of misclassification from the use of this approach is small. Moreover, the number and generating capacity of projects of unknown parentage is relatively small.

The resulting files had remaining some redundant or irrelevant fields. These were eliminated.

Contents of the Files
Each file has the following fields:

- **Country Name**
- **Region Name**
- **Project Name**
- **Yod**: year of data
- **Total $**: value of project at financial closing in $ millions
- **Capacity Quantity**: generating capacity in MW
- **Class Name**: greenfield or O&M with major private capital expenditure
- **Class Type:** BOT, Merchant, etc.
- **Parent Name**
- **Percent Private**
- **Closure Date**
- **Technology/Fuel**
- **Initial Cost:** in $ millions